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EVALUATION OF NUTRITIONAL HABITS OF ADULT FEMALE INDIVIDUALS

YETİŞKİN KADIN BİREYLERİN BESLENME ALIŞKANLIKLARININ DEĞERLENDİRİLMESİ

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ABSTRACT

Objective: The purpose of this study was to evaluate the nutritional habits of adult female individuals.

Materials and Method: The study was conducted with 75 healthy female volunteers between the ages of 24-35 who were full-time academic faculty members at Istanbul Aydın University. General characteristics of the individuals, nutritional habits, anthropometric measurements as well as quantified food consumption and food consumption frequency were recorded by using previous month's food consumption. The intake levels of energy, macro and micronutrients were calculated using the "Nutrition Information System software" (Ebispro for Windows - Turkish version 8.2) program and compared with the Daily Recommended Intake (DRI) amounts.

Results: Regarding eating habits, it was determined that 70.7% of participants consumed 3 main meals a day, and 40% of them consumed 1 snack per day. It was determined that 68% of the individuals never skipped a main meal, 54.2% of those who skipped the main meal mostly skipped the morning meal, and 45.8% skipped meals because they did not wish to eat. The mean Body Mass Index (BMI) was 24.02±4.18 kg/m^2, the mean waist circumference was 80.04±11.34 cm, the mean hip circumference was 102.63±8.05 cm, the mean waist/hip circumference ratio was 0.77±0.070. It was determined that 36% of the individuals had insufficient energy intake, 53.3% had sufficient carbohydrate intake, 84.0% had sufficient protein intake, 97.3% had high intake of fat, and 22.7% of them had insufficient fiber intake. It was determined that 65.3% was sufficient in calcium intake, 50.7% was sufficient in iron intake and 58.7% was sufficient in zinc intake.

Conclusion: In order to maintain a healthy life and increase the quality of life it will be beneficial to train individuals on adequate-balanced and healthy nutrition and enable them to acquire healthy eating habits.

Keywords: Food consumption, Dietary habits, Body mass index, Adult female

ÖZ

Amaç: Bu çalışmada, kadın bireylerin beslenme alışkanlıklarının değerlendirilmesi amaçlanmıştır.

Gereç ve Yöntem: Çalışma İstanbul Aydın Üniversitesi'ne bağlı olan fakültelerdeki akademik kadrolarda tam zamanlı olarak görev yapan 24-35 yaş aralığında gönüllü 75 sağlıklı kadın birey ile yürütülmüştür. Bireylere ait genel özellikler, beslenme alışkanlıkları, antropometrik ölçümleri ve son 1 aylık besin tüketim formu kullanılarak miktarlı besin tüketim sıklığı kayıtları alınmıştır. Enerji, makro ve mikro besin ögelerinin alım düzeylerinin belirlenmesi için 'Beslenme Bilgi Sistemi (BEBİS 8.2)' programı kullanılarak hesaplanmış ve Önerilen Günlük Alım miktarları ile karşılaştırılmıştır.

Bulgular: Bireylerin beslenme alışkanlıklarında; %70.7'sinin günde 3 ana öğün, %40'ının günde 1 ara öğün tükettikleri saptanmıştır. Bireylerin %68'sinin hiç ana öğün atlamadığı, ana öğün atlayanların %54.2'sinin en çok sabah öğününü atladığı, öğün atlama nedenlerinde %45.8'inin canı istemediği için öğün atladığı saptanmıştır. Beden Kütle İndeksi (BKİ) ortalamaları 24.02±4.18, bel çevresi ortalamaları 80.04±11.34, kalça çevresi ortalamaları 102.63±8.05, bel/kalça çevresi ortalamaları 0.77±0.070 olarak saptanmıştır. Bireylerin %36'sının enerji alımının yetersiz olduğu, %53.3'ünün karbonhidrat alımlarının yeterli, %84.0'ının protein alımlarının yeterli, %97.3'ünün de yağ alımlarının fazla olduğu, posa alım miktarlarının ise %22.7'sinde yetersiz olduğu saptanmıştır. Kalsiyum alımında %65.3'ünün, demir alımında %50.7'sinin ve çinko alımında ise %58.7'sinin yeterli olduğu saptanmıştır.

Sonuç: Yaşamın sağlıklı sürdürülmesi ve yaşam kalitesinin artırılması için; bireylere yeterli-dengeli ve sağlıklı beslenme konusunda eğitimler verilmesi sağlıklı beslenme alışkanlıklarının kazandırılması bakımından yararlı olacaktır.

