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Assessment of food consumption frequency and physical activity level in cancer patients: A pilot study

Kanser hastalarında besin tüketimi sıklığı ve fiziksel aktivite düzeyinin değerlendirilmesi: Pilot çalışma

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Abstract

Aim. The aim of the study was to evaluate the food consumption frequency and physical activity level in cancer patients treated in Hacettepe University Oncology Hospital, in Ankara/Turkey. **Methods.** We have randomly selected 60 (35 men, 25 women) cancer patients between the ages of 16-77 years. The study was carried out using a "face to face interview technique". The patients were assessed for their physical activity level, number of main meals and snacks consumed daily, amount of drinking water in a day and food consumption frequency. **Results.** The mean age of the patients included in the study was found 52.2±2.1 years. Body mass index (BMI) of patients ranged from 14.0- 43.3 kg/m^2 and mean BMI was found as 23.8±0.9 kg/m^2 for men and 26.7±1.3 kg/m^2 for women. The most common cancer type was found to be lung cancer among men and breast cancer among women related to the type of cancer diagnosis. According to the evaluation of meal skipping, it has been found that half of the patients do not skip meals, 40.0% always skip meals and 10.0% sometimes skip meals. It has been shown that decreased appetite was the most important cause of skipping meals. The frequency of consumption of meat products (salami, sausage, etc.) have decreased after the diagnosis in the patients. It has been observed a significant increase in the frequency of consumption of oilseeds (walnut, hazelnut) after diagnosis in the patients. When physical activity status of the patients was asked, 30.0% of them have been reported to walk daily or every other day or three times per week. The mean duration of daily walking was found 30.4±3.9 minutes. **Conclusion.** In this present study, it has been seen that both male and female patients have tried to give up improper eating habits after diagnosis. Healthy nutrition and regular physical activity are important for the improvement of the life quality of the cancer patients.

Keywords: Nutrition, physical activity, cancer, food consumption frequency

Özet

Amaç. Bu çalışmanın amacı, Ankara ili Hacettepe Üniversitesi Onkoloji Hastanesi'nde tedavi gören kanser hastalarının besin tüketim sıklığı ve fiziksel aktivite düzeyini değerlendirmektir. **Yöntem.** Yaşları 16-77 yıl arasında değişen, rastgele örnekleme yöntemiyle 60 (35 erkek, 25 kadın) kanser hastası seçilmiştir. Bu çalışma "yüz yüze görüşme tekniği" kullanılarak gerçekleştirildi. Hastalarda fiziksel aktivite düzeyi, günlük tüketilen ara ve ana öğün sayısı ve bir günlük besin tüketim sıklığı ve günlük tüketilen içme suyu miktarı değerlendirildi. **Bulgular.** Çalışmaya dahil edilen hastaların yaş ortalaması 52,2±2,1 yıldır. Hastaların vücut kitle indeksi (BKİ) 14,0-43,3 kg/m^2 arasında değişmektedir ve erkeklerde ortalama BKİ 23,8 ± 0,9 kg/m2, kadınlarda 26,7 ± 1,3 kg/m^2 olarak bulunmuştur. Tanısı konulan kanser türleri incelendiğinde, erkeklerde akciğer kanserinin, kadınlarda meme kanserinin en sık rastlanan kanser türleri olduğu tespit edilmiştir. Öğün atlama durumları değerlendirildiğinde, hastaların yarısı öğün atlamamakta; %40.0'ının her zaman ve % 10.0'unun bazen öğün atladığı tespit edilmiştir. İştah azalmasının öğün atlamada en önemli neden olduğu gösterilmiştir. Hastalarda et ürünlerinin (salam, sosis, vb.) tüketim sıklığı tanıdan sonra azalmıştır. Hastaların tanı sonrası yağlı tohumları (ceviz, fındık), tüketim sıklığında belirgin bir artış gözlenmiştir. Hastaların fiziksel aktivite durumu

sorgulandığında, bireylerin %30,0'unun her gün, günaşırı veya haftada üç kez yürüdüğü bildirilmiştir. Günlük yürüyüş süreleri ortalama 30,4 ± 3,9 dakika bulunmuştur. **Sonuç.** Bu çalışmada, hem erkek hem de kadın hastaların tanı sonrası yanlış beslenme alışkanlıklarından vazgeçmeye çalıştıkları görülmüştür Sağlıklı beslenme ve düzenli fiziksel aktivite kanser hastalarının yaşam kalitesinin iyileştirilmesi için önemlidir.

