

Comparison of The Salt Consumption Habits and Knowledge of The 1st Year and 6th Year Medical Faculty Students

Tıp Fakültesi 1. Sınıf ve 6. Sınıf Öğrencilerinin Tuz Tüketim Alışkanlıkları Ve Bilgi Düzeylerinin Karşılaştırılması

Samet Yılmaz¹, Gülse Demirkol², Rabiye Çam², Beste Kılıç², Nevval Tanrıverdi², Bedirhan Bozkurt Çimen¹

1 Kardiyoloji Kliniği, Pamukkale Üniversitesi Hastanesi, Pamukkale, Denizli/Türkiye

2 Tıp Fakültesi, Pamukkale Üniversitesi, Pamukkale, Denizli/Türkiye

ÖZET

AMAÇ: Dünya sağlık örgütü günlük en fazla 5 gram tuz tüketilmesi gerektiğini belirtmektedir. Ancak hem ülkemizde hem de dünyada günlük tüketilen tuz miktarı bu rakamın çok üzerindedir. Bizim bu çalışmadaki amacımız tıp fakültesine yeni başlamış 1. sınıf öğrencileri ile tıp fakültesinde 6. sınıfa gelmiş öğrencilerin tuz tüketimi hakkındaki bilgi düzeylerini ve alışkanlıklarını karşılaştırmaktır.

GEREÇ VE YÖNTEM: Toplam 279 katılımcıya yüz yüze sorular sorularak bilgiler elde edilmiştir. Çalışmanın bağımlı değişkeni; fakültemizde eğitim gören dönem 1 ve dönem 6 öğrencilerinin tuz tüketimi hakkındaki bilgi, tutum ve davranışları; bağımsız değişkenleri öğrencilerin fiziksel özellikleri, ailenin eğitim düzeyi, kişinin kendisi ve ailesi ile ilgili fazla tuz tüketimine bağlı hastalık geçmişi, sosyo-kültürel düzeyi ve beslenme alışkanlıklarını sorgulayan sorular olmuştur.

BULGULAR: Toplam 279 katılımcının 193 tanesi dönem 1 öğrencisi, 86 tanesi ise dönem 6 öğrencisi idi. Aşırı tuz kullanımının vücuda olan zararlarını bildiklerini söyleyen öğrencilerin oranı dönem 1' de %76 ve dönem 6'da %94 olmasına rağmen restoranlarda tuz kısıtlaması destekleyenlerin oranı sırasıyla %41 ve %65 olarak tespit edildi. Günlük önerilen tuz tüketim miktarını bildiklerini söyleyenlerin oranı sırasıyla %18 ve %48 olarak saptandı. Ancak bildiklerini söyleyenler arasında doğru miktarı bilenlerin oranı sırasıyla %70 iken %75 olarak hesaplandı. Günlük önerilen tuz tüketim miktarına verilen yanıtların ortalaması ise dönem 1 öğrencilerinde 5.7±2.7 g iken dönem 6 öğrencilerinde 4.7±1 g olarak saptandı (p=0.033).

SONUÇ: Sonuç olarak ülkemiz tıp fakültelerinin birinde yapılan bu çalışmada tıp fakültesi öğrencilerinin tuz tüketimi ile ilgili bilinç düzeylerinin 1. sınıftan 6. sınıfa doğru giderken arttığı ancak yine de büyük bir çoğunluğun bu konuda farkındalıklarının az olduğu görülmüştür.

Anahtar Kelimeler: Tuz tüketimi; sodyum alımı; kardiyovasküler risk

ABSTRACT

OBJECTIVE: World Health Organization recommends maximum 5 gr of salt consumption in a single day. However, in our country and all over the World, the salt consumption rate is much more than this value. In this study, our aim was to determine and compare the salt consumption habits and knowledge of 1st year and 6th year medical school students.

MATERIALS AND METHODS: All of the data was gathered from 279 students by face-to-face questionnaire. The dependent variables of the study were knowledge, attitudes and behaviors of students about salt consumption and the independent variables were questions about the physical characteristics, the education levels of their families, medical history of the participants and their families, their socio-cultural levels and nutritional habits.