Anahtar Kelimeler: Besin tüketimi, Diyet alışkanlıkları, Beden kütle indeksi, Yetişkin kadın

INTRODUCTION

According to the World Health Organization (WHO), health refers to a state of complete physical, spiritual and social well-being, in an individual [1]. Even though many factors are effective in maintaining and improving the state of health, it is possible to acquire the same with adequate and balanced nutrition [2,3]. Nutrition, which is both a physiological and psychosocial phenomenon, is under the influence of many factors [4]. In addition to individual factors such as gender, age, marital status, educational status, family structure, physiological and psychosocial status of individuals, many factors such as religion, cultural structure, socio-economic level, ecological and biological factors and globalization affect the food choice of individuals [5,6,7]. Adequate and balanced diet is the intake of sufficient amounts of energy

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and nutrients required for the growth, renewal and functioning of the body and their proper use in the body [2,8]. Nutritional habits play an important role in maintaining a healthy life [9]. The number of meals, the types and amounts of foods consumed in main and snack meals, the main characteristics of foods such as purchasing, preparation, cooking and serving, as well as behavior patterns such as consumption rates, consumption patterns, consumption differences that occur in different moods constitute the nutritional habits of individuals [10,11]. The professional life of individuals, constituting majority of society today, also plays an important role in nutrition and general lifestyles. In addition, working conditions of individuals also affect the status of their health [12]. The main factors being inadequacy of nutrition in terms of quantity and quality as well as lack of knowledge regarding choice of nutrients, time of meals, food preparation methods [13]. Individuals of all age groups, genders and professions should be trained about the importance of nutrition in health so that they can acquire balanced eating habits and an optimum lifestyle [14]. The main objective of this research was to evaluate the nutritional habits of adult females.

MATERIAL AND METHODS

The study was conducted between 12 December 2019-23 March 2020, with the approval of the Scientific Research and Publication Ethics Board of Istanbul Aydın University (dated September 29, 2019 No: 2019/254) on 75 healthy female individuals aged between 24-35 years who were full-time academic faculty members at Istanbul Aydın University. Participants were included in the study on a voluntary basis. Data was collected by means of questionnaires conducted by face-to-face interview method. Descriptive, documentary source analysis for literature review and statistical analysis methods were used for evaluation of the data. During face-to-face interview, the general characteristics of the individuals, dietary habits (main meal and snack consumption), anthropometric measurements, quantified food consumption and food consumption frequency using previous month's food consumption were recorded. The general questionnaire also included items such as gender, age, educational status, marital status, meals consumed and meal skipping status etc.

Anthropometric measurements

The TANITA MC780 device was used to determine the body weight of the individuals, an immobile stadiometer fixed on the ground with a sensitivity of 0.1 cm in accordance with international standards was used to determine the height (in meters). While recording measurements, care was taken so that the participant's feet were placed side by side, head was placed on the Frankfort Horizontal Plane and the occipital region touched the stadiometer. For waist and hip circumference, the participant was made to stand on his right side and a non-flexible measuring tape was used for measurement. For the waist, end point of the lowest rib and starting of the *Crista Iliaca* point just above the belly button is designated for measurement. As for the hip circumference the most protruding point of the hip (widest part of the buttocks) was taken. Care was taken not to compress the skin or loosen the tape during measurements. The amount of food consumption of individuals was determined using the food consumption frequency form of the previous month. "Food and Food Photo Catalog: Measures and Amounts" book was shown to the participants to determine the portion sizes of foods consumed [15]. The quantified amount of each food item consumed within the day was multiplied by the coefficient determined for each nutrient present in the food item and converted into the daily consumption amounts using the "Nutrition Information System software (Ebispro for windows - Turkish version 8.2)" program to determine the intake levels of energy, macro and micronutrients. The amount of energy, macro and micronutrients obtained was compared with the Recommended Daily Intake [16].

Statistical analysis

SPSS PASW 18 statistical package program was used to evaluate the data obtained in the study. Descriptive statistics were used to evaluate the data. Data regarding general characteristics and nutritional habits of participants were expressed in numbers (n) and as percentages (%). On the other hand, data regarding antropometric measurements and intake of nutrients were expressed as mean values ($\bar{x}$). Standard deviation (SD), minimum and RDI maximum values were also calculated.

RESULTS

The age group of 45.3% of the individuals included in the study were in the range of 24-29 years whereas, 54.7% were in the 30-35 years age group. Regarding the educational status of participants, it was determined that 54.7% had a master's degree and 45.3% had a doctorate degree. In relation to the nutritional habits of the participants, it was found that 70.7% of them consumed 3 main meals a day, and 40% consumed 1 snack per day. Sixty eight percent (68%) of the participants, did not miss main meal at all whereas, 29.3% skipped at least one main meal. Breakfast was the main meal which was skipped by most participants (54.2%). When the reason for skipping meals were enquired, 45.8% of the participants stated that they did so due to lack of appetite at that hour whereas, 33.3% stated that they skipped meals in order to lose weight (Table 1).

