

# Awareness of salt consumption in outpatients admitted to the Nephrology clinic

## *Nefroloji kliniğine ayaktan başvuran hastalarda tuz tüketimi farkındalığı*

Davut Akın

Posted date:30.01.2025

Acceptance date:27.03.2025

### Abstract

**Purpose:** Excess salt consumption contributes significantly to the development of kidney disease, hypertension and heart disease and makes their control difficult. The aim of this study was to investigate the daily salt consumption levels and awareness of salt consumption in outpatients attending a nephrology clinic.

**Materials and methods:** This descriptive cross-sectional study was conducted between January 10, 2024 and March 10, 2024. Data were collected from individuals aged 18 years and older who were admitted to Pamukkale University Nephrology clinic as outpatients and who agreed to participate in the study by face-to-face questionnaire method. The Beliefs about Dietary Compliance Scale was used to assess salt consumption habits.

**Results:** The mean age of the 211 patients who participated in the study was 58.94±16.84 years. It was determined that 82.5% (n=174) of the participants knew the recommended daily salt amount as 5 grams and 66.8% of them consumed their meals with little or no salt. Salt was mostly consumed as table salt (63.3% n=133), followed by natural salt found in foods (30.3% n=64) and least from prepared foods (6.6% n=14). The mean score of the benefit subscale was 29.3±2.7 and the mean score of the barrier subscale was 19.4±4.2.

**Conclusion:** A large proportion (82.5%) of the patients admitted to the Nephrology Clinic as outpatients stated that they were aware of and complied with the daily salt consumption of 5 gr recommended by the guidelines. However, this awareness does not result in a sufficient behavioral change in daily life.

**Keywords:** Kidney diseases, hypertension, amount of salt in the diet, salt intake.

Akın D. Awareness of salt consumption in outpatients admitted to the Nephrology clinic. Pam Med J 2025;18:398-405.

### Öz

**Amaç:** Fazla tuz tüketimi, böbrek hastalığı, hipertansiyon ve kalp hastalığı gelişimine önemli ölçüde katkıda bulunur ve bunların kontrolünü zorlaştırır. Bu çalışmanın amacı, nefroloji kliniğine ayaktan başvuran hastaların günlük tuz tüketim düzeylerini ve tuz tüketimi konusundaki farkındalıklarını araştırmaktır.

**Gereç ve yöntem:** Çalışma tanımlayıcı kesitsel tipte olup 10 Ocak 2024 ile 10 Mart 2024 tarihleri arasında Pamukkale Üniversitesi Nefroloji kliniğine ayaktan başvuran, 18 yaş ve üzeri, çalışmaya katılmayı kabul eden bireylerden veriler, yüz yüze gerçekleştirilen anket yöntemiyle toplanmıştır. Tuz tüketim alışkanlıklarını değerlendirmek için Diyet Uyumuna İlişkin İnançlar Ölçeği kullanılmıştır.

**Bulgular:** Çalışmaya katılan 211 hastanın yaş ortalaması 58,94±16,84'tür. Katılımcıların %82,5'inin (n=174) önerilen günlük tuz miktarını 5 gram olarak bildiği ve %66,8'inin yemeklerini az tuzlu ya da tuzsuz olarak tükettiği belirlenmiştir. Tuz, en fazla sofraya tuzu (%63,3, n=133) olarak tüketilirken, bunu gıdalarda doğal olarak bulunan tuz (%30,3, n=64) ve en az hazır gıdalardaki tuz (%6,6, n=14) takip etmiştir. Diyet Uyum Hakkındaki İnançlar Ölçeği yarar alt ölçeğinin ortalama puanı 29,3±2,7 ve engel alt ölçeğinin ortalama puanı 19,4±4,2'dir.

**Sonuç:** Nefroloji kliniğine ayaktan başvuran hastaların büyük bir kısmı (%82,5) kılavuzlarda önerilen günlük 5 gr tuz tüketiminin farkında olduklarını ve buna uyduklarını belirtmiştir. Ancak bu farkındalık günlük yaşamda yeterli bir davranış değişikliğine yol açmamaktadır.

**Anahtar kelimeler:** Tuz alımı değişikliği, böbrek hastalıkları, hipertansiyon, diyetle tuz miktarı.

Akın D. Nefroloji kliniğine ayaktan başvuran hastalarda tuz tüketimi farkındalığı. Pam Tıp Derg 2025;18:398-405.

