Research Article ISSN 2639-9326

Diabetes & its Complications

The Comparison of Healthy Eating Index Values of Female Patients 18-65 Years Applying To a Special Hospital Nutrition Diet Polyclinic: A Cross-Sectional Study

Meryem Gubur and Hulya Demir*

Yeditepe University, Faculty of Health Sciences Department of Nutrition and Dietetics, Turkey.

***Correspondence:**
Hulya Demir, Yeditepe University, Faculty of Health Sciences Department of Nutrition and Dietetics, Tel: 090 5332809520; E-mail: hdemir40@gmail.com.

Received: 02 November 2017; **Accepted:** 28 November 2017

Citation: Gubur M, Demir H. The Comparision of Healthy Eating Index Values of Female Patients 18-65 Years Applying to a Special Hospital Nutrition Diet Polyclinic. A Cross-Sectional Study. Diabetes Complications. 2017; 1(4): 1-7.

ABSTRACT

Aim: *In this study, diet quality of the female patients aged 18-65 with a body mass index (BMI) of 25-30 who applied to the polyclinic of Nutrition and Dietetics of a private hospital were compared with those of women with body mass index 30-40 using Healthy Eating Index (HEI-2010).*

Method: *The 24HDR (Twenty Four Hour Dietary Recall) was asked the participants to report everything that they consumed in the 24 hours prior to the survey. The data from the 24 hour recalls were analyzed using Nutrition Information System (BeBiS) program. This software was used to calculate total energy, macro- and micro-nutrient intakes. Dietary quality was assessed by means of the HEI-2010. In statistical analyses, frequency distributions, and percentage measurements were evaluated via chi-square test.*

Conclusions: *BMI 25-30 participants with a mean HEI score of 48.0 ± 12.5 and participants with a BMI of 30-40 had an HEI average score of 52.4 ± 13.9. %1 of the total respondents had good diet, 54% need to improvement it, and 45% had inadequate. In total participants, cereal, vegetables, fruit, milk, sodium and other nutritional component scores of HEI-2010 were found to be low in the overall population. The HEI value with the lowest score is the fruit, while the highest HEI value was found as total fatty acid. There was a significant difference in HEI scores according to their profession ($p<0.05$). As a result, there was no significant difference in the degree of comparison between the groups with BMI between 25-30 and 30-40 according to the total HEI scores, the total dietary quality in both groups need to be changed and improved.*

Keyword

Body mass index, Healthy eating index-2010, Nutrition.

Introduction

A balanced diet and consumption of food prepared in accordance with good dietary practices are factors that contribute to maintaining a healthy lifestyle [1]. Healthy eating can help reduce the risk of illnesses such as heart diseases, blood pressure, diabetes, osteoporosis, diabetes, various types of cancer. They also help to achieve a healthy body weight [2]. The lack of information, attitudes and behaviors about the foods and the fallacy of the foods constitute differences in the food consumption of the individuals. Inadequate or unbalanced nutrition can cause various health problems. Incorrect eating habits and over feeding also lead to many health problems such as obesity, cardiovascular diseases, hypertension, hypercholesterolemia and diabetes [3]. Obesity has reached epidemic proportions with more than one billion adults with globally obesity and is a major contributor to the global burden of chronic illness and disability. Obesity living in developing countries, usually with malnutrition, is a complex situation affecting almost all age and socio-economic groups with serious social and psychological dimensions [4].

The United States Department of Agriculture (USDA) establishes a food guide that converts the foods and nutrients recommended in the Dietary Guidelines for Americans (DGA) and the Dietary Reference Intakes (DRI) into actual food intakes. The food guide formed the basis for the Food Guide Pyramid and more recent guides, which are used to advise Americans on healthy eating [5]. The HEI was developed by three the USDA to provide a single summary of diet quality based on different aspects of a healthy diet. The USDA has used the HEI to assess diet quality in the general United States (US) population over time. The HEI has also been used to assess the association of diet quality with risk factors for chronic diseases [6]. The HEI developed using data from the 24HDR, is a summary measure of the main components of an individual‘s diet. It facilitates the assessment of a diet‘s quality, of either populations or groups of individuals [7]. The total HEI score provides a picture of overall dietary quality, while the component scores used to calculate the total HEI score offer an opportunity to study important components of dietary intake [8].

