

Akdeniz Diyetine Uyum ve Üniversite Öğrencilerinin Bazı Antropometrik Özellikleri

Adherence to the Mediterranean Diet and Some Anthropometric Measurements of University Students

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ÖZ

Amaç: Üniversite öğrencilerinde Akdeniz Diyetine Uyum (ADU) ve AD bileşenleri ile bazı antropometrik özellikleri değerlendirmektir.

Materyal ve Metot: 510 üniversite öğrencisi ile aralık ayında yürütülen kesitsel tipte bir çalışmadır. ADU, KIDMED (Akdeniz Diyeti Kalite İndeksi) ile değerlendirilmiştir.

Bulgular: Öğrencilerin yaş medyanı 21 (2) yıldır ve çoğunluğu (%60,2) kız öğrenciler oluşturmaktadır. 'KIDMED' puan ortalaması tüm grupta $4,0 \pm 2,6$ 'dır. ADU, öğrencilerin %37,3'ünde zayıf, %53,3'ünde orta, %9,4'ünde yüksektir. KIDMED grubu ile yaşanan yer, cinsiyet, yaş grubu ve bel çevresi arasında anlamlı bir farklılık bulunmamaktadır. BKİ ile KIDMED grubu arasında ise önemli bir farklılık saptanmıştır. Obez ve kilolu bireylerde günde 2 kez den fazla meyve tüketiminin normal vücut ağırlığındaki öğrencilerden daha fazla olduğu görülmüştür. Ayrıca obez ve kilo fazlalığı öğrencilerin kahvaltıda tahıl ürünlerini normal vücut ağırlığına sahip bireylerden daha az tükettiği saptanmıştır.

Sonuç: Bu çalışmada, ADU ile BKİ grubu arasında ilişki olduğu belirlenmiştir. Ayrıca KIDMED bileşenlerinin BKİ ve cinsiyete göre farklılık gösterdiği saptanmıştır.

Anahtar Kelimeler: BKİ, KIDMED, Üniversite öğrencileri

ABSTRACT

Objective: The purpose of this research was to determine adherence in Mediterranean diet (AMD) and its components and some anthropometric measurements of university students.

Materials and Methods: This cross-sectional study was carried out on 510 university students in December, 2019. AMD was evaluated by the Mediterranean Diet Quality Index (KIDMED) questionnaire.

Results: The median age of the students was 21 (2) years and the majority of them (60.2 %) were women. The mean score on the 'KIDMED' was 4.0 ± 2.6 among the whole group. The AMD was poor in 37.3%, medium in 53.3% and high in 9.4% of the students. There was no statistically significant differences according to KIDMED groups between gender, age groups, place of residence, waist circumference (WC), waist/hip ratio (WHR). Between BMI and KIDMED groups a significant difference was found. Overweight and Obese (OWB) students consumed fruit twice a day more frequently than normal weight (NW) students. OWB consumed less cereals or grains (bread, etc.) for breakfast than NW.

Conclusion: According to the results of this study, AMD were found to be related with BMI value. In addition, KIDMED items differ according to gender and BMI values.

Keywords: BMI, KIDMED, university students

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INTRODUCTION

Being physically and mentally healthy, maintaining health in every period of life is possible with adequate and balanced nutrition.¹ Healthy nutrition is take necessary nutrients the most economical way without losing nutritional value and disrupting health to growth and development, live healthy and productive for a long time. Nutrition is a sociological and psychological event as well as physiological. The conditions in some periods of life affect the eating habits.

University is very important period in terms of determining nutrition and lifestyle habits. The unhealthy lifestyle and eating habits in this period continue at a later age.^{2,3} Nutritional habits of university students generally change. Usually living separately from the family, new friend environment, intense university education and starting to make their own free choices often affect their eating habits negatively.³⁻⁵ Unhealthy lifestyle factors especially eating habits are one of the causes of overweight. It is known that nutrition plays a key role in the prevention of many chronic diseases such as cardiovascular diseases, many types of cancer, obesity, hypertension, diabetes, allergic diseases, osteoporosis and dental caries. Determining the nutritional habits of the students is important in terms of preventing possible disorders that may be caused by inadequate and unbalanced nutrition and regulating the nutritional habits in the adult period.^{6,7}