Anahtar sözcükler: Beslenme, fiziksel aktivite, kanser, besin tüketim sıklığı

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Introduction

Harmful dietary habits, inadequate physical activity, sedentary lifestyle, smoking, alcohol use, exposing to intense sunlight and stress are the primary factors causing cancer. The acquisition of lifelong healthy eating habits is crucial to prevent cancer [1].

Surgery, chemotherapy and radiotherapy can change nutrient requirements and can decrease nutrient intake, digestion, absorption, and availability of nutrients in the body. At least five servings of consumption of vegetables and fruits daily, restriction consumption of foods especially high in animal fat, increasing physical activity, having healthy body weight and limiting consumption of alcoholic beverages are recommended in Diet, Nutrition and Cancer Prevention Guidelines of American Cancer Society.

In general, cancer treatments cause fatigue and weakness in patients. Mild regular physical activity positively affects appetite during treatment. Moreover, it helps regulation of digestive system, prevention of constipation, protection of muscle mass and reduction of stress [2].

Body weight, fat and muscle tissue loss, and metabolic changes cause a complex syndrome is defined as "cachexia" in cancer patients. Anorexia, one of the most common cause of death, is seen 40-50% in the diagnosis and 50-70% during progression period of the disease. It is stated that more than 20% of oncology patients have died due to nutritional complications rather than the primary disease [3]. The main target for nutritional support to the cancer patients is to prevent cancer cachexia. The goals of nutrition therapy;

- To break the vicious cycle of anorexia and weight loss at an early stage,
- To make patients feel themselves strong and well,
- To provide patients' own care and sustain social relationships,
- To prevent and/or delay the degradation of the immune system functions,
- To provide good tolerance of anti-tumoral treatment in the patients [4].

In this present study, our aim was to evaluate the food consumption frequency and physical activity level in cancer patients.

Material and methods

The study was carried out using a "face to face interview technique". For our pilot study, a number of 60 (35 men, 25 women) cancer patients treated in Hacettepe University Oncology Hospital between the ages of 16-77 years. The sample was selected among patients (with different types of cancer) who agreed to participate voluntarily into the

study. The patients gave informed written consent which adhered to Declaration of Helsinki protocols (World Medical Association).

The questionnaire applied to the patients includes questions for general information and to determine nutritional status and physical activity level of the patients. These questions provided to learn gender, education level, marital status, economic status, occupation, family history about cancer, time after cancer diagnosis, cancer type, age (years), body weight (kg), height (cm), body mass index (kg/m^2), smoking habits, physical activity level, number of main meals and snacks consumed daily, amount of drinking water in a day and food consumption frequency.

All anthropometric measurements were taken by trained dieticians and with participants wearing light clothes and no shoes. A portable scale was used to measure body weight to the nearest half-kilogram. Height was measured to the nearest 0.1 cm with a wall-mounted stadiometer.

Statistical analysis

All statistical analyses were carried out with SPSS Version 15.0. For descriptive purposes continuous variables were summarized as median and standard deviation and categorical variables comprised proportions. The t-test was utilized to assess significance among categorical variables. Descriptive data were summarized as means with standard deviations or percentages, and differences between groups were tested using independent samples t-tests. Differences between the frequency of food consumption before diagnosis and after diagnosis were tested using paired t tests.

Results

The median value of the age of 60 patients included in the study has been found 55.5 years. Of the patients 58.3% (35 patients) were male and 41.7% (25 patients) were female. The 33.3% of all patients were primary school graduates. Differences between the gender and education, marriage, economic status of patients were not found statistically significant ($p>0.01$), whereas the differences between the gender and professions were found statistically significant ($p<0.01$). The 42.9% of male patients was retired, 31.4% was engaged in self-employment, and 84.0% of the female patients have been found to be a housewife. The families of 23.3% of patients have cancer. The elapsed time after cancer diagnosis has been found less than one year in the 53.3% of patients included in the study, 1-5 years in the 33.3%, and more than five years in the 11.7% of the patients. Table 1 shows the general characteristics of patients included in the study.