Davut Akın, Assoc. Prof. Pamukkale University Faculty of Medicine, Department of Internal Medicine, Denizli, Türkiye, e-mail: dakin@pau.edu.tr (https://orcid.org/0000-0002-9567-7940) (Corresponding)

## Introduction

Current international guidelines for the treatment of kidney disease recommend dietary and lifestyle modifications to delay progression and reduce disease-specific mortality in addition to standard chronic kidney disease (CKD) therapy [1]. Reducing dietary sodium intake is considered an important treatment modality in the management of patients with kidney disease, hypertension, and heart disease. Although there are intercontinental and regional differences in the world, the average sodium consumption among adults in Türkiye is approximately 18 g per day [2], which is more than three times the amount recommended by the World Health Organization. Regarding salt consumption, guidelines recommend a dietary intake of less than 5 g per day of sodium chloride (NaCl), commonly known as table salt, which is equivalent to 2 g of sodium (Na<sup>+</sup>) [3, 4]. The rationale behind this recommendation is based on observations that salt restriction in CKD patients reduces blood pressure (BP) and proteinuria [5, 6], two key factors for CKD progression. Salt restriction also prevents glomerular hyperfiltration and potentiates the renoprotective response to RAS-i [7]. Recognizing that many developed and developing countries share this scenario and that reducing dietary sodium intake would have a significant impact on hypertension, cardiovascular disease, and kidney disease, the World Health Organization (WHO) has requested that food companies reduce the sodium content in their products and that governments introduce regulatory approaches if recommended sodium intake levels cannot be achieved through voluntary actions.

In this study, we aimed to determine the nutritional habits of outpatients applying to the nephrology outpatient clinic, their level of knowledge about how much salt they consume per day, how much salt they should consume, how much they adapt what they know to their daily life, where they get the salt they consume, whether they pay attention to the amount of salt in the foods they take from outside, the effects of salt on their health, their level of knowledge, and their awareness.

## Materials and methods

The study is a descriptive cross-sectional study. It consisted of patients who were 18 years of age or older, literate, able to read and write, and capable of understanding and accepting the questionnaire. These patients applied to the Pamukkale University Nephrology outpatient clinic between January 10, 2024, and March 10, 2024. Prior to the study, approval was obtained from the Pamukkale University Faculty of Medicine Non-Interventional Clinical Research Ethics Committee with the board decision dated January 9, 2023, and numbered E-60116787-020-474865. A questionnaire form was administered to the patients included in the study through a face-to-face interview technique.

In the questionnaire form, age, gender, educational status, place of residence, smoking status, having a disease other than kidney disease, reason for applying to the nephrology clinic, dialysis, kidney transplantation status, family history of kidney disease, amount of salt that should be consumed daily, how you consume your meals, where you eat, adding salt to food, The following questions were asked: the use of salt shaker at the dinner table, the type of salt used, where he/she gets salt from the most, eating salt-free in social settings, requesting coloring according to the amount of salt in the menu in the restaurant, checking the label for the amount of salt, the effect of having color-based labels on the amount of salt in foods on food selection, and how he/she cooked the food. In addition, the Beliefs about Dietary Compliance Scale (BDACS) was used to assess salt consumption habits.

Beliefs about Dietary Compliance Scale (BDACS): This scale, which was developed by Bennett et al. [8] and validity and reliability study was conducted by Oğuz et al. [9] in 2010, consists of 12 questions and two sub-dimensions: benefits (items 1-5, 11, 12) and barriers (items 6-10). Item 2 has a reverse coding. The possible score in the benefit sub-dimension ranges between 7-35 and in the barrier sub-dimension between 5-25. A high score in the benefit subscale indicates that the perceived benefit in compliance with the diet based on salt restriction is high, while a high score in the barrier subscale indicates that the

perceived barriers in compliance with the diet are high. In the study conducted by Oğuz et al. [9] in heart failure patients, Cronbach's alpha was 0.71 for the benefit subscale and 0.58 for the barrier subscale. Similarly, in this study, Cronbach's alpha for the benefit subscale was 0.61 and 0.68 for the barrier subscale.

Data were analysed using IBM SPSS Statistics 25 (Armonk, NY: IBM Corp.) software. Descriptive statistics were given as number and percentage for categorical variables, arithmetic mean and standard deviation for continuous variables. Kolmogorov Smirnov and Shapiro-Wilk tests were performed to evaluate normal distribution. Kruskal-Wallis Analysis of Variance and Mann-Whitney U test were used to evaluate the differences between the groups. A  $p$  value  $<0.05$  was accepted as a statistically significant result.