As diet is the cornerstone for maintaining health and for the management and prevention of a wide range of medical conditions, an understanding of the level of nutrition knowledge and its association with dietary quality is paramount. The specific influence of nutrition knowledge on dietary quality may be an important research question [9]. Therefore, the primary purpose of this study was to compare the diet quality of female patients 18-65 years applying to a Private Hospital Nutrition Diet Polyclinic by the use of HEI-2010.

Methods

Research type

This is a cross-sectional type of descriptive study.

Research Population and Sampling

In the designated period of on June 2016-December 2017 research population consisted of female patients who consult the Nutrition and Dietetic Polyclinic of a Private Hospital in Istanbul. Sampling of the study included BMI 25-30 and BMI 30-40. Women with ages 18-65 years with BMI 25-30 and BMI 30-40 will be included.

Inclusion and Exclusion Criteria of the Research

Inclusion Criteria:

- Submitting a written consent to be included in the research,
- Female patients aged 18-65 years,
- BMI 25-30 or BMI 30-40,
- Between the dates of June 2016-December 2017, the hospital’s dietary polyclinic.

Exclusion Criteria:

- Not submitting a written consent to be included in the research,
- Being outside the scope of designated research group,
- Incomplete responses to survey questions and inconsistent answers to conditional items in the form.

Data Collection Tools

Data of the research were collected by General Information Form and Frequency of Food Consumption Form (FFQ) prepared by the researchers. General Information Form was prepared by the researchers via literature analysis [10]. The 24HDR (Twenty Four Hour Dietary Recall) asks the participants to report everything that they have consumed in the 24 hours prior to the survey. This allows for a detailed look at the diet, which can be broken down and analysed at the level of the macro and micronutrient content of everything that was eaten. When conducting 24 hour recalls, a multiple pass technique should be used in order to help ensure the information given is accurate. There are generally four stages which include: first, obtain a complete list of all foods and beverages consumed in the last 24 hours; second, describe foods in as much detail as possible such as cooking methods and sauces added; thirdly, determine portion sizes using visual aids and prompts; and fourthly, review the recall to make sure all foods were recorded properly [10].

For the purpose of this study, the 24 hour recalls were used to determine the HEI score as well as determine the number of servings. The data from the 24 hour recalls were analyzed using Nutrition Information System (BeBiS) program. This software was used to calculate total energy, macro- and micro-nutrient intakes.

Data Analysis

In the analysis part, data were initially categorized and next the required codes were registered. On the designated sampling group, data collection forms were harnessed to glean the data required for the research and then these data were entered into (Statistical Package for the Social Sciences) SPSS 20.0 program. In statistical analyses were evaluated via chi-square test. In the entire conducted tests significance threshold value was taken as $p<0.05$.

Dietary Intake and Scoring System

Energy and nutrient intake were calculated by using the BeBiS program. The HEI-2010 was chosen as a validated tool for overall diet quality assessment. We used the recommended HEI criteria to define the diet quality as good‘ (a score of 80 and more), needs improvement‘ (a score between 51 and 80), and poor‘ (a score of 51 or less). In addition to the HEI, the HEI components as well as total energy intake and protein intake, and some other selected nutrients such as folic acid, fiber, iron, and calcium, were used to further assess female patients diet quality.

Ethical Dimensions of the Research

Approval of the ethical board will be asked for.

Voluntary participation will be the inclusion criteria for the subjects. Voluntariness form will be explained to the participants before receiving their consents, and they will be explained about the freedom to quit the research without any excuses.

Results

Eighty female patients completed the questionnaires, 24 HDR and antropometric date collection in Private Hospital Diet Polyclinic in Istanbul. Participants are seperated two groups as overweight (BMI 25-30) and obese (BMI 30-40). In table 1, BMI 25-30 is shown minimum, maximum and mean value of age, menarche,

total number of pregnancies, body weight, height, body mass index, waist hip ratio, body fat mass, and body water mass. The same values are shown for BMI 30-40 in table 2.