The body weight of the patients varied between 38.0 kg and 125.0 kg (median: 70.0 kg), body mass index (BMI) varied between 14.0 kg/m^2 and 43.3 kg/m^2. The median value of BMI was found 22.9 kg/m^2 in male patients and 27.1 kg/m^2 in female patients. While 88.0% of the female patients never smoke, this rate has been found decreased as 31.4% in the male patients. Mean duration of smoking has been found to be 26±2.9 years in men. The distribution of patients included in the study, related to the type of cancer diagnosis was given in Table 2.

The differences between gender distribution and having cancer type of the patients have been found to be statistically significant ($p<0.01$). The most common type of cancer was seen lung cancer (22.9%) among male patients and breast cancer (28.0%) among female patients. The most common types of other cancers were lymphoma and leukemia both men and women.

Table 3 indicates the mean values of time to exercise and walk in the patients included in the study.

Table 1. Distribution of general characteristics of patients (n: 60).

	$\bar{X} \pm SD$	Median	Min-Max
Age (year)			
Men	51.3± 6.8	55.0	16.0-73.0
Women	53.6±15.1	56.0	17.0-77.0
Total	52.2±16.0	55.5	16.0-77.0
Body Weight (kg)			
Men	69.6±17.0	70.0	39.5-125.0
Women	66.7±15.3	70.0	38.0-90.0
Total	68.4±16.3	70.0	38.0-125.0
Height (cm)			
Men	170.9±7.2	170.0	157-187
Women	158.3±5.1	159.0	145-170
Total	165.7±8.9	165.0	145-187
Body mass index (kg/m^2)			
Men	23.8±5.5	22.9	14.0-43.3
Women	26.7±6.6	27.1	14.3-42.8
Total	25.0±6.1	24.2	14.0-43.3
The year of smoking cessation			
Men	26.0±13.7	26.5	8.0-55.0
Women	20.0±8.7	15.0	15.0-30.0
Total	25.3±13.2	25.0	8.0-55.0
The number of cigarettes smoked / day			
Men	17.5 ± 10.6	17.5	10.0-25.0
Women	-	-	-
Total	17.5±10.6	17.5	10.0-25.0
Duration of smoking/year			
Men	40.5±20.5	40.5	26.0-55.0
Women	-	-	-
Total	40.5±20.5	40.5	26.0-55.0

Table 2. Distribution of patients related to the type of cancer diagnosis.

Cancer type	Men		Women		Total	
	n	%	n	%	n	%
Breast	-	-	7	28.0	7	11.7
Head-neck	3	8.6	-	-	3	5.0
Colon-rectum	2	5.7	1	4.0	3	5.0
Lung	8	22.9	-	-	8	13.3
Lymphoma	7	20.0	5	20.0	12	20.0
Cervical	-	-	1	4.0	1	1.7
Stomach	1	2.9	4	16.0	5	8.3
Esophagus	-	-	1	4.0	1	1.7
Liver	2	5.7	-	-	2	3.3
Pancreas	-	-	1	4.0	1	1.7
Skin	1	2.9	-	-	1	1.7
Leukemia	7	20.0	4	16.0	11	18.3
Bone	2	5.7	1	4.0	3	5.0
Testicular	2	5.7	-	-	2	3.3
Total	35	100.0	25	100.0	60	100.0

It has been found that only 8.3% of the patients have done physical-fitness exercises and aerobic. The 30.0% of patients have gone for a walk every day or every other day or three times a week. The mean duration of daily walking has been found 30.4±3.9 minutes ($p > 0.01$). The average values of the number of meals and the amount of water consumed daily by the patients is shown in Table 4.

Table 3. The mean values of exercise duration of the patients.

	$\bar{X}$ ± SD	Median	Min-Max
The duration of daily exercise * (minutes)			
Men	20.0±0.0	-	20.0-20.0
Women	16.3±4.8	17.5	10.0-20.0
Total	17.0±4.5	20.0	10.0-20.0
The duration of daily walking (minutes)			
Men	32.8±12.5	30.0	20.0-60.0
Women	26.0±18.2	20.0	10.0-50.0
Total	30.4±14.5	30.0	10.0-60.0
The duration of walking gone every other day (minutes)			
Men	30.0±0.0	-	30.0-30.0
Women	20.0±0.0	-	20.0-20.0
Total	25.0±7.1	25.0	20.0-30.0
The duration of walking gone three times per week (minutes)			
Men	25.0±7.1	25.0	20.0-30.0
Women	-	-	-
Total	25.0±7.1	25.0	20.0-30.0

It has been found that the number of main meals consumed was 2.6±0.6 and the number of snacks was 2.1±0.8. The differences between the gender and the number of meals consumed have not been found to be statistically significant, on the other hand the differences between the gender and the amount of water consumed by the patients have been found to be statistically significant ($t=2.539$, $p=0.014$; $p<0.05$). The mean amount of drinking water was 1497.0±927.2 mL/day in the male patients and 960.0±600.0 mL/day in the female patients.