There are many healthy nutrition models. However, the Mediterranean diet (MD) is accepted one of the healthiest diet models in the world. The Mediterranean Diet Quality Index (KIDMED) was developed in 2004 to evaluate compliance with MD in children, adolescents and young people. KIDMED is widely used to assess the nutritional status of children, adolescents and young people in the Mediterranean basin including Spain,⁸ Italy, Greece,⁹ Turkey¹⁰ and Cyprus.¹¹

The objective of this research is to examine adherence in Mediterranean diet (AMD) and the relationship between AMD and anthropometric measurements and some other sociodemographic factors in university students.

MATERIALS AND METHODS

The study approved by Osmaniye Korkut Ata University Ethics Committee (Date: 29/11/2019, decision no: 30867). This study performed with the 1964 Helsinki declaration and its later amendments or

com-parable ethical standards.

This descriptive cross-sectional study was conducted with young adults aged 18-24, 510 students, 307 females and 203 males studying at Osmaniye Korkut Ata University in Osmaniye, Turkey. The data were collected in December 2019.

The sample size was calculated by using the sample size calculation formula in groups with unknown population $n=t^2(pq)/d^2$ ($t=1.96$, $d=0.05$, $p=0.5$). The number of students to be reached was determined by increasing the determined sample size by 30% ($384+115=499$). Students between the ages of 18-24 who have no chronic illness and agree to participate in the study were included in the study.

A survey form which consisted of 25 questions was used. The first part of the questionnaire contains some sociodemographic questions (age, gender, place of residence). In the second part of the questionnaire, anthropometric measurements [height, body weight, upper middle arm circumference (MUAC), waist circumference (WC), hip circumference (HC)] are questioned. The body weight, height, WC, HC and MUAC measurements were taken. Height was measured using a stadiometer. Weight was measured without shoes. WC and HC were measured by the researchers using a non-stretched tape measure. WC was measured at the level of superior iliac crystals. HC was measured around the widest part of the hip.

Body mass index (BMI), waist/hip ratio (WHR) and waist/height ratio (WHtR) were calculated. BMI was calculated as weight (kg) / height (m²). The participants were classified in four groups according to their BMIs: underweight (BMI < 18.5 kg/ m²), normal weight (18.5-24.9 kg/m²), overweight (25.0-29.9 kg/ m²) and obese (≥ 30.0 kg/m²).¹² According to the data of WHO, abdominal obesity criterion was recommended as ≥ 102 cm in men and ≥ 88 cm in women. WC ≥ 94 and ≥ 80 cm for male and female, respectively was defined as overweight.¹³ WHtR was calculated by dividing waist circumference by height length. WHtR >0.5 for male and female are defined as markers of increased risk of chronic disease. WHtR ≥ 0.5 was defined as a measure of central obesity.¹⁴

The third part of the survey comprise the KIDMED. KIDMED is a device developed in order to measure total diet quality, to assess nutrition habits in many aspects and to follow diet quality continually. The answers with a positive connotation in relation to the MD are assigned a value of +1 (12 items - 1., 2., 3.,

4., 5., 7., 8., 9., 10., 11., 13. and 15), and those with a negative connotation, a value of - 1 (4 items - 6., 12., 14. and 16.). The overall score can range from - 4 to 12. Total KIDMED scores were categorized 3 groups. These are ≤ 3 reflects a poor adherence (very low diet quality), 4–7 an average adherence (improvement needed to adjust intake to MD patterns), and ≥ 8 a good adherence to the MD (optimal diet quality).^{15,16}

Statistical analyses: All data were evaluated using the SPSS 21.0 package program. Counts, percentage (%), and median, interquartile range values were taken to evaluate of the data. The chi-squared test was used evaluating differences between categorical variables. The significance level was taken as $p < 0.05$.

RESULTS

Distribution of median values of anthropometric measurements by gender are shown in [Table 1](#). There were 510 university students, 60.2 % female ($n=307$), enrolled in the study, with an average age of 21 years. For female and male students, median body weight was 56 and 72,5 kg, median height 162 and 178 cm, median WC was 71 and 81 cm, median HC was 96 and 101 cm, median MUAC was 26 and 30 cm, respectively. Thus, for female and male students their calculated median BMI, WHR and WHtR was 21.2 and 23.2 kg/m², 0.73 and 0.81, and 0.43 and 0.45 respectively ([Table 1](#)).

