

# Study on Eating Habits and Physical Activity Status in Turkey

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**Abstract:** The present study aimed to evaluate eating habits and physical activity status of Turkish population, and to determine nutritional changes. This study was conducted in 12 provinces of 11 regions of NUTS level 1 via a face-to-face interview using a pre-prepared questionnaire and included 1536 subjects aged >15 years with different socioeconomic statuses who eat out at least once in a month.

Of the subjects, 33.6% were overweight, 18.4% were obese and 48% had normal weight.

BMI	%
Overweight	33.6%
Obese	18.4%
Normal Weight	48.0%

The rates of subjects calculating calorie intake (8.4%) and reading nutrition facts label (29.1%) were increased with increasing BMI.

The most frequently consumed foods were bread, cheese and olive at breakfast, bread, soup, salad, yoghurt, and pilaf at lunch and toast, sandwiches, and Turkish bagels at snacks.

Breakfast	Average(Monthly)
Bread	25.8
Cheese	25.0
Olive	22.8

Lunch	Average(Monthly)
Bread	26.1
Salad	17.7
Soup	16.4
Yoghurt	10.4
Pilaf	9.6

Snack	%
Toast	33.4
Turkish Bagels	26.3
Sandwiches	25.8

The mean duration of meals was <30 min in 85.8% of the subjects.

Duration Of Meals	%
0-15 minutes	22.7
16-30 minutes	63.3
30 minutes and more	14.1

The most commonly consumed non-alcoholic beverages were tea (95.7%), coffee (58.7%), Turkish yoghurt drink (56.1%), and carbonated beverages (48.3%). Milk consumption was low (20.2%).

Non-alcoholic Beverages	%
Tea	95.7%
Coffee	58.7%
Turkish Yoghurt Drink	56.1%
Carbonated Beverages	48.3%
Milk	20.2%

Alcohol consumption rate was 26.6%. The rate of subjects doing sports was 14.8%, which decreased with increasing age and BMI. In Turkish population, eating habits continued to be traditional, eating awareness and the rate of sport activities were very low.

**Keywords:** Nutrition, physical activity, obesity.

## INTRODUCTION

Turkey with its surface area of 827.000 km<sup>2</sup> is divided into 81 provinces and has a total population of approximately 75 million. Of the population, 76.8% (51 million) live in urban areas and 23.2% (17.4 million) live in rural areas [1]. The Turkish population is a young and dynamic population, of which 25.3% is below 15 years (18 million) and 7.3% (5.5 million) is above 65 years. With an established eating habits and cuisine culture that are based on the centuries, does Turkish population have wrong and unhealthy eating habits as it is commonly considered [2]. Turkey, i.e. Anatolia, has served as a bridge for people moving from central Asia to Europe and is a peninsula, with history of wars, invasion, paucity, and hunger.

During the rulership of the Ottoman Empire that lasted for 600 years, a minority fed well while the others living outside of Istanbul and in rural regions had poor nutrition; maternal and neonatal mortality rates were high. From the First World War until the 10<sup>th</sup> year of the proclamation of the Turkish republic (1933), Anatolia was in reduced circumstances and in the process of reconstruction; therefore, nutrition was poor, nutritional disorders were common and child mortality was very often.

The Turkish cuisine culture has been shaped by Anatolian settlement dating back to 1000 years, with reflection from the cuisines of Central Asia, the Seljuk Empire and the Ottoman Empire. Despite great changes, local eating and cuisine habits are still continued [3]. Turkey has a particular place with its eating habits and the richness of Turkish cuisine. With its mouth-pleasing satisfying characteristics, the Turkish cuisine used to be mostly consisted of cereal

and dried vegetables together with oil; however, shift to Mediterranean cuisine consisting of olive oil, fresh vegetables, fruits, and sea products has showed increase mostly in West Anatolian and Marmara regions [4-6].

With increasing urbanization and industrialization, imbalanced diet and improper eating habits appeared in Turkey as in the Western countries and in the United States. Due to the shortened eating times, individuals tend toward eating fast foods that are satisfying but high in calories.