RESULTS: 193 of the 279 students were 1st year student and 86 of them were 6th year student. Although the proportion of students who said that they knew the harm of excessive salt use to the body was 76% in grade 1 and 94% in grade 6. The proportion of those who supported salt restriction in restaurants was 41% and 65%, respectively. Students who answered that they know the daily salt recommendation were 18% and 48%, however the ratio of the students who knew the correct value was 79% and 75% respectively. The mean average answer given to the daily recommended salt consumption amount was 5.7±2.7 g in the 6th year students and 4.7±1 g in the first year students (p=0.033).

CONCLUSION: As a result, in this study which was conducted in one of the medical faculties of our country, it was observed that the level of consciousness of medical faculty students about salt consumption increased from the 1st grade to the 6th grade, but still, the awareness of the majority of them was low.

Keywords: Salt consumption; sodium intake; cardiovascular risk



INTRODUCTION

Salt, which is a simple chemical compound, is known systematically as sodium chloride; It is one of the most important foods consumed by people for centuries. Salt increases the durability of many foods and prevents them from rotting, thus allowing them to be stored for a long time, and the taste of the food increases with salt (1). In addition, as an important component of our body, it plays important roles in maintaining fluid-electrolyte balance, regulating blood pressure, and maintaining cell and organ functions (2).

The World Health Organization (WHO) recommends that the amount of salt that healthy adults consume should be no more than 5 g/day (3). However, due to today's lifestyle, food storage conditions, changes in eating habits, increased consumption of fast food and the presence of manufactured products on the shelves, the daily amount of salt consumed by people is highly above the WHO recommendation. In cross-sectional studies on salt consumption in many countries of the world, it has been determined that the daily salt consumption amount is up to 42 g per day (4, 5). In the SALTURK (The relationship between hypertension and salt intake in Turkish population) study, which is the most important study in this context conducted in our country, Turkish peoples' daily salt consumption amount was found approximately 18 g (6). This situation increases the risk of getting many diseases such as cardiovascular diseases, obesity, osteoporosis, diabetes and kidney diseases.

For public health policies, determining the amount of salt consumption in a population and knowing the peoples' awareness levels are very important. Since medical faculty students will be the ones who will raise our public awareness on this issue in the future, their level of awareness should increase during their education. For these reasons, our aim in this study was to compare the knowledge levels of Pamukkale University Faculty of Medicine 1st and 6th class students about WHO's salt consumption recommendation and to determine how they regulate their eating habits in this regard.

MATERIAL & METHODS

The population of this cross-sectional study consists of Pamukkale University Faculty of Medicine 1st and 6th grade students. It was planned to include all of the students in this study, however due to some students could not be

reached, only those who were reached were included in the study. Pamukkale University Non-Interventional Clinical Research Ethics Committee approved this study (14.11.2023, E-60116787-020-448906).

Data were collected by asking students face-to-face questionnaire. The dependent variable of the study was knowledge, attitudes and salt consumption habits of the 1st and 6th grade students studying at our faculty. The independent variables were the physical characteristics of the students, the education level of his/her family, the history of diseases related to the student and his/her family due to excessive salt consumption, socio-cultural levels of students and their nutritional habits.

By scanning the literature, a questionnaire form with 30 questions (4 questions about the physical characteristics of the student, 2 questions about the education level of his/her family, 3 questions about the disease history of the student and his/her family, 8 questions about the his/her socio-cultural level, 13 questions about nutritional habits) was created.

The questionnaire was applied by also from medical faculty students determined within the program of Pamukkale University Faculty of Medicine special study module program.

SPSS program (version 22.0, SPSS, Inc., Chicago, IL) was used to analyze the data. Descriptive statistics are written as arithmetic mean \pm standard deviation for continuous variables. Chi-square test was used to compare categorical variables. To determine whether the continuous variables were in normal distribution or not, Kolmogorov-Smirnov test was used. Student-t test of independent groups was used to compare parametric variables while Mann-Whitney U test was used to compare nonparametric variables. A post-hoc power analysis was performed by using G-power program and the post-hoc power of our study was found 99.8%. P value <0.05 was considered statistically significant.

RESULTS

A study questionnaire was asked to a total of 279 participants. 193 of the participants were Class 1 students and 86 were Class 6 students. 151 (54.1%) of the participants were women and 128 (45.9%) were men. Body mass index values of 6th grade students were found to be higher than those of 1st class students ($p=0.049$). Last year students consumed more alcohol and the number of

smokers was significantly higher than first class students. The basic demographic characteristics and social features of the participants are shown in Table 1.