## Results

The study included 211 patients. The mean age of the participants was  $58.94 \pm 16.84$  (min: 19 max: 92) and 53.7% were female. Hypertension 64.5% ( $n=136$ ), diabetes 31.3% ( $n=66$ ), hyperlipidemia 15.6% ( $n=33$ ), heart disease 19.9% ( $n=42$ ), rheumatologic disease 10.4% ( $n=22$ ) and cancer diagnosis 6.6% ( $n=14$ ) (Table 1).

It was determined that 82.5% ( $n=174$ ) of the participants knew the recommended daily salt amount to be 5 grams and 66.8% of them consumed their meals with little or no salt. 94.8% ( $n=200$ ) of the participants consumed their meals at home and 5.2% ( $n=11$ ) consumed their meals outside. Salt was mostly consumed as table salt (63.3%  $n=133$ ), followed by natural salt found in foods (30.3%  $n=64$ ) and least from prepared foods (6.6%  $n=14$ ). 82.9% ( $n=175$ ) of the participants stated that color-based labels indicating the salt content of foods according to their grade could influence their food preferences. In contrast, 17.1% ( $n=36$ ) of the participants stated that such labels would not have any effect on food choices (Table 2).

The mean score of the benefit subscale of the dietary adaptation scale was  $29.3 \pm 2.7$  (min: 11 max: 32) and the mean score of the barrier subscale was  $19.4 \pm 4.2$  (min: 5 max: 25). There was no difference between the mean scores of the benefit and barrier subscales of the BDCS in terms of gender, but the mean score of the benefit subscale was significantly higher in married participants compared to single participants ( $p=0.427$ ;  $p=0.653$ ,  $p=0.003$ , respectively). Table 3 shows the comparisons of some variables of the participants with the benefit and barrier subscales of the BDCS.

**Table 1.** Demographic features of the participants

	n	%
<b>Gender</b>		
Woman	121	57.3
Male	90	42.7
<b>Marital status</b>		
Married	166	78.7
Single	45	21.3
<b>Education status</b>		
Primary education	123	58.3
High school	40	19.0
University/ Master's degree	48	22.7
<b>Place of residence</b>		
Rural	87	41.2
Urban	124	58.8

**Table 1.** Demographic features of the participants (continued)

	n	%
<b>Smoking status</b>		
Yes	51	24.2
No	160	75.8
<b>Chronic disease status other than kidney disease</b>		
Yes	176	83.4
No	35	16.6
<b>Complaint of presentation to the nephrology outpatient clinic</b>		
Kidney disease	44	20.9
Protein leakage	19	9.0
Kidney stone	9	4.3
Kidney disease	47	22.2
Nephrological disease control	92	43.6
<b>Patient receiving dialysis</b>		
Yes	11	5.2
No	200	94.8
<b>Kidney transplant patient</b>		
Yes	1	0.5
No	210	99.5
<b>Kidney disease in the family</b>		
Yes	62	29.4
No	149	70.6

**Table 2.** Characteristics of participants salt use

	n	%
<b>The amount of salt to be consumed daily</b>		
5 g (~1 teaspoon silica)	174	82.5
15 gr	29	13.7
20 gr	7	3.3
50 g and above	1	0.5
<b>How you consume your meals</b>		
No Salt	62	29.4
Lightly salted	79	37.4
Normal salty	60	28.4
Salty	10	4.7
<b>Do you add salt by tasting the food?</b>		
Yes	143	64.9
No	68	32.2

**Table 2.** Characteristics of participants salt use (continued)

	n	%
<b>Do you use a salt shaker at the dinner table?</b>		
I use it all the time	20	9.5
I use it most of the time	28	13.3
Sometimes I use it	41	19.4
I rarely use it	39	18.5
I never use it	83	39.3
<b>Salt type</b>		
Table salt	163	77.3
Sea salt	7	3.3
Rock salt	26	12.3
Himalayan salt	7	3.3
Lodized salt	8	3.8
<b>Do you try to eat salt-free in social situations?</b>		
Always	58	27.5
Mostly	31	14.7
Sometimes	38	18.0
Rarely	42	19.9
Never.	42	19.9
<b>Would you like the menu in a restaurant to be colored according to the amount of salt?</b>		
Yes	179	84.8
No	32	15.2
<b>Can you check the label for the amount of salt?</b>		
Always	72	34.1
Mostly	32	15.2
Sometimes	36	17.1
Rarely	24	11.4
Never	47	22.3
<b>How do you cook your food?</b>		
*I cook salty and don't add salt at the table	70	33.2
*I use tomato paste with high salt content while cooking and do not add salt at the table	75	35.5
*I cook with salt and add salt at the table	12	5.7
*I cook without salt and I don't add salt at the table	54	25.6