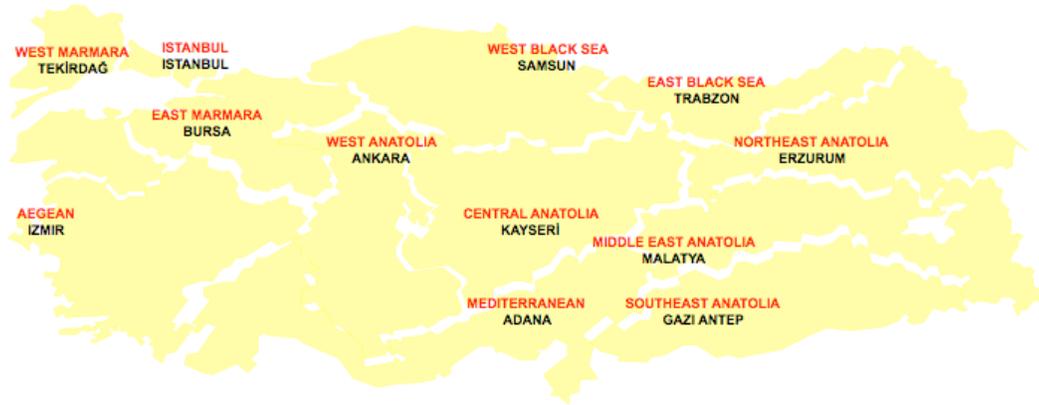
In Turkey, an agricultural country, cereal consumption was 150-200 kg/year per person that later declined after 2000 due to urbanization and industrialization; however, the consumption of fatty and sweet foods has increased. In parallel, the prevalence of obesity has resulted in a marked increase [7,8]. Sedentary lifestyle (lack of regular physical activity) and tendency toward ready-to-eat foods have led to increases in obesity, this is a risk factor for type 2 diabetes mellitus and cardiovascular diseases [9,10]. In Turkish population, nutrition and food distribution show differences according to regions, as well as according to rural and urban areas [11-13]. Excessive physical activity, limited natural food sources, and lack of food diversity, which would ensure a balanced and healthy diet, in rural areas are responsible from this difference.

The present study aimed to evaluate eating habits and physical activity status of Turkish population, and to determine nutritional changes.

## METHODS

The present study was conducted *via* a quantitative method using a face-to-face interview technique with a pre-prepared questionnaire. Subjects aged above 15 years with different levels of socioeconomic status (social grades A, B, C1, C2) who eat out at least once in a month were included in the study. The study was

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**Figure 1:** Provinces included in the study according to NUTS level 1 regions.

carried out in 12 provinces from 11 regions of NUTS (Nomenclature of Territorial Units for Statistics) level 1. These provinces include Adana, Ankara, Samsun, Tekirdag, Trabzon, Bursa, Izmir, Gaziantep, Istanbul, Erzurum, Kayseri, and Malatya (Figure 1). Provinces with a central population above 100,000 were selected. All subjects were informed about the study and provided verbal informed consent.

Height (cm) and weight (kg) of the subjects were measured, their body mass indexes (BMI) were calculated in kg/m<sup>2</sup> based on WHO criteria [14].

Body Mass Index	Classification
Under 18.5 kg/m <sup>2</sup>	Weak
18.5-24.9 kg/m <sup>2</sup>	Normal weight
25-29.9 kg/m <sup>2</sup>	Lightly fat
30-34.9 kg/m <sup>2</sup>	Lightly obese (I.Level)
35-39.9 kg/m <sup>2</sup>	Heavily obese (II.Level)
Above 40 kg/m <sup>2</sup>	Very heavily obese (III.Level)

**Statistical Analysis**

The present study included 1536 subjects with 95% confidence interval and a margin of error of ±2.5. A t-test was used along with frequency calculation. Data were analyzed by Statistical Package for the Social Sciences (SPSS) for Windows (version 13.0; SPSS Inc., Chicago, IL, USA).

**RESULTS**

**Demographic Characteristics of the Study Population**

The mean age of 1536 subjects (50.3% females and 49.7% males) included in the present study was 36.5±6.5) years.

Gender	%
Female	50.3%
Male	49.7%

Of the subjects, 54.7% were married and 37.6% were single.

Marital Status	%
Single	37.6%
Married	54.7%
Other	7.7%

The average number of household members was 3.5±1.02. The majority of the subjects had a moderate socioeconomic level (social grades C1 and C2. The mean income level was 880,0 €.

Of the subjects, 30.5% were primary school graduates, 43.6% were high-school graduates, and 25.1% were university graduates or postgraduates.

Education	%
Primary	30.5%
High School	43.6%
Bachelor's Degree	25.1%
Master's and above	0.8%

According to employment status of the subjects, 19.4% were self-employed, 34.7% were wageworker, and 45.9% were unemployed.

Employment Status	%
Self-employed	19.4%
Wageworker	34.7%
Unemployed	45.9%

Of the study subjects, 73.9% reported a disease diagnosed by a doctor, whereas 26.1% did not. The most common disease was cardiovascular diseases with a rate of 10.5%, followed by diabetes with a rate of 3.6%.

In the whole study group, the mean height was 169 cm (163.4±6.3 cm for females and 174.8±6.9 cm for males) and the mean weight was 69.9 kg (63.3±11.1 kg for females and 76.5±11.7 kg for males). The mean BMI of the whole study group was 24.4 kg/m<sup>2</sup>; of the subjects, 33.6% were overweight and 18.4% were obese; i.e. 52% in total were over normal weight.