	N	Minimum	Maximum	Mean	Std. Deviation
Age	39	18	62	34.6	10.5
Menarch	39	11.0	15.0	12.7	.9
Total number of preg.	39	0.0	4.0	1.3	1.1
Bodyweight (kg)	39	58.5	89.9	73.5	5.7
Heights(m)	39	150.0	175.0	162.6	5.8
BMI	39	25.3	29.4	30.3	16.3
Waist/Hip	39	0.7	0.9	0.8	0.03
Body fat mass(kg)	39	20.1	34.1	25.7	2.8
Body fa tmass(%)	39	27.6	39.6	34.9	2.2
Body wate rmass	39	27.6	41.2	34.3	2.6
Valid N (listwise)	39				

Table 1: Sample characteristics of individuals with body mass index between 25-30.

	N	Minimum	Maximum	Mean	Std. Deviation
Age	41	18	62	35.6	12.1
Menarch	41	11.0	15.0	13.0	0.9
Total number of preg.	41	0.0	6.0	1.4	1.3
Body weight(kg)	41	67.9	112.6	85.5	9.5
Heights(m)	41	151.0	176.0	159.7	5.5
BMI	41	29.3	39.5	33.4	2.8
Waist/Hip	41	0.8	0.9	0.9	0.0
Bodyfatmass(kg)	41	25.8	46.8	34.7	5.3
Bodyfatmass(%)	41	35.4	46.9	40.4	2.4
Bodywatermass	41	30.3	47.4	36.6	3.4
Valid N (listwise)	41				

Table 2: Sample characteristics of individuals with body mass index between 30-40.

In our study, the mean age (Mean ± S) was 34.6 ± 10.5 in the BMI 25-30 and 35.6 ± 12.1 in the BMI 30-40. The mean age of menarche (Mean ± S) was 12.7 ± 0.9 for those with BMI 25-30 and 13.0 ± 0.9 for those with BMI 30-40. The body weight (kg) was 73.5 ± 5.7 for those with BMI 25-30 and 85.5 ± 9.5 for those with BMI 30-40, the mean lengths (m) of BMI 25-30 were 162.6 ± 5.8 and those of BMI 30-40 were 159.7 ± 5.6. Waist-to-hip ratios are 0.8 ± 0.03 for BMI 25-30 and 0.9 ± 0.04 for BMI 30-40 (Table1, Table 2).

In the study examined the educational status of 39 individuals with BMI between 25-30 participating. 20.5% of these individuals was primary school, 25.7% was license graduate, 25.6% was high school graduate, 15.4% was middle school, 10.3% was pre-license and 2.6% was high license graduates. The 9.8 % of 41 individuals between BMI 30-40 participating was in pre-license, 12.2% in license, 17.1% in middle school, 22.0% in primary school and 39.0% in high school.

When individuals with BMI between 25-30 were evaluated according to occupational groups, 2.6% of the individuals are retired, 5.1% are civil servants, 12.8% are self-employed, 38.5% are other, and 41%are housewives. In addition, when the BMI is between 30-40 according to the occupational groups, 2.4% are civil servants, 7.3% are unemployed, 7.3% are self-employed, 9.8% are retired, 31.7% are in the other prossion group and 41.5% are housewives. When the distributions according to the marital status of the individuals with BMI between 25-30 are examined, 30.8% of the individuals were single, and 69.2% were married. According to BMI between 30-40, 34.1% of the individuals were single, and 65.9% were married.

In addition to the HEI ve the HEI components; total energy and protein intake, and some other selected nutrients such as folic acid, fiber, iron, and calcium, were assessed in this study. The intakes of those nutrients according to BMI 25-30 in table 3 and BMI 30-40 can be seen in table 4.

	N	Minimum	Maximum	Mean	Std. Deviation
Energy	39	464.3	2713.9	1304.8	533.7
Protein	39	20.3	90.8	50.3	20.8
Folic acid	39	83.3	725.8	230.5	107.0
Fiber	39	3.9	66.4	18.9	10.6
Calcium	39	109.3	1517.8	590.4	314.5
Iron	39	4.1	47.4	10.1	7.3
Valid N (list wise)	39				

Table 3: Total energy, protein and other selected nutrients intake in BMI 25-30.