Table 4. The mean values of the number of meals and the amount of daily water consumption.

	$\bar{X}$ ± SD	Median	Min-Max
The number of main meals			
Men	2.6±0.6	3.0	1.0-3.0
Women	2.6±0.6	3.0	1.0-3.0
Total	2.6±0.6	3.0	1.0-3.0
Snacks			
Men	2.1±0.9	2.0	1.0-3.0
Women	2.1±0.8	2.0	1.0-3.0
Total	2.1±0.8	2.0	1.0-3.0
The amount of water consumed per day (mL)			
Men	1497.0±927.2	1400.0	200.0-4000.0
Women	960.0±600.0	1000.0	200.0-2000.0
Total	1273.0±844.5	1000.0	200.0-4000.0

It has been found that half of the patients (50.0%) did not skip meals, but 40.0% of them skipped meals constantly and 10.0% of them sometimes skip meals. Breakfast was the most skipped meal. Lack of appetite (43.3% of the patients) was found to be the most important cause of skipping meals.

Approximately, half of the patients (40.0% of the male patients and 64.0% of the female patients) have other health problems diagnosed by the doctor in addition to cancer. It has been found that 30.0% of the patients have hypertension, 18.3% have diabetes mellitus, 10.0% have cardiovascular diseases and 8.3% have respiratory diseases. Moreover, the liver, gallbladder, kidney, bone-joint and thyroid gland diseases have been seen in the some patients. It has been applied chemotherapy for 40.0% of the male patients and 32.0% of the female patients up to the end of the study.

The consumption frequency of some basic foods according to gender of patients was evaluated (Table 5).

Table 5. Food Frequency status of the patients.