Gender	Height	Weight
Female	163.4 cm (±6.3)	63.3 kg (±11.1)
Male	174.8 cm (±6.9)	76.5 kg (±11.7)
Average	169 cm	69.9 kg

### Eating Awareness

To evaluate eating awareness, the subjects were questioned about the factors that they pay attention while consuming food and beverages. It was observed that the rate of subjects calculating and not calculating the calorie intake on their food choices was 8.4% and 92.6%, respectively. The rate of women Calculating

The Calorie Intake was higher than that of males.

Gender	Calculating The Calorie Intake (%)
Female	43.9 %
Male	35.8 %

It was noted that the rate of those calculating the calorie intake increased with increasing age, socio-economic status and education level (Figure 2).

Correlations		Calculating The Calorie Intake
BMI	Pearson Correlation	0.04
	Sig. (2-tailed)	0.11
	n	1536

Correlations		Calculating The Calorie Intake
Age	Pearson Correlation	0.08
	Sig. (2-tailed)	0.00
	n	1536

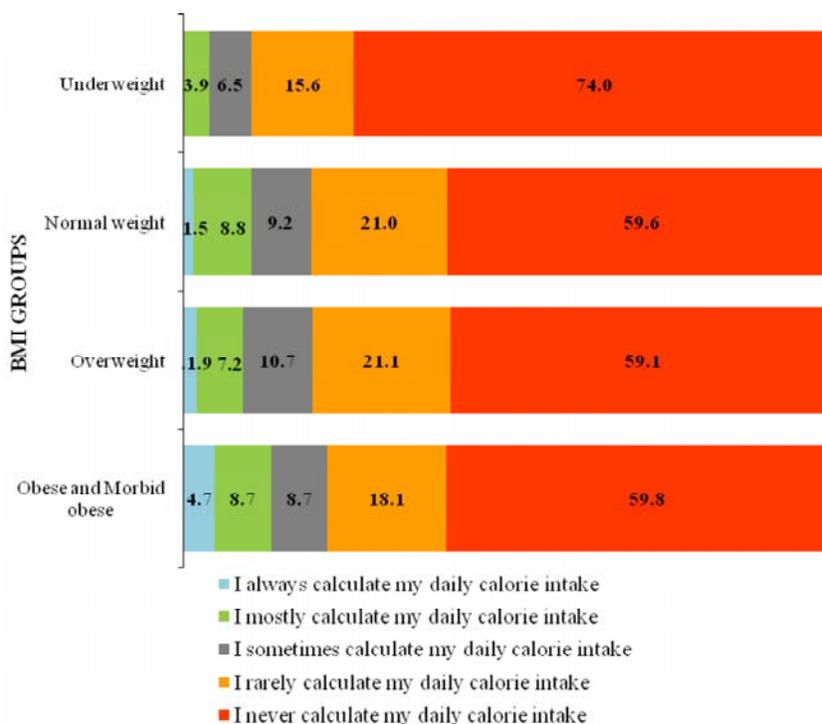


Figure 2: Distribution of subjects in the BMI groups according to their calculation statuses of daily calorie intake.

Correlations		
		Calculating The Calorie Intake
SES	Pearson Correlation	-0.15
	Sig. (2-tailed)	0
	n	1536

Correlations		
		Calculating The Calorie Intake
Education	Pearson Correlation	0.13
	Sig. (2-tailed)	0.00
	n	1536

**Reading Nutrition Facts Label While Consuming Food and Beverages**

Approximately 82.5% of the Turkish population do not read nutrition facts label. In this study group, the rate of the subjects reading nutrition facts label was 29.1%. whereas the rate of those not reading nutrition facts label was 52.7%, (45.2% in females and 60.2% in males).

Gender	Not Reading Nutrition Facts Label (%)
Female	45.2%
Male	60.2%
Average	52.7%

The rate of subjects reading nutrition facts label was observed to be increased with increasing age, socio-economic status and education level.

Correlations		
		Reading Nutrition Facts Label
Age	Pearson Correlation	0.07
	Sig. (2-tailed)	0.00
	n	1536

Correlations		
		Reading Nutrition Facts Label
SES	Pearson Correlation	-0.16
	Sig. (2-tailed)	0.00
	n	1536

Correlations		
		Reading Nutrition Facts Label
Education	Pearson Correlation	0.13
	Sig. (2-tailed)	0.00
	n	1536

**Eating Habits**

Of the subjects included in the study, 34% ate out at least 6-7 meals in a week. Monthly average is 14.0±10.1. It was observed that lunch was the most common meal eaten out. Dinner and breakfast were eaten mostly at home. It was noted that males more frequently ate out than females and that 15-45 year-old subjects most often ate their lunch out, whereas subjects above 45 years of age preferred eating at home.

Gender	Eating Out (Mean-Monthly)
Female	11.3
Male	16.7
Average	14.0

Eating out was observed to be more frequent in subjects with higher education level and in those performing sport activities. Additionally, the rate of eating out is frequent in the group of employed persons than in the unemployed subjects [15].

