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### **Dietary habits of Turkish adolescents in Konya, Turkey**

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#### **Abstract**

**Problem Statement:** The adolescence is a crucial stage between childhood and adulthood during which an individual acquires new qualities and practices including dietary habits that may be influenced by his peers and social circle. **Purpose of the study:** To determine the dietary habits of adolescents studying in high schools in Konya, Turkey where obesity has been determined to be considerably high. **Methods:** The population comprised of first year students registered for 2012-2013 academic year at five different high schools selected randomly in Konya. The study included a total of 643 individuals. Data regarding dietary habits of students were collected by means of Adolescent Food Habit Checklist (AFHC) whose validity and reliability studies for Turkish version had been previously published. Means, standard deviation and ANOVA tests were performed for data analysis. **Findings and Results:** The mean age was  $15.18 \pm 0.57$  years of which 65.2% were males. Body mass index evaluation indicated 51.8% of students were underweight, 39.5% normal and 8.7% overweight. Mean AFHC score of students were calculated as  $9.17 \pm 3.70$ . Mean AFHC score obtained by females ( $9.97 \pm 3.67$ ) were significantly higher than males ( $8.74 \pm 3.64$ ) ( $p < 0.01$ ). AFHC scores obtained by overweight students were significantly higher than underweight and normal students ( $p < 0.01$ ). **Conclusions and Recommendations:** Dietary habits in Turkish adolescents were below optimal level. Higher AFHC scores obtained by overweight students as compared to normal suggested adequate nutritional knowledge is not a decisive factor in

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determining dietary habits. Proper dietary habits gained at an early age, is important in bringing up healthy generations.

Keywords: Adolescent, dietary habits, body mass index

## 1. Introduction

There is an epidemic of overweight and obesity among adolescents in the world today with children developing obesity related conditions, previously mostly confined to adults [1]. The etiology and consequences of adolescent obesity are diverse but it has usually been linked to unhealthy eating habits and a lack of physical exercise [2]. Globally, nutrition related chronic diseases such as diabetes mellitus (Type II), hypertension, cardiovascular disease, micronutrient deficiency, poor eating patterns and lifestyles are some of the main nutrition related issues among adolescents [3].

According to a recent government report, the national obesity rate in Turkey, over the age of 15, has risen to 17.2%. A startling 3.6% increase in overweight has been recorded in the last three years from 31.2% to 34.8% [4]. Rapid changes in physical growth and psychosocial development have placed young adults as nutritionally vulnerable groups with poor eating habits, which fail to meet dietary requirements [5]. Some common unhealthy eating patterns among young adults include meal skipping, eating away from home, snacking and fast-food consumption [6]. Environmental factors as peer pressure, mushrooming of shopping malls, fast food outlets, lack of knowledge of healthy food choices contribute to adoption of unhealthy eating habits among adolescents and children, affecting their eating habits and nutritional status negatively [7].

A survey determining the eating patterns of Turkish school children aged 11-15 years reported that less than 2% met all the recommendation of the Food Guide Pyramid [8]. Another study on Turkish adolescents aged 10-18 years demonstrated that 53% consumed fast food at least 1-2 times in a week with daily consumption of fruits or vegetables being less than two servings [9].

Konya, located in central Anatolian region in Turkey is reported to have a relatively high prevalence of obesity and diabetes mellitus [9, 10]. The current cross sectional study was aimed at assessing the dietary habits and its associated factors in high school students in Konya.

## 2. Methods

The experimental population comprised of students studying in high schools belonging to Selcuklu county of Konya province. The experimental sample included students attending five different high schools chosen randomly from this area. Students from each high school represented a cluster. The size of the sample was determined by G\*Power 3.1.5 analysis. Every cluster consisted of 120 students resulting in 600 students in total.

Data was collected by means of a questionnaire form prepared by the researchers based on literature review and the Adolescent Food Habits Checklist (AFHC) developed by Johnson et al, with the object of measuring healthy eating behavior of adolescents between 13-16 years of age [11].

The questionnaire comprised of twenty three questions in all, including twelve questions about the demographic characteristics of the adolescents and their family. Six questions were about their life styles as sleeping and working hours, time spent watching television, use of computer and sports activities. The rest of the five questions enquired about their nutritional status and the type of food consumed on a weekly basis. A true / false response format was selected to make the checklist easier to complete. Participants received one point for each 'healthy' response [11]. Reliability and validity of this measure in Turkish version was performed by Arikian et al, in 2012 [12]. Four items with the inter-item correlation between 0.2 were eliminated from the Turkish version of AFHC measure.