Table 1. General characteristics of individuals and their distribution according to eating habits

Characteristics	n	%
Age (year)		
24-29	34	45.3
30-35	41	54.7
Total	75	100
Educational Status		
Post Graduate (MS)	41	54.7
Doctorate (PhD)	34	45.3
Total	75	100
How many main meals do you consume in a day?		
1	2	2.7
2	20	26.7
3	53	70.7
Total	75	100
How many snacks do you consume in a day?		
1	30	40.0
2	17	22.7
3	16	21.3
None	12	16.0
Total	75	100
Do you skip a main meal?		
Yes	22	29.3
No	51	68.0
Sometimes	2	2.7
Total	75	100
Which main meal do you skip the most?		
Morning (breakfast)	13	54.2
Noon (lunch)	8	33.3
Evening (dinner)	3	12.5
Total	24	100
Why do you skip meals?		
I don't want (to eat)	11	45.8
I do not have time	4	16.7
I have no habit	1	4.2
To lose weight	8	33.3
Total	24	100

On evaluating the Body Mass Index (BMI) of the participants, 66.7% were found to be within the normal BMI range of 18.5-24.9 (kg/m^2), 22.7% of them were overweight within the range of 25.0-29.9 (kg/m^2) and 10.7% of them are found to be obese, belonging to the BMI range

of ≥30.0 (Table 2). Regarding anthropometric measurements of the individuals, mean height was determined to be 165.14±4.70 cm whereas, mean weight as 65.50±11.60 kg. The mean BMI was calculated to be 24.02±4.18 kg/m^2, mean waist circumference was 80.04±11.34 cm, mean hip circumference was 102.63±8.05 cm, and the mean waist/hip circumference ratio was calculated to be 0.77±0.070 (Table 3).

Table 2. BMI classification distribution of individuals

BMI Classification (kg/m^2)	n	%
18.5-24.9	50	66.7
25.0-29.9	17	22.7
≥30.0	8	10.7
Total	75	100

On evaluating the average daily energy and nutrient intake of individuals; mean energy intake levels of the participants were found to be 2469.40±1117.67 kcal. Mean carbohydrate intake (expressed as % of total calories consumed daily) was 35.49±8.41, mean protein intake as 15.17±4.19 %, mean fat intake as 48.39±8.81 %. The mean fiber intake of the participants were calculated as 29.58±19.37 g, calcium as 904.73±373.68 mg, iron as 13.92±7.03 mg, and the zinc as 12.16±6.18 mg. On comparing the energy, macronutrient and micronutrient intakes of the participants against the RDI (Recommended Dietary Intake), it was found that energy intake of 54.7% participants was sufficient, insufficient in 36% and excess in 9.3% was insufficient. As for macronutrients, carbohydrate intake was sufficient in 46.7% whereas insufficient in 53.3%, protein intake was sufficient in 84.0%, fat intake was high in 97.3%. Fiber intake was insufficient in 22.7%, sufficient in 38.7%, and excessive in 38.7%. Among the micronutrients, calcium intake was found to be sufficient in 65.3%, iron intake was sufficient in 50.7% and insufficient in 42.7%, and zinc intake was sufficient in 58.7% (Table 4).

Table 3. Mean ($\bar{x}$), standard deviation (SD), median and minimum-maximum values of anthropometric measurements of individuals.

Measurements	$\bar{x}$±SD (Minimum-Maximum)
Height (cm)	165.14±4.70 (150.0-174.0)
Weight (kg)	65.50±11.60 (43.0-103.0)
BMI (kg/m^2)	24.02±4.18 (18.70-37.70)
Waist circumference (cm)	80.04±11.34 (56.0-112.0)
Hip circumference (cm)	102.63±8.05 (86.0-128.0)
Waist/Hip Circumference	0.77±0.070 0.77±0.070