Table 1. Basic demographic and social characteristics of the participants

	Class 1 students (n=193)	Class 6 students (n=86)	p
Age	18.9±1.0	24.1±1.1	<0.001
Male sex (%)	44.6	48.8	0.508
Height (cm)	171±9	173±8	0.112
Weight (kg)	65.1±14.5	69.3±15.3	0.033
Body mass index	21.9±3.5	22.9±3.5	0.049
Alcohol usage			0.017
Never (%)	50.3	32.6	
Sometimes (%)	44.6	62.8	
Regularly (%)	5.2	4.7	
Smoking			<0.001
Yes (%)	13	38.4	
No (%)	84.5	53.5	
Formers (%)	2.6	8.1	

Data are presented by mean ± standard deviation. Student-T-test and Chi-Square was used for analyses. n: number,

Information about the participants' nutritional habits, salt consumption habits and its relationship with diseases is given in Table 2. When "What do you think about the salt content of the foods you consume?" was asked to the students, approximately 65% of both groups replied "normal". However, those who think that they consumes too salty foods are 3 times more likely among 6th grade students compared to 1st grade students (9.3% vs. 3.1%).

Although it was seen that there is no extra salt consumption at the table in both groups, the consumption of fast food was higher in the 6th grade students. Those who said "yes" to the whether there is an existence of a relationship between salt consumption and cardiovascular diseases were statistically more common among 6th grade students (46.5% vs. 22.8%, p<0.001).

76% of Class 1 students and 94% of Class 6 students said that they knew the harms of salt consumption. Despite this, the percentage of those who said that they know the recommended daily salt consumption amount was 18% and 48%, respectively (Table 3). However, ratio of the students who knew the correct amount of WHO's salt consumption

recommendation (5 gr/d) was 70% of above students in both groups.

Table 2. Participants' nutritional habits, salt consumption habits and its relationship with diseases

	Class 1 students (n=193)	Class 6 students (n=86)	p
What do you think about the salt amount of the foods you consume?			0.121
No salty (%)	5.2	2.3	
Low (%)	22.8	23.3	
Normal (%)	68.9	65.1	
High (%)	3.1	9.3	
How often do you eat fast food?			0.007
Never (%)	1.6	4.7	
Sometimes (%)	72	53.5	
Regularly (%)	26.4	41.9	
Do you add salt at the table?			0.648
Yes (%)	19.7	24.4	
No (%)	80.3	75.6	
Do you pay attention to the salt content of packaged foods?	5.7	11.6	0.091
Is there a relationship between salt and cardiovascular diseases?			<0.001
Yes (%)	54.4	89.5	
No (%)	45.6	10.5	
Participant who have a family member with hypertension (%)	22.8	46.5	<0.001
Participant who has a disease related with salt (%)	1.6	1.2	0.799

Data are presented by percentage. Chi-Square was used for analyses.

When students were asked "What is the recommended daily salt consumption amount?", the average of the answers was 5.7±2.7 g in the Class 1 and 4.7±1 g in the Class 6 students (p=0.033) (Figure 1).

Figure 1. Participants' answers to the question "Recommended daily salt consumption amount"