	N	Minimum	Maximum	Mean	Std. Deviation
Energy	41	426.0	4814.1	1424.2	873.9
Protein	41	16.0	199.7	62.9	42.5
Folic acid	41	102.8	836.5	261.0	153.1
Fiber	41	5.9	51.2	19.8	10.1
Calcium	41	130.9	3097.3	625.1	495.9
Iron	41	3.0	23.5	9.6	4.8
Valid N (list wise)	41				

Table 4: Total energy, protein and other selected nutrients intake in BMI 30-40.

The energy intake level was mean (Mean ± S) 1304.8 ± 533.7 kcal in BMI 25-30 years, mean (Mean ± S) 1424.2 ± 873.9 kcal in BMI 30-40 years. The energy intake level of those with BMI 30-40 was higher than the BMI 20-30. The mean protein intake of

patients with BMI 20-30 was 50.3 ± 20.8, while that of BMI 30-40 was 62.9 ± 42.5. Folic acid consumption levels was higher in those with BMI 30-40. Daily iron intake from minerals was high in BMI 25-30, especially calcium intake which is important for bone development was found to be low in all patients. Although fibrous nutrition is extremely important for health, daily fiber intake seems to be low.

Total HEI score was calculated for each of the 80 individuals. The mean of total HEI score and mean scores for each of food categories were calculated. Mean of total HEI score and mean scores for each of the food category can be found in tables 5 and 6.

Nutritional status was assessed according to the HEI-2010 index by scoring over 1000 kcal Nutritional Status of Patients.

	N	Minimum	Maximum	Mean	Std. Deviation
Grain	39	0	10	4.8	4.7
Vegetables	39	0	5	3.2	1.7
Fruits	39	0	10	2.0	2.4
Dairy products	39	0	10	2.6	3.8
Total fatty acids	39	1.2	10	6.0	2.6
Others	39	0	10	3.2	3.9
Total HEI	39	7.6	69.4	48.0	12.5
Valid N (list wise)	39				

Tablo 5: Total HEI score and mean scores for components of the HEI in BMI 25-30.

	N	Minimum	Maximum	Mean	Std. Deviation
Grain	41	0	10	3.8	4.6
Vegetables	41	0	5	3.1	1.7
Fruits	41	0	9.7	2.1	2.4
Dairy products	41	0	10	2.9	3.8
Total fatty acids	41	1.6	10	6.1	2.1
Others	41	0	10	3.3	4.0
Total HEI	41	7.6	81.6	52.4	13.9
Valid N (list wise)	41				

Table 6: Total HEI score and mean scores for components of the HEI in BMI 30-40.

Average values of the component scores are shown in Table 6 and Table 7. When the values were examined, it was seen that the highest value of BMI 25-30 (Mean ± S) was 6.0 ± 2.6 with total fatty acid and the lowest value was with fruit 2.0 ± 2.4. The highest value of BMI 30-40 (Mean ± S) is 6.1 ± 2.1 total fatty acid and the lowest value was with fruit 2.1 ± 2.4.

Comparision with Healthy Eating Index

The HEI-2010 score is above 80, the diet is classified as 'good, quality' 51-80, the diet 'needs improvement' and below 51, the diet is 'inadequate' [12].

When the total HEI-2010 scores obtained by these criteria were compared, 56.4% of the patients with BMI 25-30 had HEI score <51, 43.6% had HEI score 51-80, 51.2% of those with BMI 30-40 had HEI score < 51, 46.3% had a HEI score of 51-80 and 2.4% had an HEI score of 80. As a result of the analysis made, HEI groups did not differ significantly according to BMI (X2 = 1.085, p> 0.05) (Table 8).

		HEI grup			Total	x^2	p
		< 51	51-80	>80			
BMI grup	25-30 BMI	22 (%56,4)	17 (%43,6)	0	39		
	30-40 BMI	21 (%51,2)	19 (%46,3)	1 (%2,4)	41	1.085	0.58
Total		43 (%53,8)	36 (%45)	1 (%1,3)	80		

Table 7: Comparison of HEI groups according to BMI.