The final instrument consisted of 19 items evaluating consumption of sugar (4 items), fat (6 items), vegetable and fruit consumption (6 items), carbohydrate, fast-food consumption (2 items) and general diet (1 item). The inter-item correlation between these items, were between 0.21-0.46. The maximum score to be attained by the Turkish version of AFHC instrument was determined to be 19. Procurement of a high score by the students demonstrated healthy eating habits on the part of the adolescent [12].

### 3. Findings and Results

The mean age of the adolescents participating in the study was 15.18±0.57 years, 62.2% were males; 88.6% of the students were from nuclear families, 29.4% stated their economic status to be in good condition.

Factors that might be considered to affect eating habits of students, as hours spent sleeping, studying lessons, watching television, using computer were enquired. Results indicated 70.0% slept for 6-9 hours, 53.3% spent 1-3 hours on school assignments, 43.4% spent 1-3 hours watching television and 31.9 % spent 1-3 hours for computer use on a daily basis. Majority (63.9%) of the students reported that they did not involve in any kind of sports activity, 14.8% reported that they played football, 12.3% played basketball and 9.0% of the students played volleyball.

Frequency of meals consumed by majority (63.5%) of the students were, according to the daily recommendations however, 44.8% skipped at least one meal. Of the students, 28.3% stated that they skipped breakfast, 15.1% skipped lunch and 1.4% of the students skipped their evening meals.

On enquiring the frequency of fast food consumption, it was determined that only 10.1% stated that they did not consume any fast food, 16.0% consumed fast food once a week, 2.4% twice a week, 15.2% consumed thrice a week, 9.3% four times a week, 15.7% five times a week and 13.2% of the students consumed fast food six times or more in a week.

On evaluation of body mass index (BMI) of the students, 51.8% were found to be underweight (BMI <18.5), 39.5% were normal and 8.7% were overweight (BMI >25.0). Variation of BMI based on gender difference were found to be statistically insignificant (t=-1.173; p=0.241).

The total mean score obtained by the participants on Adolescent Food Habit Checklist (AFHC) was determined to be 9.17±3.7 (min=0; max=18). The range of AFHC scores obtained by the students according to their demographic characteristics, are given in Table 1 below.

According to the results; AFHC scores obtained by female students were found to be significantly higher as compared to males (p<0.001). Mean AFHC scores between age groups were also significantly different from each other (Table 1). Tukey HSD advanced analysis test demonstrated a notable difference between the AFHC scores of 14 year aged and 16 year aged students (p=0.032) which was also found to be statistically significant. The AFHC scores obtained by 14 year aged students were determined to be considerably high.

Besides, AFHC scores also showed significant difference based on BMI of the students and frequency of consumption of meals in a day (p<0.01). Overweight students obtained significantly higher scores compared to underweight (p=0.000) as well as normal weight students (p=0.008). Students consuming four or more meals in a day demonstrated significantly lower AFHC scores as compared to students who consumed meals twice (p=0.011) and thrice (p=0.000) a day.

Table 1. Mean AFHC scores obtained by students according to demographic characteristics

Characteristics of Students	AFHC Mean Score	Level of Significance
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Gender			
Female	9.97±3.67		0.000
Male	8.74±3.64		
Age			
14 years	10.20±3.74		
15 years	9.20±3.66		0.041
16 years	8.74±3.72		
Body Mass Index			
Underweight	8.81±3.68		
Normal	9.27±3.55		0.000
Overweight	10.89±3.95		
Number of meals/day			
2 meals	9.14±3.70		
3 meals	9.57±3.64		0.000
Four meals and above	7.76±3.58		
Frequency of fast food consumption (Weekly)			
Never	9.23±3.78		
Once	9.69±3.61		
Twice	10.06±4.02		0.000
Thrice	9.26±3.61		
Four times	9.15±3.92		
Five times	8.54±3.15		
Six or more	7.81±3.33		

Consumption of fast food frequency affected AFHC scores significantly (Table 1). AFHC score of students consuming fast food once a week was significantly higher than the ones who consumed six or more times ( $p=0.008$ ). Similarly AFHC score of students consuming fast food twice a week was significantly higher than the ones who consumed five times ( $p=0.029$ ) and six or more times ( $p=0,000$ ).

Factors such as age, education, profession of mother or father, family size, sports activity level of the student and skipping of meals did not affect AFHC scores in a significant way ( $p>0.05$ ).