Correlations		
		Eating out
Education	Pearson Correlation	0.16
	Sig. (2-tailed)	0.00
	n	1536

Correlations		
		Eating out
Performing Sport Activities	Pearson Correlation	-0.14
	Sig. (2-tailed)	0.00
	n	1536

Correlations		
		Eating out
Employment	Pearson Correlation	-0.51
	Sig. (2-tailed)	0.00
	n	1536

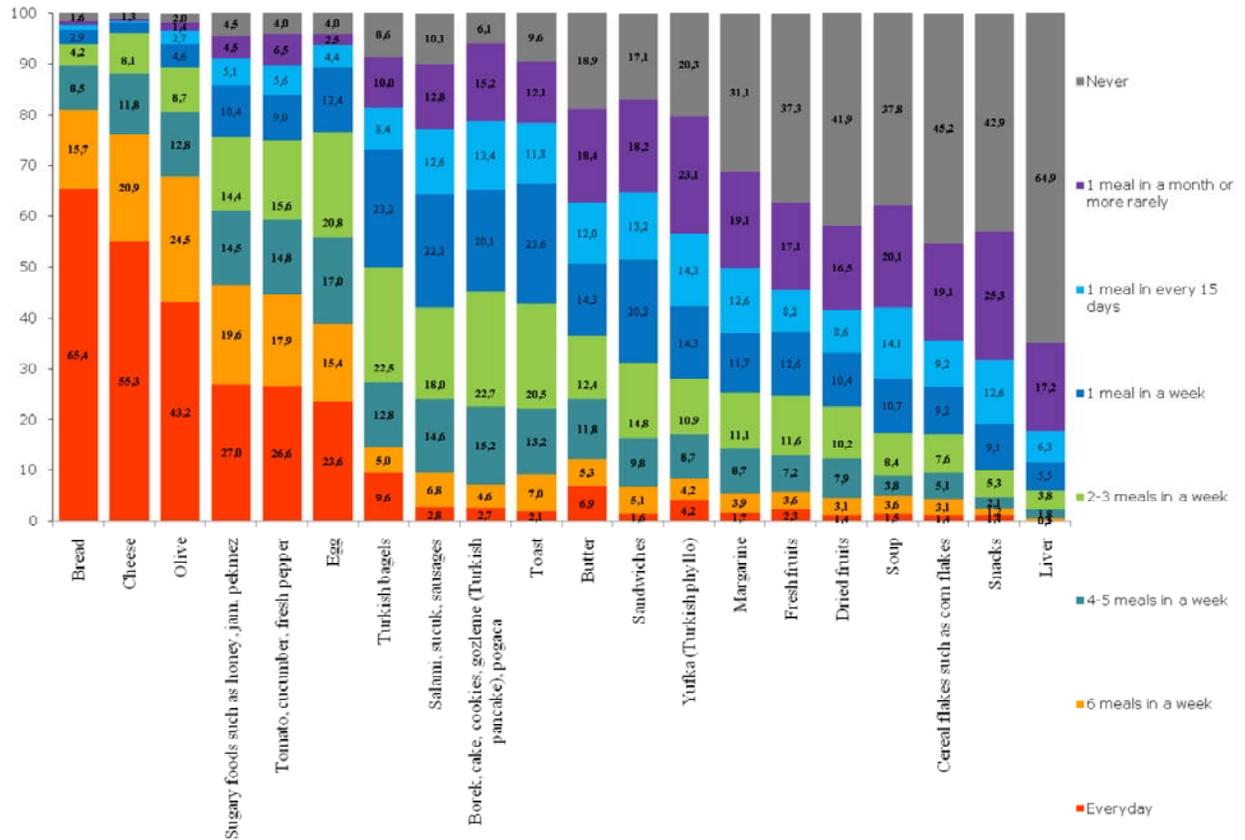


Figure 3: Distribution of the subjects according to the consumption frequency of foods consumed at breakfast.

**Daily Eating Habits**

The rate of subjects having breakfast everyday was 68%. Of the subjects, 31.6% did not have breakfast regularly and 0.4% of the subjects did not have breakfast at all. The rates of subjects having lunch regularly and irregularly were 63% and 37%, respectively. Additionally, the rates of subjects having dinner regularly and irregularly were 72% and 27.3% respectively.

**Foods Consumed at Breakfast**

We continue consuming traditional foods at breakfast (Figure 3). Bread, cheese and olive were consumed everyday at a rate of 67.7%-81.1%, followed by honey, jam, pekmez (fruit molasses), tomato, cucumber, and egg at a rate of 39%-46.6%. When the consumption frequency of these foods in a month was questioned, it was observed that the consumption frequency of bread, cheese and olive was 23-26 days in a month.