WC ≥ 94 and ≥ 80 cm for male and female, respectively and ≥ 102 and ≥ 88 cm, respectively was defined as overweight and obese.¹² A significant difference was found according to height, weight, BMI, WC, HC, WHR, WHtR and MUAC between male and female ($p < 0.001$).

The mean score on the 'KIDMED' was 4.0 ± 2.6 among the whole group. The adherence of Mediterranean Diet (AMD) was poor in 37.3%, medium in 53.3% and high in 9.4% of the students. There was no statistically significant differences according to KIDMED groups between male and female ($p > 0.05$). [Table 2](#) shows the distribution of gender, age and place of residence and some anthropometric measurements according to KIDMED scores.

A significant difference was found between BMI and KIDMED groups ($p = 0.033$). According to BMI, 27.2% of overweight students and 28.6% of obese students have poor ADM. 64.2% of overweight students and 57.1% of obese student have medium ADM.

Distribution of 'yes' answers by gender and BMI

values is given in [Table 3](#). According to KIDMED items the prevalence of "yes" answer was analyzed in gender and BMI group subcategories. Yes answer to KIDMED items 3, 6 and 10 is higher for women than men ($p < 0.05$). Yes answer to KIDMED item 5 is also higher in males than females ($p = 0.070$). overweight and obese (OWB) consumed more frequently fruit twice a day than normal weight (NW) ($p = 0.020$). OWB consumed less cereals or grains for breakfast than NW ($p = 0.023$).

DISCUSSION AND CONCLUSION

In our study, university students' AMD with the KIDMED was evaluated and its relationship with anthropometric measurements and some demographic characteristics such as age and gender were examined. The mean score on the 'KIDMED' was 4.0 ± 2.6 among the whole group. The AMD was poor in 37.3%, medium in 53.3% and high in 9.4% of the students.

In the study by Baydemir et al.,¹⁷ the KIDMED score was 3.8 ± 1.9 among 354 medical students in Turkey. Some specific unhealthy food choices are more widespread such as consumption of fast-food (39.6%), 'sweets or candy several times every day (66.1%), pasta or rice almost every day (59.0%), commercially baked goods or pastries for breakfast (55.1%).¹⁷

In a study conducted with 193 university students in Cyprus, it was found that 26.9% had high AMD and 21.8% had poor AMD.¹⁸ Approximately 32% of the participants eating "a second portion of fruit and vegetables more than once a day", while 26% of the students consumed "more than one fast-food" and 31% consumed "sweets and sugar several times a day".¹⁸ In our study, it was found that only 10% of the students consumed fish regularly, 25.3% a second fruit and 30.3% a second vegetable a day. Another study of 726 university students conducted in Spanish showed that they moved away from the MD model by reducing their consumption of vegetables, fish, whole grains and olive oil and increasing their meat consumption.¹⁹

Healthy food selection also varies according to gender.¹⁹ In our study "Consumption of raw or cooked vegetables > 1 times a day", "Consumption of nuts regularly (at least 2–3 times per week)" and "Eating > 1 time per week to a fast-food (hamburger) restaurant" is significantly higher in females than in males. "Regular consumption of fish (at least 2-3 times a week)" is significantly higher in males than females ($p < 0.05$). Overweight and Obese (OWB) consumed

more frequently fruit twice a day than normal weight (NW) ($p=0.020$). OWB consumed less cereals or grains for breakfast than NW ($p=0.023$). Eating breakfast and consuming whole grain products for breakfast are among the healthy eating habits. Consuming fresh fruit is important in maintaining health with its vitamins and minerals, fiber and antioxidant content. However, considering the energy and sugar content, it should be consumed in the recommended amount.