	BMI	N	Mean	Ss	Std error mean	t	P
HEI score	25-30	39	48.0	12.5	2.00	-1.477	0.14
	30-40	41	52.4	13.9	2.17		

Table 8: Comparison of HEI score by BMI.

In Table 9 is shown the total HEI score differs according to the BMI values. As a result of the analysis made, it is seen that the HEI scores do not differ according to the BMI values (t=-1.477, p>0.05).

		HEI grup			Total	x^2	P
		< 51	51-80	>80			
Occupation	Housewife	16 (%48.5)	17 (%51.5)	0 (%0)	33	30.012	0.001
	Officer	2 (%66.7)	1 (%33.3)	0 (%0)	3		
	Self-employment	5 (%62.5)	3 (%37.5)	0 (%0)	8		
	Retired	2 (%40)	3 (%60)	0 (%0)	5		
	Unemployment	0 (%0)	2 (%66.7)	1 (%33.3)	3		
	Other	18 (%64.3)	10 (%35.7)	0 (%0)	28		
Total		43 (%53.8)	36 (%45.0)	1 (%1.3)	80		

Table 9: Comparison of HEI groups according to occupation.

In Table 10 is shown chi-square analysis for comparison of HEI groups according to their occupation. As a result of the analysis made, there was a significant difference between the HEI groups according to their professions (X2=30.012, p<0.05).

	BMI	N	Mean	Ss	Std error mean	t	P
Grain	25-30	39	4.8	4.7	0.7	0.944	0.34
	30-40	41	3.8	4.6	0.7		
Vegetable	25-30	39	3.2	1.7	0.2	0.381	0.70
	30-40	41	3.1	1.7	0.2		
Fruits	25-30	39	2.0	2.4	0.3	-0.175	0.86
	30-40	41	2.1	2.4	0.3		
Milk product	25-30	39	4.4	3.3	0.5	0.277	0.78
	30-40	41	4.2	3.2	0.5		
Sodium	25-30	39	2.60	3.87	0.62	-0.342	0.73
	30-40	41	2.90	3.83	0.59		
Total fatty acid	25-30	39	6.09	2.69	0.43	-0.131	0.89
	30-40	41	6.16	2.14	0.33		

Tablo 10: Comparison of component scores according to BMI.

48.5% of the housewives were below 51 HEI, 51.5% were in the HEI range of 51-80; 66.7% of the officers were under 51 HEI, 33.3% were in the 51-80 HEI range; 62.5% of the self-employed were below 51 HEI, 37.5% were at 51-80 HEI; 40% of the retired were under 51 HEI, 60% were in the 51-80 HEI range; 66.7% of the unemployed were in the range of 51-80 HEI and 33.3% were over 80 HEI. 64.3% of the other occupational health professionals participating in the survey were under 51 HEI and 35% were in the 51-80 HEI range. When all occupations are considered together, it is observed that 53.8% of them were under 51 HEI, 45% of them were in 51-80 HEI range, and 1.3% were over 80 HEI.

When the component scores according to BMI were compared, the mean scores (Mean ± S) of those with BMI 25-30 were 4.7 ± 0.7 cereal, 3.2 ± 1.7 fruit, 2.0 ± 2.4 fruit, 4.4 ± 3.3 milk, 2.6 ± 3.8 sodium, the mean scores (Mean ± S) were 3.8 ± 4.6, 3.1 ± 1.7 fruit, 2.1 ± 2.4 fruit, 4.2 ± 3.2 milk, 2.9 ± 3.8 sodium and 6.1 ± 2.1 total fatty acids for those with a BMI of 30-40. In Table 10, it is seen that cereal, vegetable, fruit, milk, sodium, total fatty acid scores did not differ in the t test which was done to find out whether the component scores differed according to BMI (p>0.05).