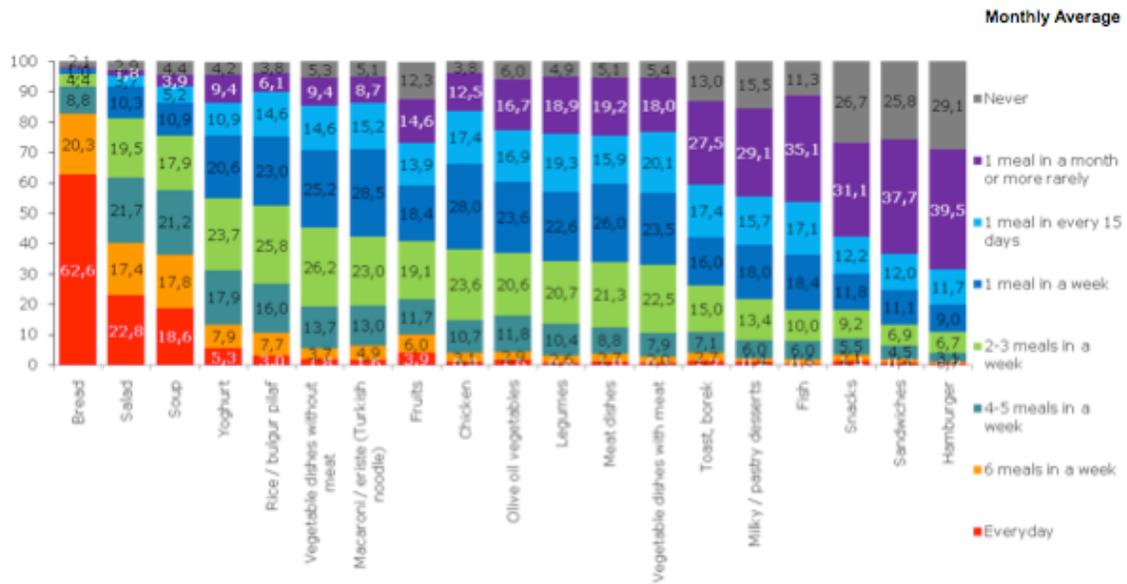
Simit (Turkish bagels), borek and pogaca (types of Turkish pastries), cake, sucuk (Turkish dry-fermented sausage), salami, and butter appeared as the most

frequently consumed food apart from traditional foods depending on the regions. It was observed that women had a more traditional breakfast than men did and that men more often consumed Turkish bagels, Turkish pastry, and soup, which are easy to eat out. Young subjects more often consumed snack foods (toast, Turkish bagels, salami, sausages, chocolate, biscuits and crisps). The consumption of snacks (toast, salami, sucuk, and sausages) was observed to be increased with increasing education level.

Correlations			
		Toast	Salami, Sucuk, And Sausages
Education	Pearson Correlation	0.03	0.06
	Sig. (2-tailed)	0.28	0.01
	n	1536	1536

**Foods Consumed at Lunch**

We continue consuming traditional foods at lunch. Bread, soup, salad, yoghurt, and pilaf were the most commonly consumed foods, whereas olive oil vegetables, vegetable dishes without meat, chicken,



**Figure 4:** Distribution of the subjects according to the consumption frequency of foods consumed at lunch.

and fish were less frequently consumed (Figure 4). The consumption rate of bread was 82.8% and the consumption frequency of bread was 26±10.3 days in a month. Salad has a consumption rate of 42% and a consumption frequency of 17.7±8.2 days, soup has a consumption rate of 36.4% a consumption frequency of 16±10.1 days in a month. The consumption frequency of meat was 1 or 2 days in a week. The consumption frequency of fish was once in every 15±1.0 days. Based on the NUTS level 1 regions, in addition to traditional foods, the most frequently consumed foods at lunch were olive oil vegetables, vegetable dishes without meat, and chicken in the western part of Turkey and in the Marmara region, whereas the most commonly consumed foods at lunch were meat dishes, vegetable dishes with meat, and legume dishes in the Middle Anatolian, and in the East and South Anatolian regions.

**Foods Consumed at Dinner**

Study subjects were consumed traditional foods at dinner, as was at lunch. However, the amount of food consumed at dinner was observed to be higher than that consumed at lunch. The mean number of meals per month was 1%-2% higher. Based on the NUTS level 1 regions, in addition to traditional foods, the consumption of meat, chicken and vegetable dishes with meat was higher at dinner than at lunch.

The frequency of consuming meat dishes and vegetable dishes with meat was higher in the eastern regions. The frequency of consuming snack foods

(toast, hamburger, and pastry) was higher among students. A decrease in the consumption of snacks and sweet foods was observed with increasing BMI.