**Table 3.** Comparison of Beliefs about Dietary Compliance Scale with some variables of the participants

Variables	Benefit score	Test value	Barrier score	Test value
	A.M±SD	p	A.M±SD	p
<b>Gender</b>				
Woman	29.1±3.0	Z=-.795	19.2±4.7	Z=-.449
Male	29.6±2.3	p=0.427	19.7±3.5	p=0.653
<b>Education status</b>				
Primary Education (1)	29.8±2.0	kwh=8.417	19.9±3.9	kwh=3.316
High School (2)	29.5±2.4	p=0.015	18.9±4.2	p=0.191
University (3)	28.1±4.0	(1-3)	18.6±4.9	
<b>Marital status</b>				
Married	29.7±2.0	Z=-3.007	19.5±4.1	Z=-.135
Single	27.9±4.2	p=0.003	19.2±4.9	p=0.893
<b>Smoking status</b>				
Yes	29.1±3.6	Z=-0.299	18.9±4.4	Z=-0.913
No	29.4±2.4	p=0.765	19.6±4.2	p=0.361
<b>Place of residence</b>				
Rural area	29.5±2.2	Z=-.154	19.2±4.4	Z=-.494
City center	29.2±3.1	p=0.878	19.5±4.1	p=0.621
<b>Additional Chronic disease</b>				
Yes	29.5±2.7	Z=-2.057	19.4±4.2	Z=-.295
No	28.6±2.9	p=0.040	19.5±4.7	p=0.768
<b>Dialysis</b>				
Yes	29.6±2.0	Z=-0.030	19.9±3.6	Z=-0.184
No	29.3±2.8	p=0.976	19.4±4.3	p=0.854
<b>Kidney disease in the family</b>				
Yes	29.3±3.4	Z=-0.324	18.5±4.0	Z=-1.766
No	29.3±2.4	p=0.746	19.8±4.3	p=0.077

AM: Arithmetic mean, SD: Standard deviation, Z: Mann Whitney U test, kwh: Kruskal Wallis Analysis of Variance; \*p<0.05

## Discussion

In this study, it was observed that the majority (82.5%) of the outpatients admitted to the nephrology outpatient clinic were aware of and complied with the salt consumption of 5 g/day recommended by WHO and nephrology guidelines. In the study, 66.8% of the participants consumed unsalted and low-salt foods. This is considerably below the 18 g/day salt consumption in the general population in the SALTÜRK study conducted in Türkiye in 2010 [2]. The possible reason for this may be that the awareness of patients applying to the

nephrology outpatient clinic is higher, and the awareness of salt consumption has increased over the years. This study shows that awareness of salt consumption is generally high, but this awareness does not translate into sufficient behavioral change in practice.

In this study, the mean score of the benefit subscale of the BDCS was 29.3±2.7 and the mean score of the barrier subscale was 19.4±4.2. In a study conducted on hypertension patients, the benefit subscale of the BDCS was found to be 23.44±5.50 and the barrier subscale of the BDCS was found to be 12.9±3.59 [10].

Similarly, in a study conducted in hypertension patients, the mean of the benefit sub-dimension of the BDCS was found to be  $27.42 \pm 3.95$  and the barrier sub-dimension of the BDCS was found to be  $11.82 \pm 4.82$  [11]. In a study conducted on renal patients undergoing regular hemodialysis in a dialysis center, the mean scores of the benefit subscale were found to be  $26.71 \pm 5.78$  and the mean scores of the barrier subscale were found to be  $14.59 \pm 3.65$  [12]. In this study, the mean scores related to the benefit and barrier subscales of the BDCS were found to be higher than the studies in the literature. This difference may be due to the differences in the awareness and attitude levels of the participants towards salt restriction and the clinical characteristics of the study group. In addition, this suggests that perceptions and barriers to salt restriction may vary in different patient groups or in the presence of comorbidities.