On investigating the types of beverages consumed by the students between meals, water (78.5%), coke (61.0%) and tea (60.3%) were among the first three on the preference list. Fruit juice (50.5%), butter milk (49.5%), coffee (29.2%), milk (22.2%) and soda (21.8%) followed. Relation between the choice of beverage and AFHC scores indicated student preferring coke had a significantly lower AFHC score compared to the group that did not (Table 2).

Regarding snack items consumed, chocolate (71.5%), cookies (54.7%) and cakes (49.0%) were among the first three on the preference list followed by ice cream (47.4%), chips (39.5%) and crackers (38,6%). Relation between the choice of snack items and AFHC scores indicated that student not consuming chocolate and chips had a significantly higher AFHC score compared to the group that consumed them between meals (Table 2).

Table 2. Snack items consumed by students between meals

Food Items	Percent (%)	Mean	Level of Significance
Coke			

Yes	61.0	8.51±3.60	0.000
No	39.0	10.21±3.60	
Chips			
Yes	39.5	8.42±3.52	0.000
No	60.5	9.67 ± 3.73	
Chocolate			
Yes	71.5	8.94±3.57	0.010
No		9.77±3.95	

#### 4. Discussion

Although the results of this study did not indicate an overweight problem among the participants (9% approximately); nevertheless, the students did not have a healthy eating pattern in general. Moreover, the physical activity level was found to be considerably low. 64% stated that they did not engage in any sports activity, which were similar to studies performed earlier on Turkish adolescents [6, 2]. Regarding eating habits, earlier studies also reported skipping meals among adolescents [13, 8]. This study indicated that 45% of the participants skipped at least one meal in a day and 28% skipped breakfast. Yıldız et al in their study found that rate of skipping breakfast varied between 12-26% depending upon the school level. As the school level increased from primary to secondary the rate of skipping breakfast increased. Breakfast is considered to be the most important meal and evidence suggests that breakfast consumption may improve cognitive function related to memory, test grades, and school attendance [14]. Consumption of fast food was found to be prevalent; more than half (53.4%) consumed fast food three times or more in a week. These results were in concordance with those obtained by Aksoydan et al, and Akman et al, in their studies with Turkish adolescents [6, 8].

In this study, AFHC mean scores obtained by the female students were determined to be significantly higher than males; also, participants from younger age group demonstrated significantly higher mean AFHC scores. Previous studies indicated that girls pay more attention to body image, dietetics and snack less than boys. Young adolescents prefer bland and familiar foods whereas older ones learn to appreciate 'adult' foods. As they grow older, children snack more, skip more meals [15]. Education of parents and social economic status of family has been shown to positively affect the healthy eating culture in the family. Children from low and medium parental education level groups exhibited lower consumption of low-sugar, low fat foods like vegetables, fruits, wholemeal bread and higher consumption of high-sugar and high-fat foods as fried potatoes, snacks, desserts and sugared beverages [16]. On the other hand high socio-economic status was positively associated with intake of high-energy and fast foods [17]. However in our study, AFHC score was not affected by economic status and structure of family, age or education of parents ( $p>0.05$ ).

Tea is widely grown in the North, black sea area of Turkey and is the most common, economic and preferred hot beverage in Turkey among all groups. Coke was the next most popular drink, nearly two third of all students preferred coke to any other drink. In a study performed in US on 16,188 students in grades 9 through 12, sugar sweetened sodas were found to be consumed at least once a day by 30% of the students [18]. Among the types of fast food consumed, potato chips and chocolates were most popular, similar to the findings of Yıldız et al and Akman et al. Yıldız et al found that 33.3% Of students consumed chocolate daily and potato chips 1-2 times a week. In Akman et al's study, 31.5% of students consumed fast food at least once every day. AFHC scores obtained by overweight students were significantly higher than underweight and normal students ( $p<0.01$ ) suggesting that adequate nutritional knowledge is not a decisive factor in determining dietary habits.

#### 5. Conclusion and Recommendation

In this study, Dietary habits in Turkish adolescents were found to be below optimal level. Although obesity did not stand out as a major problem, more than half of the students were found to be

underweight. Consumption of fast food and sugar sweetened beverages were prevalent. Majority of the students had a sedentary life style with no involvement in any kind of physical activity. AFHC scores of students did not affect their food habits indicating that dietary habits of an individual are imprinted at an early age and difficult to change later. Nutrition education and awareness and proper dietary habits gained at an early age, is extremely important in bringing up healthy generations.

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