Food Groups		Everyday		Every other day		1-2 times per week		2 times a month		Rarely/none	
		n	%	n	%	n	%	n	%	n	%
Milk											
BD	Men	10	28.6	2	5.7	8	22.9	3	8.6	12	34.3
	Women	11	44.0	1	4.0	7	28.0	1	4.0	5	20.0
	Total	21	35.0	3	5.0	15	25.0	4	6.7	17	28.3
AD	Men	14	40.0	3	8.6	6	17.1	1	2.9	11	31.4
	Women	11	44.0	2	8.0	6	24.0	1	4	5	20
	Total	25	41.7	5	8.3	12	20.0	2	3.3	16	26.7
Yoghurt											
BD	Men	22	62.9	4	11.4	8	22.9	-	-	1	2.9
	Women	14	56.0	2	8.0	7	28.0	-	-	2	8.0
	Total	36	60.0	6	10	15	25.0	-	-	3	5.0
AD	Men	20	57.1	3	8.6	11	31.4	-	-	1	2.9
	Women	14	56.0	1	4.0	8	32.0	-	-	2	8.0
	Total	34	56.7	4	6.7	19	31.7	-	-	3	5.0
Cheese											
BD	Men	31	88.6	-	-	1	2.9	-	-	3	8.6
	Women	20	80.0	1	4.0	2	8.0	-	-	2	8.0
	Total	51	85.0	1	1.7	3	5.0	-	-	5	8.3
AD	Men	32	91.4	-	-	-	-	-	-	3	8.6
	Women	18	72.0	1	4.0	1	4.0	-	-	5	20.0
	Total	50	83.3	1	1.7	1	1.7	-	-	8	13.3
Beef											
BD	Men	6	17.1	6	17.1	7	20	1	2.9	15	42.8
	Women	5	20.0	3	12.0	6	24	3	12.0	8	32.0
	Total	11	18.3	9	15.0	13	21.7	4	6.7	23	38.3
AD	Men	3	8.6	2	5.7	13	37.1	1	2.9	16	45.7
	Women	6	24.0	2	8.0	8	32	3	12.0	6	24.0
	Total	9	15.0	4	6.7	21	35	4	6.7	22	36.7
Lamb meat											
BD	Men	5	14.3	4	11.4	1	2.9	1	2.9	24	68.6
	Women	1	4.0	3	12.0	2	8	-		19	76.0
	Total	6	10.0	7	11.7	3	5	1	1.7	43	71.7
AD	Men	1	2.9	3	8.6	2	5.7	3	8.6	26	74.3
	Women	-	-	-	-	4	16.0	2	8.0	19	64.0
	Total	1	1.7	3	5	6	10.0	5	8.3	45	75.0
Meat products (salami, sausage)											
BD	Men	3	8.6	-	-	11	31.4	-	-	21	60.0
	Women	4	16.0	1	4.0	7	28.0	1	4.0	12	48.0
	Total	7	11.7	1	1.7	18	30.0	1	1.7	33	55.0
AD	Men	1	2.9	1	2.9	8	22.9	1	2.9	24	68.6
	Women	1	4.0	-	-	5	20.0	3	12.0	16	64.0
	Total	2	3.3	1	1.7	13	21.7	4	6.7	40	66.7
Poultry											
BD	Men	6	17.1	4	11.4	12	34.3	5	14.3	8	22.9
	Women	-	-	3	12.0	18	72.0	2	8.0	2	8.0
	Total	6	10.0	7	11.7	30	50.0	7	11.7	10	16.7
AD	Men	4	11.4	8	22.9	10	28.6	3	8.6	10	28.6
	Women	1	4.0	1	4.0	19	76.0	2	8.0	2	8.0
	Total	5	8.3	9	15	29	42.3	5	8.3	12	20
Fish											
BD	Men	-	-	2	5.7	15	42.9	8	22.9	10	28.6
	Women	-	-	-	-	6	24.0	3	12.0	16	64.0
	Total	-	-	2	3.3	21	35.0	11	18.3	26	43.3
AD	Men	1	2.9	1	2.9	17	48.6	6	17.1	10	28.6
	Women	-	-	-	-	7	28.0	5	20.0	13	52.0
	Total	1	1.7	1	1.7	24	40.0	11	18.3	23	38.3
Legumes											
BD	Men	1	2.9	1	2.9	26	74.3	5	14.3	2	5.8
	Women	-	-	-	-	19	76.0	4	16.0	2	8.0
	Total	1	1.7	1	1.7	45	75.0	9	15.0	4	6.7
AD	Men	1	2.9	-	-	26	74.3	5	14.3	3	8.6
	Women	-	-	-	-	19	76.0	3	12.0	3	12.0
	Total	1	1.7	-	-	45	75.0	8	13.3	6	9.0
Nuts											
BD	Men	7	20.0	5	14.3	8	22.9	-	-	15	42.8
	Women	5	20.0	1	4.0	8	32.0	4	16.0	7	28.0
	Total	12	20.0	6	10	16	26.7	4	6.7	22	26.7
AD	Men	13	37.1	3	8.6	7	20.0	1	2.9	11	31.4
	Women	10	40.0	-	-	5	20.0	2	8.0	8	32.0
	Total	23	38.3	3	5.0	12	20.0	3	5.0	19	31.7