DISCUSSION

The inclusion of women in business life today has gained importance in the society from economic and social aspects due to their contribution in the professional field as well as to the economy of the family and the society, as a whole. The ability of women to fulfill the increasing responsibilities of business as well as family life has been a challenge and her role as a mother to raise healthy individuals for the society and to be productive at the job depends on her being in a state of complete health [17]. Basically, adequate and balanced nutrition is of great importance in maintaining a healthy life, in the prevention and treatment of diseases that may occur due to nutrition, and constitutes an important place in the general health of individuals [17,18]. The acquisition and practice of correct nutritional habits, which form the basis of adequate and balanced nutrition, affects health positively. Evaluation of the nutritional status of an individual is based on age, gender, special health conditions and the amount and food value of the items consumed in terms of nutrients and energy against the RDI. When evaluated as a whole, apart from the quality of food items - the number of meals taken in a day, skipping of meals, time span between meals, social, psychological and economic conditions that affect food preferences are also important in determining nutritional status of an individual [19]. In management of body weight, energy density of foods, total daily energy consumption are as important as the frequency of meals, regular meal consumption and adequacy and balance of each meal consumed by the individual [20,21]. Within the scope of adequate and balanced nutrition guide, it is recommended that adults consume 3 main meals and 3 snacks a day [21]. In this study, it was determined that 70.7% of individuals consumed 3 main meals a day, and 40% consumed 1 snack per day (Table 1). In a study performed by Stoke et al. [22], participants were reported to have consumed 3 main meals a day. In another study conducted by Bayramoğlu et al., it was found that 50% of female individuals consumed 3 main meals and 22.9% consumed more than 3 main meals [23]. In a study conducted by Birsen et al. [24], it was found that 82.0% of female individuals consumed 3 meals whereas in another study conducted by Yücecan et al. [25], 76.7% of the participants consumed 3 meals and 69.6% did not skip meals at all.

In line with studies regarding the meal which was skipped most [23], in this study the most frequently skipped meal was breakfast. In general, skipping meals cause the balance between energy and macronutrients to deteriorate, low micronutrient intake and consequently a decrease in diet quality. It has been reported that increased central obesity and insulin resistance are also associated with individuals who have been fed inadequate and unbalanced diet for a long time [26,27]. The consumption of less than 3 meals a day and the long interval between meals stimulate insulin response by causing individuals to consume large amounts of food, increase triglyceride synthesis, fat storage, and cause a decrease in the thermal effect of foods, resulting in a decrease in energy expenditure [28,29]. In context to skipping of meals, in this study, 68% of participants never skipped a main meal, 29.3% skipped a main meal, 54.2% of those who skipped meals did so during breakfast. The main reason for skipping meal was loss of appetite (45.8%) followed by the wish to lose weight (33.3%) (Table 1).

In a study conducted in USA; It was stated that 11% of adult individuals skipped breakfast between the years 1971-1975, and this rate increased to 18% between 2001-2002 [30]. Taskar et al., in their review study examining the NHANES data [31], reported that the rate of skipping breakfast in adults aged 20-39 was 25%. In the study conducted by Bayramoğlu et al. [23], regarding meal consumption of the individuals, it was stated that 71.4% skipped at least one meal and 28.6% did not skip meals at all. As for the skipped meal, it was determined that 31.4% skipped breakfast and 38.6% skipped lunch. On analyzing the reasons for skipping meals; it was reported that 47% of them did not have the opportunity, 14.3% of them did not have the habit of eating at that hour, 8.6% did not wish to eat, and 1.4% of them skipped meals to lose weight. In the same study, when looking at the consumption of snacks of individuals, it was reported that 31.4% of participants consumed snacks once a day, 41.4% of them twice a day [23]. In the study conducted by Karadağ et al. [32], it has been reported that 59.2% of the individuals consumed 3 main meals and 38.4% consumed 2 snacks. According to the Turkey Nutrition and Health Survey 2010 report; it was determined that 14.5% of the individuals skipped the morning meal, 14.5% skipped the lunch and 4.5% skipped the evening meal. It has been reported that 52.3% of the individuals who skipped the morning meal, 30.1% of those who skipped the lunch meal and 27.9% of the people who skipped the dinner or supper because they just did not wish to eat [33].

In this study, on evaluating the BMI classification distribution of individuals, it was found that 66.7% of participants were in the normal range of 18.5-24.9 (kg/m^2), 22.7% were overweight between 25.0-29.9 (kg/m^2) and 10.7% were in the obese range of ≥30.0 BMI (Table 2). In the study conducted by Şanlıer et al. [34], it was found that the BMI values of 60.3% of the female individuals were within the normal range

Table 4. Determination of daily energy, nutrient intake mean (x̄), standard deviation (SD), median and minimum-maximum values and RDI proficiency levels of individuals.