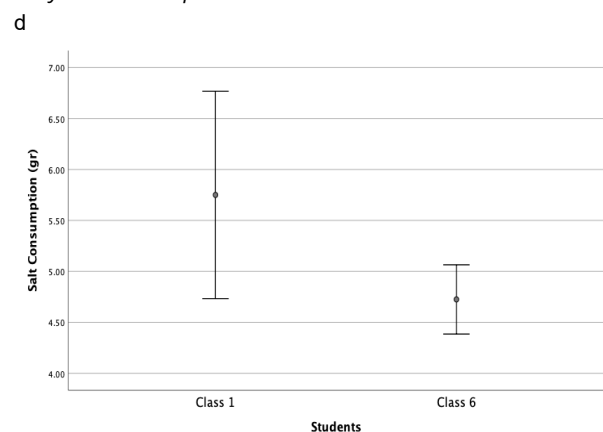


Table 3. Participants' thoughts and knowledge levels on salt consumption

	Class 1 students (n=193)	Class 6 students (n=86)	p
Do you know the harms of salt consumption?			<0.001
Yes (%)	76.2	94.2	
No (%)	23.8	5.8	
Do you support salt restrictions in restaurants?			<0.001
Yes (%)	40.9	65.1	
No (%)	59.1	34.9	
Is there salt awareness in our country?			0.406
Yes (%)	4.7	7	
No (%)	95.3	93	
Do you know the amount of salt recommendation by WHO?			<0.001
Yes (%)	18.7	47.7	
No (%)	81.3	52.3	
What is the amount of salt (gr) consumption recommendation daily?	5.7±2.7	4.7±1	0.033

Data are presented by mean ± standard deviation. Student-T-test and Chi-Square was used for analyses.

DISCUSSION

In this study, which was conducted to determine the knowledge, attitudes and behaviors of Pamukkale University Faculty of Medicine students regarding salt consumption, we found that 18.7% of the Class 1 students and 47.7% of the Class 6 students knew the correct amount of daily recommended salt by WHO. According to this result, medical school education contributes greatly to raising awareness of salt consumption. However, almost half of the students in the final year of medical school did not know the recommendation and this shows us that the importance of the salt consumption is still not fully understood by the students.

Similar to our study, many studies conducted in other countries have found that the maximum daily salt amount recommended by WHO is not known (7–9). This shows that Turkey is in the same situation as many countries in the world in terms of salt consumption awareness. Similar to our study, a study was conducted on the daily amount of salt consumed by medical school students in Angola, an African country, in 2015 (10). Students were selected as a random sample from each semester and the amount of sodium (Na) in the 24-hour urine was determined. According to the results of urine analysis, the students'

average daily salt consumption was 14 g. Looking at the answers given by the students to the survey questions, it was determined that 99% of them knew the harms of salt consumption and 45% of them aimed to reduce their salt consumption by not adding extra salt at the table. However, since our study plan was to directly compare students who have just started medical school with students in their final year, it is acceptable that the knowledge level of first-year students may be low. However, the fact that students in the 6th grade still suffer from the lack of knowledge. This situation clearly demonstrates the necessity of eliminating the knowledge gap on this subject.

According to WHO data, salt consumption ways also change with the development levels of countries. For example, while fast foods and packaged products are the most important sources of salt in America and Scandinavian countries, salt added while cooking is the main source of consumption in many countries in Asia and Africa (11-13). In the SALTurK-2 study conducted in our country, the main source of salt was bread and the salt added while cooking (14). As a result of our study, when we compared the students' eating habits, it was determined that those who ate occasionally fast-food were 72% in Class 1 and 53.5% in Class 6 students. This percentage difference may be due to the fact that 6th grade students spend more time in the hospital and work more intensively.

The percentage of awareness about cardiovascular diseases caused by excessive salt consumption was 54.4% in Class 1 students and 89.5% in Class 6 students. As the level of education and the level of knowledge about medicine increased, effect of salt consumption in human body and its relation with diseases is well known.

According to the SALTurk study conducted in Turkey, the average daily salt intake of men was found to be higher than women (6, 14). The reason for this difference between genders may be due to differences in nutritional habits between men and women, such as men consuming more fast foods, having less habit of cooking at home, and preferring consumption outside the home. Likewise, the living conditions of the students, living apart from their families, inadequate cooking habits and turning to fast food consumption were important factors that affected the results of our study.

Our study has some limitations. First, this study was conducted in a single center with cross-sectional design, so

it does not represent the entire universe. Second, our study population consists of medical faculty students, so we cannot generalize it to other populations. Since each student does not have the same accommodation and food opportunities, their eating habits and salt consumption habits may differ. Third, the amount of salt consumption was not calculated objectively by looking at the salt excretion in the urine or the salt amount of the foods. Salt consumption habits are based solely on self-reports so they cannot be the actual amount of salt.

CONCLUSION

As a result, in this study which was conducted in one of the our medical faculties, it was observed that the awareness level of medical faculty students regarding salt consumption increased from the 1st grade to the 6th grade, but still the majority of them had low knowledge on this issue.