Vegetable											
BD	Men	32	91.4	-	-	2	5.7	-	-	1	2.9
	Women	23	92.0	-	-	2	8.0	-	-	-	-
	Total	55	91.7	-	-	4	6.7	-	-	1	1.7
AD	Men	32	91.4	-	-	2	5.7	-	-	1	2.9
	Women	23	92.0	1	4.0	1	4.0	-	-		
	Total	55	91.7	1	1.7	3	5.0	-	-	1	1.7
Fruit											
BD	Men	23	65.7	-	-	7	20.0	-	-	5	14.3
	Women	20	80.0	-	-	4	16.0	-	-	1	4.0
	Total	43	71.7	-	-	11	18.3	-	-	6	10
AD	Men	26	74.3	1	2.9	4	11.4	-	-	4	11.4
	Women	21	84.0	-	-	2	8.0	-	-	2	8.0
	Total	47	78.3	1	1.7	6	10.0	-	-	6	10
Bread											
BD	Men	33	94.3	-	-	-	-	-	-	2	5.7
	Women	24	96.0	-	-	-	-	-	-	1	4.0
	Total	57	95.0	-	-	-	-	-	-	3	5.0
AD	Men	31	88.6	-	-	-	-	-	-	4	11.4
	Women	22	88.0	-	-	-	-	-	-	3	12.0
	Total	53	88.3	-	-	-	-	-	-	7	11.7
Oliveoil, hazelnut oil											
BD	Men	14	40.0	1	2.9	5	14.3	-	-	15	42.9
	Women	7	28.0			7	28.0	-	-	11	44.0
	Total	21	35.0	1	1.7	12	20.0	-	-	26	43.3
AD	Men	15	42.9	1	2.9	5	14.3	-	-	14	40.0
	Women	13	52.0			4	16.0	-	-	8	32.0
	Total	28	46.7	1	1.7	9	15.0	-	-	22	36.7
Cornoil, sunflower, soybean oil											
BD	Men	24	68.6	1	2.9	1	2.9	-	-	9	25.8
	Women	20	80.0	-	-	-	-	1	4	4	16.0
	Total	44	73.3	1	1.7	1	1.7	1	1.7	13	21.7
AD	Men	27	77.1	2	5.7	-	-	-	-	6	17.2
	Women	23	92.0	-	-	1	4.0	-	-	1	4.0
	Total	50	83.3	2	3.3	1	1.7	-	-	7	11.7
Margarine											
BD	Men	6	17.1	2	5.7	2	5.7	-	-	25	71.5
	Women	4	16.0	-	-	1	4.0	1	4	19	76.0
	Total	10	16.7	2	3.3	3	5.0	1	1.7	44	73.3
AD	Men	3	8.6	1	2.9	2	5.7	-	-	29	82.9
	Women	1	4.0	-	-	-	-	1	4.0	23	88.0
	Total	4	6.7	1	1.7	2	3.3	1	1.7	52	86.6
Butter											
BD	Men	18	51.4	1	2.9	4	11.4	1	2.9	11	31.5
	Women	14	56.0	-	-	4	16.0	-	-	7	28.0
	Total	32	53.3	1	1.7	8	13.3	1	1.7	18	30.0
AD	Men	15	42.9	1	2.9	5	14.3	1	2.9	13	37.1
	Women	11	44.0	-	-	4	16.0	-	-	10	40.0
	Total	26	43.3	1	1.7	9	15.0	1	1.7	23	38.3
Sugar, honey, jam											
BD	Men	25	71.4	1	2.9	7	20.0	-	-	2	5.7
	Women	22	88.0	1	4.0	2	8.0	-	-		
	Total	47	78.3	2	3.3	9	15.0	-	-	2	3.3
AD	Men	26	74.3	-	-	7	20.0	-	-	2	5.7
	Women	20	80.0	1	4.0	3	12.0	-	-	1	4.0
	Total	46	76.7	1	1.7	10	16.7	-	-	3	5.0

AD: After diagnose, **BD:** Before diagnose

The differences of the consumption frequency of some foods (lamb, meat products, oil seeds, vegetable oils, margarine, butter, grease) between before and after the diagnosis have been found to be statistically significant ($p<0.05$). Lamb meat was rarely consumed by the 71.7% of patients before diagnosis and 75.0% of patients after diagnosis. It has been found that meat products (salami, sausage, etc.) were consumed every day by the 11.7% of patients before diagnosis and 3.3% of patients after diagnosis. The frequency of fish consumption was found as at least one time per week in the 48.6% of male patients and 24.0% of female patients before diagnosis. After diagnosis this rate was 54.4% in male patients and 28.0% in female patients. Moreover, it was seen a significant increase the consumption frequency of oil seeds (such as walnut and hazelnut) after the diagnosis in patients. Both before and after diagnosis 91.7% of the patients stated that they

consumed vegetables daily. Before diagnosis 71.7% of them consumed fruits daily. This rate rose to 78.3% after diagnosis. While the frequency consumption of olive oil, sunflower oil, and corn oil increased after diagnosis, the consumption frequency of solid margarine, butter and grease decreased. It has been found that 20.0% of the female patients consumed molasses daily before diagnosis. This rate has been found to be 44.0% of the female patients after diagnosis. The consumption frequency of processed foods has decreased in both male and female patients after diagnosis. While 11.5% of male patients and 32.0% of female patients consumed processed foods at least one time per week before diagnosis, these rates has been found to be 8.6% in male patients and 16.0% in female patients after diagnosis. It has been found that 88.3% of the patients did not consume diet products, on the other hand 11.7% of them consumed "low-fat milk and/or low-fat cheese" as a diet product. The 26.7% of patients have stated that they had a habit of spreading salt in food without tasting.