Discussion

The HEI is a measure of nutritional quality in compliance with the Dietary Guidelines for Americans, which are specifically the nutrition policy for the United States government and the foundation of all federal nutrition guidelines [12]. The USDA Food Patterns are used to establish the scoring standards for the HEI. In addition to the USDA Food Patterns, the 2005 and the 2010 editions of the Dietary Guidelines contained the Dietary Approaches to Stop Hypertension (DASH) Eating Plan as an another example of a dietary plan which exemplifies dietary terms of the Dietary Guidelines [13].

The USDA and U.S. Department of Health and Human Services publish the Dietary Guidelines every 5 years. The last revision of HEI was to show the 2005 edition of the Dietary Guidelines [14]. The edition of the 2010 Dietary Guidelines and revised USDA Food Patterns required an update to the HEI-2005 with the purpose of grasping the most important changes, such as the addition of seafood (fish and shellfish) recommendations and refined grain limitations. This index is more concerned with the amount of diet than diet quality and gives each standard per energy. That is, 1000 kcal is calculated over the amounts that must be energized [15].

In our study, some comparisons were made with the use of HEI groups which were <51, 51-80 and >80. There were no significant results in comparison made between overweigh and obese females. These results also showed that there were no differences in the diet quality of those populations according to their HEI groups. There was a significant difference between the HEI scores only in the participants' occupations (p<0.05). Individuals with high educational status were expected to have better dietary qualities. The lack of significant differences between HEI scores and educational attainment means that individuals with different educational backgrounds are not better than the dietary qualities.

This study results demostrate that HEI scores did not differ significantly according to BMI (p>0.05). In addition obese females' overall diet quality was better than overweight females'diet quality because mean of total HEI score of obese females was 52.4+13.9 and mean of total HEI score of overweight females was 48.0+12.5. In conclusion, if there is no a significant difference in the BMI between the groups between 25-30 and 30-40 according to total HEI scores, the total dietary quality needs to be changed and improved in both groups.

On the other study, nutritional status of individuals aged 19-35 was determined by healthy eating index (HEI-2005). The difference between the HEI-2005 averages of the students in terms of sex was found to be statistically significant (p<0.05). Women's HEI-2005 score was higher than men's. The fact that women's consumption of vegetables and fruits is higher than that of men has led to a slightly higher HEI-2005 score [16]. In a study conducted in pre-school children in Greece, the HEI score was found to be significantly higher in boys than in girls [17]. In a study of cardiovascular risk factors in French dietary quality measurement, the HEI score was high in elderly, married, well-educated, physically active, and no-smoking subjects, but no difference by sex [17]. In same study, the HEI-2005 score was found to be higher in elderly individuals. Similar to this study, the majority of students in the 19-25 age group are in acceptable nutrition (69.3% for males and 85.1% for females) [17].

Comparisons of the other component scores of the HEI between

two groups were not found to be statistically significant but there were found some differences. Compared with obese females, overweight females scored lower on the fruit, milk, total fatty acids, other foods components of the HEI: an average of 2.0 on the fruit, 2.6 on the milk, 6.1 on the total fatty acis, and 3.2 on others foods components, compared with 2.1, 2.9, 6.1, 3.3 respectively. For obese females. Compared with obese females, overweight females scored higher on grain and vegetables components of the HEI: an average of 4.8 on the grain and 3.2 on the vegetables, compared with 3.8 and 3.1, respectively, for obese females.

Micronutrients have a primary function in human metabolism and physiology to protect, improve and prevent disease [18]. Although the Dietary Reference Intakes (DRI) of iron for females at 19-30 years is 18 mg, at 31-50 years is 18 mg and 51-70 years 8 mg [19]. In our study, mean iron consumption of overweight females was found 10.1 mg and mean iron consumption of obese females was found 9.6 mg which were below the recommendation.In addition, although the DRI of calcium for females at 19-30 years is 1000 mg, at 31-50 years is 1000 mg and 51-70 years is 1200 mg (www.nap.edu, 2005), in our study, mean calcium intakes of overweight and obese females were found below the recommendation: 590.4 mg in overweight females and 625.1 mg in obese females. Moreover, although folic acid both females is 400µg [20], in our study, folic acid intakes of both groups were below the recommendation: 230,5 µg in overweight females and 261.0 µg in obese females. Furthermore, although the DRI of fiber for females at 19-30 yeras is 25g and at 31-50 is 25 g, and at 51-70 is 21 g [21], in our study, mean fiber intakes of overweight female were 18.9 g and mean fiber intakes of obese females were 19.8 which were found below the recommendations. The DRI of protein for females at 19-30 years is 46 g per day, at 31-50 years is 46 g per day and 51-70 years 46 g per day [21], in our study, mean protein consumption of overweight females was found 50.3 g and mean protein consumption of obese females was found 62.9 g which were above the recommendation.