In contrast to the results of Oğuz et al. [10] and Zengin and Oren [12], who did not observe a significant difference in marital status, our study indicates that married individuals scored significantly higher on the benefit subscale. In married individuals, elevated "benefit" subscale scores may stem from factors such as spousal/familial support, ease of meal preparation and sharing at home, and a heightened sense of health responsibility. Such family support can enhance dietary adherence by offering both motivational and practical assistance.

In conclusion, it can be said that outpatients attending the nephrology clinic are aware of the 5 grams of salt consumption per day recommended by nephrology guidelines and WHO to slow the progression of diseases and to control them. However, although awareness of salt consumption is generally high, it is observed that this awareness is not sufficiently transformed into behavioral change.

**Acknowledgment:** I would like to thank my Special Study Module students Semiha Boyaci, Suheda Cavda, Mevlude Doke, and Sude Nur Kalkan for their contributions to the article.

**Funding:** None.

**Conflict of interest:** No conflict of interest was declared by the author.

## References

1. Stevens PE, Levin A. Kidney Disease: Improving Global Outcomes Chronic Kidney Disease Guideline Development Work Group Members. Evaluation and management of chronic kidney disease: synopsis of the kidney disease: improving global outcomes 2012 clinical practice guideline. *Ann Intern Med.* 2013;158(11):825-830. doi:10.7326/0003-4819-158-11-201306040-00007
2. Erdem Y, Arici M, Altun B, et al. The relationship between hypertension and salt intake in Turkish population: SALTURK study. *Blood Press.* 2010;19(5):313-318. doi:10.3109/08037051003802541
3. Diet, nutrition and the prevention of chronic diseases. *World Health Organ Tech Rep Ser.* 2003;916. Available at: [https://iris.who.int/bitstream/handle/10665/42665/WHO\\_TRS\\_916.pdf](https://iris.who.int/bitstream/handle/10665/42665/WHO_TRS_916.pdf). Accessed 31.01.2025
4. Levin A, Stevens P. Kidney Disease: Improving Global Outcomes (KDIGO) CKD Work Group. KDIGO 2012 clinical practice guideline for the evaluation and management of chronic kidney disease. *Kidney Int Suppl.* 2013;3:1-150. doi:10.1038/kisup.2012.73
5. McMahon EJ, Campbell KL, Bauer JD, Mudge DW. Altered dietary salt intake for people with chronic kidney disease. *Cochrane Database Syst Rev.* 2015;(2):CD010070. Published 2015 Feb 18. doi:10.1002/14651858.CD010070
6. Vogt L, Waanders F, Boomsma F, de Zeeuw D, Navis G. Effects of dietary sodium and hydrochlorothiazide on the antiproteinuric efficacy of losartan. *J Am Soc Nephrol.* 2008;19(5):999-1007. doi:10.1681/ASN.2007060693
7. D'Elia L, Rossi G, Schiano di Cola M, Savino I, Galletti F, Strazzullo P. Meta-Analysis of the Effect of Dietary Sodium Restriction with or without Concomitant Renin-Angiotensin-Aldosterone System-Inhibiting Treatment on Albuminuria. *Clin J Am Soc Nephrol.* 2015;10(9):1542-1552. doi:10.2215/CJN.09110914
8. Bennett SJ, Milgrom LB, Champion V, Huster GA. Beliefs about medication and dietary compliance in people with heart failure: an instrument development study. *Heart Lung.* 1997;26(4):273-279. doi:10.1016/s0147-9563(97)90084-4
9. Oğuz S, Enç N, Yiğit Z. Kronik kalp yetersizliği olan hastalar için inanç ve uyum ölçeklerinin Türkçeye uyarlanması. *Türk Kardiyol Dern Arş.* 2010;38(7):480-485.
10. Oğuz S, Yanmış S, Yılmaz B, Atman R. Hipertansiyon hastalarının ilaç ve diyet tedavisine uyum düzeyleri. *Kardiyovasküler Hemşirelik Dergisi.* 2019;10(21):1-7. doi:10.5543/khd.2019.63644

11. Oğuz S, Yetim M, Yalçın Ö, Ünalan YE, Çamcı G. Hipertansiyonlu bireylerde hastalık algısının tedavi ve diyet uyumuna etkisi. *Cumhuriyet Hemşirelik Dergisi*. 2017;5(2):75-83.
12. Zengin N, Ören B. Hemodiyaliz hastalarının tuzdan kısıtlı diyet uyumlarının incelenmesi. *Nefroloji Hemşireliği Dergisi*. 2015;10(2):39-49.