Discussion

Adequate and balanced nutrition, maintaining proper weight for height, doing regular physical activity, not smoking and avoiding smoking environments play an important role in preventing cancer [5, 6]. Inadequate consumption of vegetables, fruits, whole grains and legumes, preference of refined cereals instead of whole grains, having fiber-poor diet, excessive dietary total fat consumption, preference of solid fats instead of oils, cooking foods using with incorrect methods (frying, barbecue, etc.) cause taking the carcinogenic substances into the body. Moreover, excess salt intake, high consumption of foods containing food additives and excess alcohol consumption take place among improper dietary habits [1]. It has been reported that mortality rate is significantly lower in women with breast cancer who consume high levels of fruits, vegetables, whole-grain products and low-fat dairy products than healthy women who consume high levels of red meat, refined cereals, full fat dairy products and sweets [7]. High-fat, high-energy diets are important in the development of obesity. This case is associated with an increase in cancer incidence, repetition rate of the disease and shortened life expectancy [8]. In this present study, it has been seen that both male and female patients have tried to give up improper eating habits after diagnosis. It is important that the consumption of lamb, meat products (salami, sausage, etc.), fats and processed foods has decreased significantly in the study patients. Bosetti et al. [9] studied the relationship between the Mediterranean diet and cancer risk. They reported that olive oil-rich in monounsaturated fatty acids has a positive effect on breast, ovarian, colorectal, and mostly upper digestive tract cancers. It has been emphasized that whole-grain foods and omega-3 fatty acids also reduce the risk of occurrence of various cancers. In our study, compared with before diagnosis, the consumption frequency of olive oil, hazelnut oil rich in monounsaturated fatty acids and fish rich in omega-3 fatty acids have increased after diagnosis. It has been noted that refined grains, high glycemic index /glycemic load and frequent consumption of red meat are associated with increased cancer risk. Fruits and vegetables protect against cancer and affect health positively in cancer patients because of including various phytochemicals, antioxidants and fiber in high amounts [7]. In several studies, it has been reported that vegetables and fruits can reduce the risk of cancer and cardiovascular disease, and this effect is due to abundant antioxidants content of fruits and vegetables. Antioxidants reduce and/or eliminate the formation of reactive oxygen and nitrogen species which cause cellular dysfunction damaging cells. Antioxidants repair oxidative damage in biological molecules [10, 11]. In the EPIC (fruits and vegetables consumption and the risk of histological subtypes of lung cancer in the European Prospective Investigation into Cancer and Nutrition) study, it has been stated that 100 g of an increase in vegetable and fruit consumption can provide a reduction of 6% in risk of lung cancer [12].

In this present study, 91.7% of the patients have consumed vegetables daily both before and after diagnosis. The 71.7% of patients consumed fruits daily before diagnosis. This rate has increased to 78.3% after diagnosis. Colon cancer is seen more common in the

societies whose total fat intake is high. Average fat intake constitutes 40-50% of the total energy in Western countries where the colorectal cancer rate is high whereas average fat intake constitutes only 10-15% of the total energy in low risk groups. It has been found that increased red meat consumption is significantly associated with increased colon cancer incidence. An inverse relationship has been found between the risk of colorectal cancer and physical activity status. The development of obesity also increases the risk of colorectal cancer [13]. In our study, 5.0% of the patients have had colorectal cancer (5.7% of the male patients and 4.0% of the female patients). It was found that daily consumption of red meat (lamb), processed meat (salami, sausage, etc.) and butter were higher before diagnosis in both genders.