In a study of 209 healthy women, a questionnaire was administered to determine general information, eating habits, feeding frequency, 24-hour recall and attendance to exercise and energy and nutrient intake, and statistical tests using computer software programs (BEBIS 6.1, SPSS 16.0) was applied. Carbohydrate, protein, fat, vitamins A, K, C, phosphorus, vitamin E, D, B1, folic acid, calcium, iron, iodine, fluoride, magnesium, copper and potassium intake is lower than daily values of fiber, manganese and sodium intakes were found to be above the DRI values [22].

Istanbul University, Faculty of Medicine was applied to students who had a mean age of 18.4 ± 0.9 years in a study conducted with 878 students whose first grade was 39.4% female and 60.6% male. Anthropometric measurements were made and final determined by 24-hour food consumption, analysis of nutrients was done using BEBIS program. The data obtained were compared with those of Turkey. Compared with the recommendations, all students were found to have fiber, B1 vitamins, folic acid, calcium and magnesium, and girls had low iron [23].

In our study, we have stated that women do not consume in their diets, cereals, vegetables, fruits, milk, sodium and some other food groups in the correct amounts. Inadequate intake of micronutrients such as iron, calcium, folic acid and fiber is seen. In addition, the results of this study also found that overweight females were malnourished, while obese females needed to be corrected [24].

In another study, diet quality was determined using the Healthy Eating Index-2005 (HEI-05) score. An interaction between diabetes status, gender and HEI-05 was found (P = 0.011) [25]. HEI score; metabolic syndrome [26], depression [27], and ovarian cancer [28], have been shown to be related to the levels of compounds such as glucose, amino acid and lipid [29]. In many studies, HEI has been adapted to countries' own nutritional recommendations [30,31].

Conclusion

In conclusion, if there is no a significant difference in the BMI between the groups between 25-30 and 30-40 according to the total HEI scores, the total dietary quality needs to be changed and improved in both groups.

Effective intervention efforts to raise awareness about the development of dietary quality and nutritional diversity in the community should be increased and sustained. Therefore, the development of dietary quality indices specific to the nutrient consumption and dietary habits of HEI in my country adaptable to my country and the use of HEI as a screening tool may be more effective in showing the factors affecting diet quality and diet quality.

References

1. Burriel FC, Urrea RS, Daouas T, et al. Food habits and nutritional assessment in a Tunisian University. Nutr Hosp. 2014; 30: 1350-1358.
2. http://www.healthcare.gov/center/councils/nphpphc/strategy/report.pdf
3. George L, Blackburn GL, Wang KA. Dietary fat reduction and breast cancer outcome results from the Womens Intervention Nutrition Study WINS. The American Journal of Clinical Nutrition. 2017; 1-4.
4. http://www.who.int/world-health-day/en/
5. Root MM, Houser SM, Anderson JJB, et al. Healthy Eating Index 2005 and selected macronutrients are correlated with improved lung function in humans. Nutrition Research. 2014; 34: 277-284.
6. Pick ME, Edwards M, Moreau D, et al. Assessment of Diet Quality in pregnant Women Using the Healthy Eating Index. Journal of the American Dietetic Association. 2005; 105: 240-246.
7. Almeida Ventura D, Matos Fonseca V, Ramos EG, et al. Association between quality of the diet and cardiometabolic risk factors in postmenopausal women. Nutritional Journal.