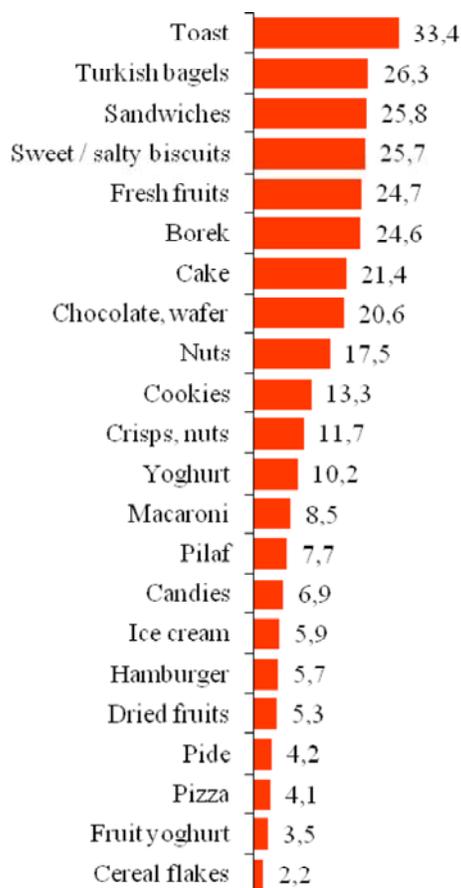
Correlations			
		Toast	Salami, Sucuk, And Sausages
BMI	Pearson Correlation	-0.09	-0.03
	Sig. (2-tailed)	0.00	0.27
	n	1536	1536

**Foods Consumed at Snacks**

As presented in Figure 5, the most frequently consumed foods at snacks were toast, sandwiches, Turkish bagels, biscuits, borek, cake, chocolate, and wafer at a rate ranged from 20% to 33%. Crisps, candies, hamburger, pide (Turkish pizza with meat) and pizza, so-called fast food, are consumed at a rate of 4% to 11%.

**Duration of Meals**

The mean duration of meals was less than 30±5.7 min in 85.8% of the study population. The duration of meals was observed to be increased with increasing weight. The frequency of eating five meals regularly was very low with a rate of 4.4%. The present study population did not have balanced and healthy eating habits.



**Figure 5:** Consumption frequency of foods consumed at snacks (values under 2.2% are not included in the graphic, the total number exceeds 100% due to participants giving more than one answer).

### Beverage Consumption Habits

Evaluation of the consumption frequency of non-alcoholic beverages (except water) revealed that tea was the most commonly consumed beverage at a rate of a few times a day. Of the study participants, 95.7% reported to consume tea both in summer and in winter, and tea was followed by coffee 58.7%, ayran (Turkish yoghurt drink) 56.1%, carbonated beverage 48.3% and fresh fruit juice 25.2%. The consumption rate of milk was very low 20.2%.

Non-alcoholic Beverages	%
Tea	95.7%
Coffee	58.7%
Turkish Yoghurt Drink	56.1%
Carbonated Beverages	48.3%
Fresh Fruit Juice	25.2%
Milk	20.2%

Coffee and herbal teas were consumed mostly by women and ayran was consumed mostly by men.

Gender	Tea	Herbal Tea
Female	47.2%	5.6%
Male	48.6%	3.9%

The consumption frequency of coffee, mineral water and energy drinks was noted to be increased with increasing education level (Figure 6).

Correlations		Coffee	Mineral Water	Energy Drinks
Education	Pearson Correlation	0.02	0.07	0.08
	Sig. (2-tailed)	0.52	0.01	0.00
	n	1536	1536	1536

### Consumption Frequency of Alcoholic Beverages

The study participants were questioned about if they consumed alcohol at least once within the last 1 year. It was observed that 26.6% of the study participants consumed alcohol and 73.4% did not. The rate of females and males consuming alcohol was found to be 18.1% and 35.3%, respectively. Among alcoholic beverages, beer, raki, vodka and wine were the most frequently consumed beverages (Figure 7).

### Smoking Status

Of the study participants, 42.1% were smokers and 57.9 % were non-smokers. In Turkey, 31.2% of the adults above 15 years of age are smokers [16].

### Performing Sportive Activities

The participants were questioned about if they actively perform sports. The rates of participants doing and not doing active sports were 14.8% and 85.2%, respectively. The rates of women and men doing sports were 6.1% and 23.6%, respectively. The frequency of doing sports was noted to be decreased with increasing age and weight. The reasons for doing or not doing sportive activities were lack of time in 70.8%, lack of vitality to do sports in 20.2% and lack of appropriate place in 4.3% of the participants.