In a study conducted with Italian university students, it was determined that 44% consumed an average of at least one serving of fruit a day and 22.5% consumed at least two servings of vegetables a day. Especially, 49.1% of women reached the recommended fruit consumption, while only 33.8% of men reached it. It was also found that 12.0% of men and 27.7% of women consumed at least two servings of vegetables a day.²⁰

In our study, it was determined that compliance with the MD was associated with BMI values but no relationship WC and WHtR. In a study evaluating the AMD of 570 university students, it was stated that the frequency of low AMD among overweight students was significantly higher than those with NW (15.5% vs 8.5%).²¹ Another study conducted 1717 European adolescents, Adherence to the MD did not influence the condition of over waist circumference, overfat and overweight, although certain dietary habits were identified as risk factors for their development.²²

The place of residence is one of the important factors affecting the eating habits of university students. On the other hand in our study among AMD and place of residence was no relationship. However in a study conducted in Greece, it was found that the eating habits of those living family home in the university did not change but those living alone or with friends developed unhealthy eating habits. Especially it has been determined that the consumption of fresh fruits, cooked and raw vegetables, fatty fish, seafood, pulses and olive oil decreased, and the consumption of sugar, wine, alcohol and fast food increased.²³

In conclusion, we observed poor adherence to the MD in university students. Eating at fast-food restaurants, intake of processed foods and sweets are the main unhealthy choices. Additionally, low-consumption vegetables and fruits and fatty fish are dietary habits that bring university students closer to the Western Diet. Gender and BMI value are important in determining healthy food preferences. In this

period, informing individuals about healthy nutrition is very important for healthy food choices.

Ethics Committee Approval: The study approved by Osmaniye Korkut Ata University Ethics Committee (Date: 29/11/2019, decision no: 30867).

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Table 1. Distribution of median values of anthropometric measurements by gender.

	FEMALE(n=307)	MALE (n=203)	TOTAL	p*
	Median [IQR]	Median [IQR]	Median [IQR]	
Age	21 [2]	20 [10]	21 [2]	<0.001
Weight (kg)	56 [10]	72.5 [16.7]	62 [18]	<0.001
Height (cm)	162 [7.5]	178 [9]	168 [15]	<0.001
BMI (kg/m2)	21.2 [3.5]	23.2 [4.2]	21.9 [4.4]	<0.001
WC (cm)	71 [8]	81 [11]	75 [12]	<0.001
HC (cm)	96 [8]	101 [9]	98 [10]	<0.001
WHR	0.73 [0.06]	0.81 [0.06]	0.76 [0.08]	<0.001
WHtR	0.43 [0.05]	0.45 [0.06]	0.44 [0.06]	<0.001
MUAC (cm)	26 [4]	30 [5]	27.5 [5]	<0.001

Mann Whitney U test; *Comparison of groups in the same line; BMI: Body Mass Index; WC :Waist circumference(cm); HC:Hip circumference (cm); WHR:Waist/hip ratio; WHtR:Waist/height ratio; MUAC:Mid-upper arm circumference.

Table 2. Distribution of gender, age and place of residence and some anthropometric measurements according to KIDMED scores.

	Poor		Medium		Good		Total		p
	n	%	n	%	n	%	n	%	
Gender									
Female	116	37.8	164	53.4	27	8.8	307	60.2	0.831
Male	74	36.5	108	53.2	21	10.3	203	39.8	
Total	190	37.3	272	53.3	48	9.4	510	100	
Age									
≤20	98	38.4	132	51.8	25	9.8	255	50.0	0.814
21-22	76	37.3	107	52.5	21	10.3	204	40.0	
23-24	16	31.4	33	64.7	2	3.9	51	10.0	
Place of residence									
Family together	26	33.3	42	53.8	10	12.8	78	15.3	0.379
Alone at home	23	37.7	33	54.1	5	8.2	61	12.0	
Friends together	54	39.1	72	52.2	12	8.7	138	27.1	
At dorm	87	37.3	125	53.6	21	9	233	45.7	
BMI (kg/m2)									
< 18.5	20	44.4	23	51.1	2	4.4	45	8.8	0.033
18.50-24.99	142	39.1	185	51	36	9.9	363	71.2	
25.00-29.99	22	27.2	52	64.2	7	8.6	81	15.9	
≥30.00	6	28.6	12	57.1	3	14.3	21	4.1	
WC (Female)									
< 80	23	8.4	144	52.7	106	38.8	273	88.9	0.159
80-88	2	8	15	60	8	32	25	8.2	
≥ 88	2	22.2	5	55.6	2	22.2	9	2.9	
WC (Male)									
< 94	67	37.6	92	51.7	19	10.7	178	87.7	0.505
94-102	5	31.3	10	62.5	1	6.3	16	7.9	
≥ 102	2	22.2	6	66.7	1	11.1	9	4.4	
WHtR									
<0.4	20	33.9	30	50.8	9	15.3	59	11.6	0.476
≥0.4-0.5	144	38.1	201	53.2	33	8.7	378	74.1	
≥0.5	26	35.6	41	56.2	6	8.2	73	24.3	