Intake	x̄±SD (Minimum-Maximum)	Insufficient (<67)		Sufficient (67-133)		Excess (>133)	
		n	%	n	%	n	%
Energy (kcal)	2469.40±1117.67 (1128.60-7103.60)	27	36.0	41	54.7	7	9.3
Carbohydrate (%)	35.49±8.41 (16.00-53.00)	40	53.3	35	46.7	-	-
Protein (%)	15.17±4.19 (10.00-37.00)	4	5.3	63	84.0	8	10.7
Fat (%)	48.39±8.81 (21.30-71.00)	-	-	2	2.7	73	97.3
Fiber/Pulp (g)	29.58±19.37 (4.00-122.40)	17	22.7	29	38.7	29	38.7
Calcium (mg)	904.73±373.68 (234.20-2399.90)	21	28.0	49	65.3	5	6.7
Iron (mg)	13.92±7.03 (4.30-41.40)	32	42.7	38	50.7	5	6.7
Zinc (mg)	12.16±6.18 (4.40-38.70)	7	9.3	44	58.7	24	32.0

and 6.4% of them were above 30. Body weight measurement is the most common measurement technique used to determine health and nutritional status of an individual. However, along with the improved measurement techniques, the examination of fat and lean tissue separately gives accurate results about body composition. Some new measurements such as BMI, waist circumference measurement, waist/hip ratio etc. are among the most practical of these [35]. BMI, waist circumference, waist/hip ratio and waist/height ratio are associated with the risks of chronic diseases such as cardiovascular diseases and type 2 diabetes [36,37]. Among the measurements used in the detection of obesity, waist circumference measurement of 88 cm and above, waist/hip ratio over 0.85 are the risk factors for obesity and chronic diseases in adult females [38]. In this study, the evaluation of anthropometric measurements reflected mean BMI of participants as 24.02±4.18 kg/m^2, the mean waist circumference as 80.04±11.34 cm, the mean hip circumference as 102.63±8.05 cm and mean waist/hip circumference as 0.77±0.070 (Table 3). In a study conducted in Australia, it was found that 58.2% of women had a BMI>25 kg/m^2 [39]. In another study conducted in Turkish adults, it was found that 25.45% of women were obese, 31.89% were overweight and 81.82% had a high waist/hip ratio [40].

In this study, the relationship between the nutrient values obtained from the daily food consumption of the individuals was compared against the recommended DRI (Daily Recommended Intake) levels. It was found that 54.7% of the individuals had sufficient energy intake, 53.3% had sufficient and 46.7% insufficient carbohydrate intake, 84.0% had sufficient protein intake and 97.3% had high fat intake (Table 4). In the study conducted by Yemişçi et al., it was reported that 75.8% of women met their energy intake but protein intake was below the daily recommended level [41]. In a different study, it was reported that individuals' carbohydrate, protein, and fat intake rates were 51.1%, 16.4%, and 33.3% of total caloric intake respectively [42]. In a study enquiring the nutritional habits of women, the daily energy intake was found to be 1572.9±541.8 kcal, protein 48.8±21.0 grams, fat 62.7±23.6 grams, carbohydrate 197.5±93.9 grams and fiber as 22.5±13.7 grams [43]. Again, according to the data obtained in another study on females, 1853±371 kcal energy, 57.1±19 g fat, 248.9±55.7 g carbohydrate 71.6±17.1 g protein, 16.2±5 g fiber were found to be consumed by the participants [44]. In this study, the average daily intake levels of individuals were found to be 2469.40±1117.67 kcal energy, 35.49±8.41 g carbohydrate, 15.17±4.19 g protein, 48.39±8.81 g fat and 29.58±19.37 g fiber (Table 4).

Compared to other studies, it was found that energy and fat intake rates were high in our present study. Regarding micronutrients, the mean calcium intake was 904.73±373.68 mg, iron intake was 13.92±7.03 mg and zinc intake was 12.16±6.18 mg (Table 4). In evaluating the adequacy levels of micronutrients, it was determined that 65.3% of participants were sufficient with respect to calcium intake, 50.7% were sufficient with respect to iron intake but 42.7% were insufficient and finally 58.7% were sufficient with respect to zinc intake (Table 4). In the study conducted by Dağ [45], it was reported that the average intake of calcium, iron and zinc of women was 590.5±283.16, 8.4±3.21 and 7.3±3.58 mg respectively and these intake levels were found to be insufficient as per recommended DRI for this group. In another study, it was found that the calcium and iron intake of female individuals was below the recommendations and the zinc intake was above the recommended DRI levels [41].

CONCLUSION

In order to ensure health and proper development in females it is of great importance to consume energy, macro and micronutrients in appropriate quantity and variety in accordance to age, gender and body weight needs in special circumstances. In addition, training of individuals on adequate and balanced nutrition, repetitions and evaluation of these trainings are essential in maintaining a quality and healthy lifestyle.

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