Correlations		Performing Sportive Activities
Age	Pearson Correlation	0.24
	Sig. (2-tailed)	0.00
	n	1536

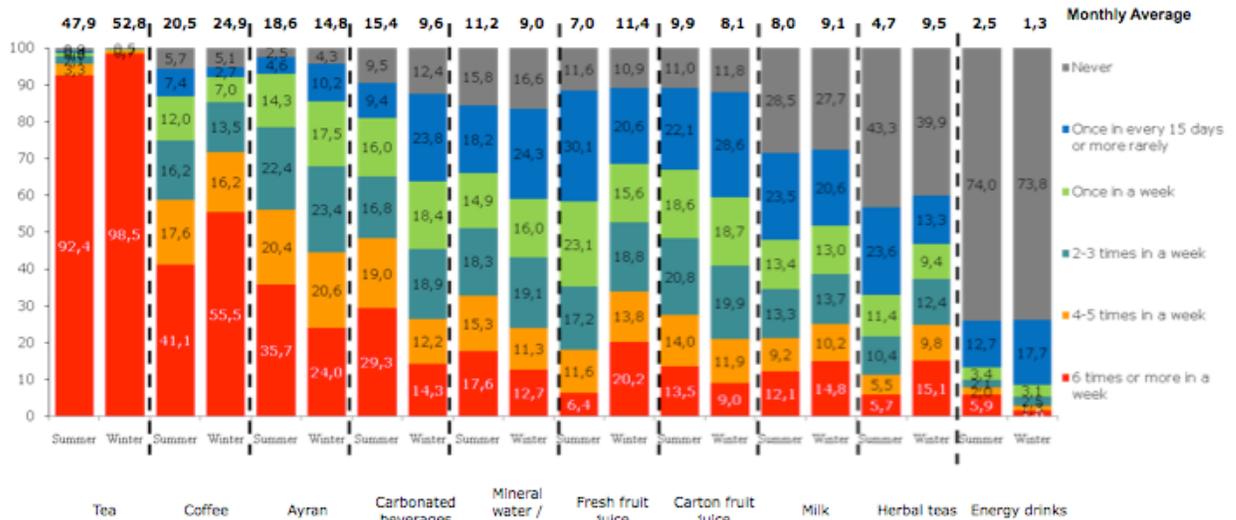


Figure 6: Consumption frequency of beverages (the frequency of consumption was evaluated independently from the amount).

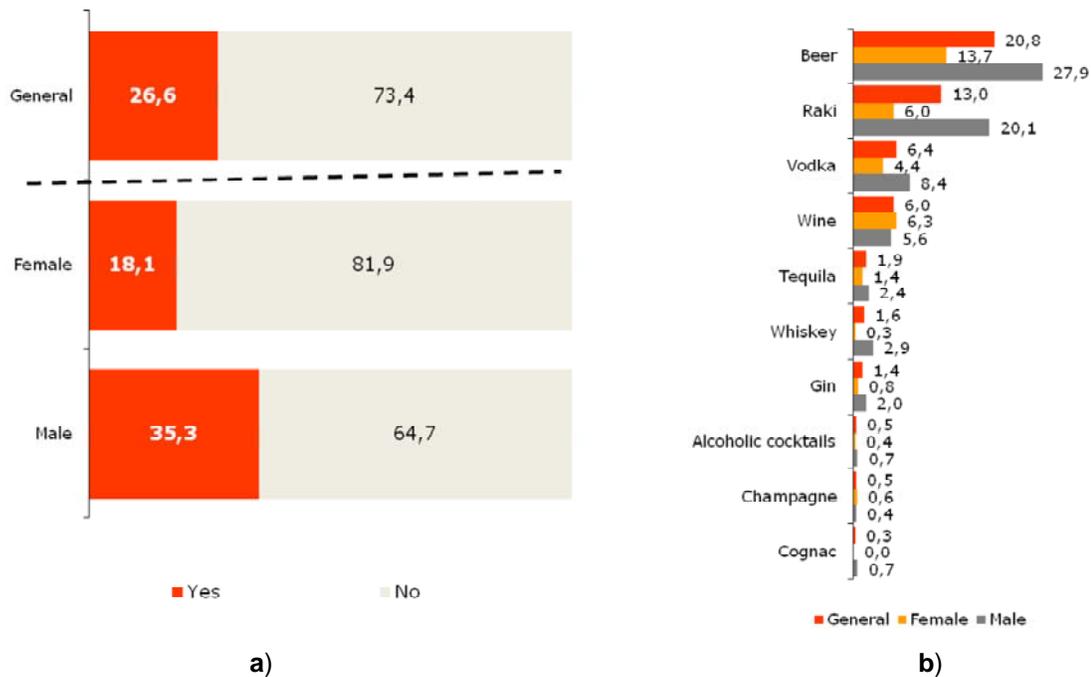


Figure 7: a) Alcohol consumption status within the last 1 year, b) consumption frequency of alcoholic beverages within the last 1 year.

Correlations		Performing Sportive Activities
Weight	Pearson Correlation	-0.06
	Sig. (2-tailed)	0.02
	n	1536

**Physical Activity Status**

The participants were also questioned about physical activities such as going to somewhere on foot

and house cleaning. The rates of participants responding “yes” and “no” were 63.1% and 36.9%, respectively. Women were observed to perform physical activities more often than men did. While 8 out of 10 women performed physical activities, this rate was 5/10 in men. The most frequently performed activities were walking, house cleaning, exercises at home, and running. Physical activity was noted to be decreased with increasing age. It was observed that subjects tended to do physical activity with increasing weight. The mean duration of walking per day was

determined to be 39.7 min. Participants between 15 and 29 years comprised a population having the highest rate of walking and running.