2014; 13: 121.
8. Tande DL, Magel R, Strand BN. Healthy Eating Index and Abdominal obesity. Public Health Nutrition. 2009; 13: 208-214.
9. Spronk I, Kullen C, Burdon CA, et al. Relationship between nutrition knowledge and dietary intake. British Journal of Nutrition. 2014; 111: 1713-1726.
10. Chard M. Investigating the Impact of 'other foods on Aboriginal Children's Dietary Intake Using the Health Eating Index-Canada HEI-C. Waterloo, University of Waterloo.
11. Guenther PM, Casavale KO, Kirkpatrick SI. et al. Update of the Healthy Eating Index HEI- 2010. Journal of the Academy of Nutrition and Dietetics. 2013; 113: 569-580.
12. www.who.int/dietphysicalactivity/en/ 2017.
13. Ridgwell J. Examining Food Nutrition. Edinburgh Heinemann. 2008.
14. https://www.cnpp.usda.gov/.../dietary_guideline
15. http://www.cnpp.usda.gov/Publications/USDAFoodPatterns/Nutrientsin2010USDAFoodPatternsatAllCalorieLevels.pdf
16. Reedy J, Krebs-Smith SMA, Hammond RA, et al. Advancing the Science of Dietary Patterns Reseach to Leverage a Complex Systems Approach. Journal of the Academy of Nutrition and Dietetics. 2017; 117: 7: 1019-1022.
17. Guenther PM, Reedy J, Krebs-Smith SM, et al. Evaluation of the Health Eating Index-2005. J Am Diet Assoc. 2008; 108: 1854-1864.
18. Shergill-Bonner R. Micronutrients. Paediatrics and Child Health. 2013; 23: 331-336.
19. http://www.nap.edu/catalog/11537.html
20. https://www.ncbi.nlm.nih.gov/books/NBK114310/
21. https://www.nap.edu/.../dietary-reference-intakes-for-energy
22. Nazif S. The Assessment of Nutritional Status and Calcium Intake of Women aged 19-40 living in the Turkish Republic of Northern Cyprus. Hacettepe University, Institute of Health Sciences, Nutritional Sciences Program, Master of Science Thesis, Ankara. 2012.
23. Garipağaoğlu M, Eliuz B, Esin K, et al. Tıp Fakültesi 1. sınıf öğrencilerinin Beslenme Durumlarının Değerlendirilmesi. İstanbul Tıp Dergisi-İstanbul Med J. 2012; 13: 1-8.
24. Britten P, Cleveland LE, Koegel KL, et al. Updated US Department of Agriculture Food Patterns meet goals of the 2010 Dietary Guidelines. J Acad Nutr Diet. 2010; 112: 1648-1655.
25. Exebio JC, Zarini, GG, Exebio C, et al. Healthy Eating Index scores associated with symptoms of depression in Cuban-Americans with and Without type 2 diabetes a cross sectional study. Nutr J. 2011; 10: 135.
26. Pan Y, Pratt CA. Metabolic syndrome and its association with diet and physical activity in US adolescents. J Am Diet Assoc. 2008; 108: 276-286.
27. Kuczmarski MF, Cremer Sees A, Hotchkiss L, et al. Higher Healthy Eating Index-2005 scores associated with reduced symptoms of depression in an urban population finding from the Health Aging in neighborhoods of Diversity Across The life Span Handls Study. J Am Diet Assoc. 110: 383-389.
28. Chandran U, Bandera EV, Williams-King MG, et al. Healthy eating index and ovarian cancer risk. Cancer Causes Control. 22: 563-571.
29. Weinstein SJ, Vogt TM, Gerrior SA. Healthy Eating Index scores are associated with blood nutrient concentrations in the third National Health and Nutrition Examination Survey. J Am Diet Assoc. 2004; 104: 576-584.
30. Dresher LS, Thiele S, Mensink GBM. A new index to measure healthy food diversity better reflects a health diet than traditional measures. J Nutr. 2007; 137: 647-651.
31. Fujita M, Lo YJ, Baranski JR. Dietary diversity score is a useful indicator of vitamin a status of adult women in Northern Kenya. Am J Hum Biol. 2012; 24: 829-834.