Pearson chi-square test; p* < 0.05; BMI: Body Mass Index; WC: Waist circumference(cm); WHtR: Waist/height ratio.

Table 3. Distribution of ‘yes’ answers by gender and BMI values.

	GENDER						BMI values				p	
	FEMALE (n=307)		MALE (n=203)		TOTAL		NW		OWB			
	n	%	n	%	n	%	n	%	n	%		
KIDMED items												
Consumption of a fruit or a fruit juice every day ¹	123	60.9	79	39.1	202	39.6	138	38.0	42	41.2	p ¹ =0.434 p ² =0.563	
Consumption of a second fruit every day ²	73	56.6	56	43.4	129	25.3	80	22.1	34	33.3	p ¹ =0.185 p ² =0.185	
Consumption of raw or cooked vegetables 1 time a day ³	168	64.9	91	35.1	259	50.8	190	52.3	45	44.1	p¹=0.018 p ² =0.142	
Consumption of raw or cooked vegetables >1 time a day ⁴	101	64.7	55	35.3	156	30.6	116	32.0	31	34.0	p ¹ =0.097 p ² =0.764	
Consumption of fish regularly (at least 2-3 times a week) ⁵	22	43.1	29	56.9	51	10	34	9.4	12	11.8	p ¹ =0.070 p ² =0.473	
Eating >1 time per week to a fast-food (hamburger) restaurant ⁶	109	54	93	46	202	39.6	148	40.8	33	32.4	p¹=0.013 p ² =0.123	
Consumption of beans >1 time per week ⁷	235	59.9	157	40.1	392	76.9	281	77.4	81	79.4	p ¹ =0.462 p ² =0.667	
Consumption of pasta or rice almost every day (5 times a week) ⁸	170	56.5	131	43.5	301	59	221	60.9	52	51.0	p ¹ =0.240 p ² =0.073	
Consumption of cereals or grains (bread, etc.) for breakfast ⁹	215	60.7	139	39.3	354	69.4	260	71.6	61	59.8	p ¹ =0.390 p ² =0.023	
Consumption of nuts regularly (at least 2-3 times per week) ¹⁰	159	54.1	135	45.9	294	57.6	201	55.4	61	59.8	p¹=0.001 p ² =0.425	
Consumption of olive oil at home ¹¹	212	60.4	139	39.6	351	68.8	241	66.4	77	75.5	p¹=0.483 p ² =0.081	
Skipping breakfast ¹²	60	55	49	45	109	21.4	76	20.9	22	21.6	p ¹ =0.130 p ² =0.890	
Consumption of a dairy product for breakfast (yoghurts, milk, etc.) ¹³	173	57.1	130	42.9	303	59.4	209	57.6	69	67.6	p ¹ =0.050 p ² =0.067	
Consumption of commercially baked goods or pastries for breakfast ¹⁴	166	59.1	115	40.9	281	55.1	202	55.6	52	51.0	p ¹ =0.315 p ² =0.403	
Consumption of 2 yoghurts and/or cheese (40 g) daily ¹	199	60.7	129	39.3	328	64.3	230	63.4	73	71.6	p ¹ =0.420 p ² =0.124	
Consumption of sweets or candy several times every day ^{2,15}	206	61.1	131	38.9	337	66.1	234	64.5	69	67.6	p ¹ =0.420 p ² =0.551	

Pearson chi-square test; p* $<$ 0.05; Numbers and percentages are referred to ‘yes’ answers; Bold numbers are those significant in the chi-square test; NW: Normal-weight; OWB: Overweight + obese; p¹: Gender; p²: BMI values.