Correlations		Physical Activity
Age	Pearson Correlation	0.01
	Sig. (2-tailed)	0.67
	n	1536

Correlations		Physical Activity
Weight	Pearson Correlation	0.08
	Sig. (2-tailed)	0.00
	n	1536

### Conditions Impeding Physical Activity

In the whole study group, the mean duration of computer use, watching TV, and reading newspapers/books was 135±135.1 min, 142±87.0 min and 32.7±48.42 min, respectively; these findings revealed the reasons for performing physical activities less frequently in our population.

### DISCUSSION

Healthy nutrition and lifestyle are the most important factors in the maintenance of well-being and prevention of chronic diseases [17,18]. In the WHO guideline, it has been reported that besides physiological changes, chronic illnesses also increase as the life span increases and that this is accompanied by nutritional problems; therefore, measures are called for to promote balanced and healthy nutrition and physical activities. The relationship of obesity, frequency of which shows a worldwide increase, with quality of life and nutrition has been greatly emphasized [19,20]. Healthy nutrition, educating children and young individuals to keep them away from bad eating habits and disorders and promoting physical activities have become healthy nutrition strategies of the countries [21-23].

The present study was conducted to determine eating habits and physical activity status of Turkish population, to compare the findings with that of previously published studies and thereby to understand the status of Turkish population in 2012 (unpublished data, 2010).

The mean number of household members was found to be 3.5±3.1 in the city centers. We well know that this number is above 5 outside the city center, in rural areas, and in suburban settlements [24].

In the present study, the rate of unemployed participants being 45.9% was attributed to the high rate of women (50.3%) in the study. The rate of participants with a disease diagnosed by a doctor being high as 26.1% and most commonly reported diseases being heart disease and diabetes were considered a particular concern requiring further investigation for a population with a mean age of 36.5±6.4 years. In the present study population, the total percentage of overweight and obese subjects was found to be 52%. This finding was in accordance with the finding of countrywide obesity screening program performed by our organization. In a screening study conducted by the Obesity Research Association of Turkey between 2000 and 2005 involving 13,878 subjects from 6 provinces, the rates of overweight, obese and normal weight subjects were found to be 39.6%, 29.5%, and 30.9%, respectively [25].

Questioning of eating habits and healthy eating awareness revealed that the rates of participants calculating the calorie intake and those reading nutrition facts label were very low; these findings indicates that individuals are unaware about healthy eating and particularly children and young individuals should be well educated about nutrition. In the present study, 34% of the participants reported to eat out at least 6-7 meals per week. The most commonly eaten meal out was the lunch. It appears that rapid transition to industrialization and urbanization has caused unavoidable changes in eating habits.

In the whole study group, 68% had breakfast regularly, 63% had lunch regularly, and 72% had dinner regularly. The rate of eating out in the whole study group was 14 times in a month.

Daily eating habits revealed that traditional eating habits continued; however, it was observed that snacks were also consumed at breakfast. The consumption of snacks was more frequent among young individuals and young adults. This could be considered as a factor leading to obesity [20,26]. The most striking finding in traditional lunch and dinner was that olive oil dishes and vegetables were more frequently consumed in the western part of Turkey and meat dishes, fatty food and pastry were more frequently consumed in the eastern part of Turkey.

The consumption rate of easy-to-find and relatively cheap foods such as toast, Turkish bagels, sandwiches, and borek ranged from 20% to 33%, and the consumption rate of fast food ranged from 4% to 10%. It can be concluded that fast foods can be blamed for unbalanced nutrition only in children and young individuals [18,26]. Another finding of the present study was that 85.8% of the study population ate their meals in less than 30 min in average, which indicated a fast eating habit of the participants.

Tea, coffee, Turkish yoghurt drink, carbonated beverages, and fresh fruit juice were the most frequently consumed beverages. The study showed that milk is consumed in very little amounts in our country. This is an important finding in terms of child nutrition. The rate of alcohol consumption was 26.6% and the rate of smoking was 42.1%.

The evaluation of physical activity status, the most important goal of the present study, revealed that subjects rarely did sports but frequently performed physical activities. This high rate of physical activity is caused by women, as they consider housework as a physical activity. On the other hand, it was observed that the study population spared 4-5 hours per day to computers, electronic toys and watching TV, which should be considered as the main problem.

## CONCLUSION

Turkey is comprised of a population having different economic statuses, life and work habits, as well as traditional eating habits based on different geographic regions. In this respect, the results of the present study, which aimed to evaluate eating habits and physical activity status in Turkey, revealed that eating habits continued to be traditional, eating awareness and the rate of sport activities were very low in Turkish population.

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