Etik: Çalışmanın geriye dönük olması dolayısıyla hastaların dosyaları taranmasında kurum izni alınmış olup, hastalardan ayrıca izin alınmamıştır. Çalışmaya dâhil edilen tüm hastalarda çalışma öncesinde yapılmış olan cerrahi işlem için bilgilendirilmiş onamformu alınmış olup hastane arşivindeki dosyalarında mevcuttur.

Since the study was retrospective, institutional permission was obtained for reviewing the files of the patients and no further permission was obtained from the patients. Informed consent form was obtained for the surgical procedure performed before the study in all patients included in the study and is available in their files in the hospital archive.

Yazar katkı durumu; Çalışmanın konsepti; SY, GD, RÇ, BK, NT, BBÇ, dizaynı; SY, GD, RÇ, BK, NT, BBÇ, Literatür taraması; SY, GD, RÇ, BK, NT, BBÇ, verilerin toplanması ve işlenmesi; SY, GD, RÇ, BK, NT, BBÇ, istatistik; SY, GD, RÇ, BK, NT, BBÇ, yazım aşaması; SY, GD, RÇ, BK, NT, BBÇ.

Author contribution status; The concept of the study; SY, GD, RÇ, BK, NT, BBÇ, design; SY, GD, RÇ, BK, NT, BBÇ, literature review; SY, GD, RÇ, BK, NT, BBÇ, collecting and processing data; SY, GD, RÇ, BK, NT, BBÇ, statistics; SY, GD, RÇ, BK, NT, BBÇ, writing phase; SY, GD, RÇ, BK, NT, BBÇ.

Yazarlar arasında çıkar çatışması yoktur.

The author declares no conflict of interest.

Finansal Destek: yoktur / Funding: none

doi: <https://doi.org/10.33713/egetbd.1398058>

REFERENCES

1. Hutton T. Sodium: Technological functions of salt in the manufacturing of food and drink products. *British Food Journal*. 2002; 104: 126-152.
2. Patel N, Patel D, Farouk SS, Rein JL. Salt and Water: A Review of Hyponatremia. *Adv Kidney Dis Health*. 2023; 30: 102-109.
3. www.who.int
4. Mozaffarian D, Fahimi S, Singh GM et al. Global sodium consumption and death from cardiovascular causes. *N Engl J Med*. 2014; 371: 624-634.
5. Öztürk Rİ, Garipağaoğlu M. Tuz tüketimi ve sağlık. *Türkiye Klinikleri J Health Sci*. 2018; 3: 57-65.
6. Yunus E, Arıcı M, Altun B et al. The relationship between hypertension and salt intake in Turkish population: SALTURK study. *Blood Press*. 2010; 19: 313-318.
7. Celik I, Bektas M. An Assessment of Turkish Adults' Knowledge Levels About Their Salt and Sugar Consumption, and Their Attitudes Toward Protecting Children from Excessive Salt and Sugar Consumption. *J Pediatr Nurs*. 2020; 54: e17-e22.
8. Zhang J, Xu AQ, Ma JX et al. Dietary sodium intake: Knowledge, attitudes and practices in Shandong province China 2011. *PLoS One*. 2013; 8: e58973.
9. Haji Yusuf, Abdurahmen J, Paulos W. Knowledge and Perception of Consumption of Iodized Salt Among Food Handlers in Southern Ethiopia. *Food Nutr Bull*. 2017; 38: 92-102.
10. Land MA, Webster J, Christoforou A et al. The association of knowledge, attitudes and behaviours related to salt with 24-h urinary sodium excretion. *Int J Behav Nutr Phys*. 2014; 11: 47.
11. Magalhães P, Sanhangala EJ, Dombele IM, Ulundo HS, Cappingana DP, Silva AB. Knowledge, attitude and behaviour regarding dietary salt intake among medical students in Angola. *Cardiovasc J Afr*. 2015; 26: 57-62.
12. Marakis G, Tsigarida E, Mila S, Panagiotakos DB. Knowledge, attitudes and behaviour of Greek adults towards salt consumption: A Hellenic food authority project. *Public Health Nutr*. 2014; 17: 1877-1893.
13. WHO. Reducing salt intake in populations. WHO forum and technical meeting proceedings. 5-7 Ekim 2006, Paris, France.
14. Erdem Y, Akpolat T, Derici Ü et al. Dietary Sources of High Sodium Intake in Turkey: SALTURK II. *Nutrients*. 2017; 9: 933.