In this present study, it has been found that half of the patients (50.0%) always or sometimes skip meals. Significant increase has been observed in the consumption frequency of oilseeds (walnut, hazelnut) in the patients. 75.0% of the patients have rarely consumed lamb. The consumption frequency of meat products have also decreased after diagnosis. While the consumption frequency of oils like olive oil, hazelnut oil, corn oil, and sunflower oil has been found to increase, the consumption frequency of margarine and butter has been found to decrease after diagnosis. In a study conducted in Spain, it has been found that the consumption of red meat and processed meat products instead of legumes as a source of protein increase significantly. Also, it is reported that males have higher levels of risk than women. Men have exposed to more risk factors related to lifestyle (diet, smoking, excessive alcohol consumption, sedentary lifestyle, obesity and diabetes) [14]. Larson [15] reported that diets including low-fat and high fiber may be protective against colorectal cancers. Fiber provides moving rapidly of waste from the digestive system and increasing the fecal mass. Therefore, harmful waste do not contact with the bowel lumen long time. In this present study, it has been reported that 75.0% of the patients have consumed legumes 1 or 2 times per week and 91.7% of them has consumed vegetables every day both before and after diagnosis. It has been reported that obesity seen after menopause is the important risk factor for breast cancer [16]. In our study, it has been found that 28.0% of the female patients have breast cancer. Obesity and sedentary life may have significant potential impact in the presence of the disease in these patients. Jones et al. [7] investigated the effect of exercise on the progression of breast and colon cancer and survival. It has been found that regular physical activity (compared with sedentary lifestyle) affects significantly decreasing the rate of disease progression and mortality risk. According to results of studies, it is supported that exercise is safe and well tolerated. At least 30 minutes moderate physical activity is recommended for five days per week. Regular physical activity has an important role in prevention and treatment of colorectal cancers. Cross-sectional studies have shown that doing regular physical activity (7 hours brisk walking per week) reduces the risk of colon cancer. Moreover, it has been noted that physical activity (4 hours brisk walking per week) provides beneficial effects in patients diagnosed colorectal cancer [17]. The relationship between physical activity intensity, duration and postmenopausal breast cancer risk has been investigated by Peters et al. [18]. Postmenopausal breast cancer risk has been found 16% less in individuals who have done moderate or severe physical activities more than seven hours per week for 10 years than inactive individuals. In recent studies, it has been found that relapse rate of breast cancer and deaths due to disease have decreased significantly in breast cancer patients who are physically active compared with sedentary patients [8]. Bellizzi et al. [19] investigated the effect of physical activity on quality of life in adults with Non-Hodgkin's Lymphoma. Health-related quality of life (HRQOL) scores have shown a significant increase in Non-Hodgkin's Lymphoma patients who have done physical activities even low levels compared with sedentary adults. Cancer takes an important role among known cause of death in the United States. Smoking, high fat and refined sugar consumption and the absence of physical activity are shown as major risk factors for cancer development. It has been noted that diet rich in fat and simple sugars and the lack of physical activities are key factors in stimulating the formation of cancer

by inducing insulin resistance and hyperinsulinemia [20]. In one prospective cohort study, It has been concluded that increased consumption of fruits and vegetables can reduce the risk of lung cancer, dietary changes along with physical activity can provide positive effects on lung, stomach, and liver cancers [21]. In this present study it has been found that 30.0% of the patients doing brisk walking regularly (every day, every other day or three times per week). The average duration was found to be 30.4±3.9 minutes. Only 8.3% of the patients have been found to do aerobic and physical-fitness exercise regularly. It has been emphasized that having healthy body weight, doing regular physical activity (at least 30 minutes a day and five days per week), having healthy diet which are rich in vegetables, fruits and whole grains and including low saturated fat and red meat with moderate alcohol intake play an important role in reducing the risk of cancer formation and improving results after cancer [22].As a result of this study, it has been seen that both male and female patients have tried to give up improper eating habits after cancer diagnosis. It is important that the consumption of lamb, meat products (salami, sausage, etc.), fats and processed foods have decreased significantly during the therapy period. The nature of a pilot study imposes numerous limitations, first of which is the small sample size and limited geographic region from which the participants were recruited. Therefore, we were looking forward to repeat of this study with a larger sample size and more diverse geographic regions is needed.

The cancer patients should be encouraged to consume various healthy foods and have adequate and balanced diet. Maintaining healthy body weight, consuming vegetables and fruits at least five servings per day, preference of foods high in fiber such as legume, whole grain bread, reduction of sugar consumption and regular physical activity should be targeted. Aerobic exercises like walking, swimming, cycling are recommended at least 30 minutes a day and at least 3-4 days a week. It should not be forgotten that healthy nutrition and exercise are important part of the healthy and quality of life.

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