RESEARCH ARTICLE

Lifestyle Behaviors and Early Diagnosis Practices of Cancer Patients

Medine Yilmaz[1]*, Deniz Sanli[1], Mujde Ucgun[2], Nur Sahin Kaya[2], Yasemin Tokem[1]

Abstract

   <u>Background</u>: The aim was to determine the lifestyle behaviors and the practices for early diagnosis of cancer of cancer patients. <u>Materials and Methods</u>: A descriptive cross-sectional design was used for this study. The sample consisted of 222 patients with a diagnosis of cancer (non-random sample method). Ethical permission was obtained of the Non-interventional Research Ethics Committee of our Institution. Values of p<0.05 were accepted as statistically significant. <u>Results:</u> It was observed that 54.4% of the patients had never performed breast self-examination, 60.8% had never had a mammography, and 71.2% had never had a Pap smear. Sixty-six point two percent of patients had never had screening for colon cancer within the past ten years. GIS cancers were higher in smokers and ex-smokers (p=0.005), in drinkers and in ex-drinkers (p=0.000). The breast cancer rate was higher in obese people (p=0.019). <u>Conclusions:</u> The results of this study provide information on the healthy lifestyle behavior of cancer patients before their diagnosis, and their use of early diagnosis practices. The important aspect of this study is to extend cancer patients' period of life after the diagnosis and treatment process, to make them conscious of risky lifestyle and nutritional behavior so that they can maintain a high quality of life, and to start initiatives in this direction that would ensure changes in behavior.

Keywords: Cancer - lifestyle behaviour - screening - nutrition - Turkey

Introduction

   Every year, 12.7 million persons in the world are newly diagnosed with cancer. If preventive measures are not taken, it is estimated that the cancer burden of the world in general will increase and there will be 24 million newly diagnosed cancer cases in 2030, and deaths from cancer will reach 17 million. It is predicted that the most rapid increase in cancer will be in the low and middle income countries, of which Turkey is one (Tuncer, 2009).

   The frequency of occurrence of all types of cancer shows major differences according to socioeconomic status, geographical region, country and even continent. It is clear that these differences can develop for reasons such as hereditary factors as well as the use of cigarettes and alcohol, environmental pollution, types of profession, medicines, genetic predisposition and nutritional behavior. Despite these, the probability that 30-40% of cancers can be prevented is encouraging. Research shows that 85% of all cancers are related to lifestyle and stem from controllable individual behavior (Barclay, 1987). The basic risk factors are cigarette smoking, alcohol consumption, a sedentary life, obesity, excessive consumption of red meat and consumption of salty and smoked foods (Yildiz, 2008; Parsa and Parsa, 2009; Tuncer, 2009; Chan and

Giovannucci, 2010; De Stefani et al., 2012; Fu et al., 2012). In addition, not implementing and/or ignoring cancer screening practices for early diagnosis is another important factor (Ozmen, 2008; Bi Suh et al., 2012; Gulten et al., 2012; Yoo et al., 2012). It has been stated that besides avoiding these risk factors, adopting healthy lifestyle behavior, such as healthy nutrition and regular physical activity, can decrease cancer to a significant extent (Newton and Galvao, 2008; Fu et al., 2012). It is of great importance that the risk factors and early diagnosis symptoms be known by nurses in order to teach individuals at risk, so as to prevent cancer and ensure a healthy lifestyle with early treatment.

   The aim was to determine the lifestyle behaviors and the practices for early diagnosis of cancer of patients with cancer before diagnosis. It is thought that the findings of this study can be a guide in the planning of education given to healthy individuals and for the training/initiatives that would be organized for lifestyle behaviors of cancer patients after cancer treatment.

Materials and Methods

   A descriptive cross-sectional design was used for this study. The study was carried out between July and

[1]Health Sciences Faculty, [2]Ataturk Education and Training Hospital, Izmir Katip Celebi University, Izmir, Turkey   *For correspondence: medine1974@hotmail.com

November 2012 in the General Surgery clinics (General Surgery Clinics 1, 2, 3, and 4) at a university education and training hospital. The sampling consisted of 222 patients selected by the non-random sample method from patients hospitalized in the surgery clinic with a diagnosis of cancer, in the preoperative or postoperative period. Individuals were included in the study who were hospitalized in the general surgery clinics between the designated dates, had a new diagnosis of cancer, a previous diagnosis and had undergone an operation or would undergo an operation or symptomatic/supportive treatment, and who were 18 years of age and older, did not have a speaking or hearing problem and accepted to participate. Nine patients who were hospitalized in the general surgery clinics during the dates the study was carried out did not want to participate in the study, the general condition of five patients was poor, and 42 patients were in the early postoperative period and had been discharged from the hospital by the next data collection date.

Data collection

A Lifestyle Behaviors and Early Diagnosis Practices Form, which was prepared based on the literature (Norat et al., 2005; Arafa et al., 2011; Harmy et al., 2011; Pronk et al., 2011; Banque et al., 2012) was used as a data collection tool in the study. The form included questions on the patients' sociodemographic characteristics (14 questions), diagnosis and symptoms (5 questions), early diagnosis practices (10 questions) and food consumption (21 questions). The data was collected by the researchers three days of the week by face-to-face interview in the patients' rooms. The length of the interview with each patient was approximately 20 minutes.

Ethical consideration

The permission of the Izmir Katip Celebi University Non-interventional Research Ethics Committee (Decision No. 25) and the permission of the institution where the study was conducted were obtained in order to carry out the study. An explanation of the study was given to the patients and written approval was obtained. The patients' questions were answered and information was given on related subjects at the end of the data collection.

Data analysis and evaluation

Statistical analyses were performed with the program SPSS 17.0. Number, percentage distribution and average were used in the analysis of data, and the Pearson Chi-square was implemented in the comparisons of data. Values of $p<0.05$ were accepted as statistically significant. For the statistical analysis, a Body Mass Index (BMI) of ≤ 24.9 kg/m² was evaluated as normal and ≥ 25 kg/m² as obese. The frequency of consumption of different types of food prior to the diagnosis of cancer were asked in the form of "every day, 3-4 times a week, 1-2 times a week, 1-2 times a month, rarely, and never". The cancer types were grouped for the purposes of statistical analysis as breast cancer, gastrointestinal system (GIS) cancers (stomach, colon, rectum, pancreas), and other cancers (thyroid, ovarian, etc.).

Results

The socio-demographic characteristics of patients are given in Table 1. Figure 1 shows that the most frequently observed cancer types were colon (28.4%) and breast (19.4%). On average, cancer had been diagnosed 5.2±11.7 months before the study. The most frequently observed complaints and symptoms were loss of weight (48.6%), stomach ache (45.0%), loss of appetite (45.0%), constipation (32.0%), and nausea (28.4%). It was determined that 24.3% of patients had cancer in the family, and of these, 70.4% had a cancer diagnosis in one relative and 29.6% had a cancer diagnosis in two relatives, with the most frequent diagnosis in a sibling (n: 23), father (n: 18), and mother (n: 16).

Of the female patients, it was observed that 54.4% had never carried out examinations of their own breasts, 60.8% had never had a mammography taken, and 71.2% had never had a Pap smear. Of the male patients, it was determined that 77.9% had never had their Prostate-Specific Antigen (PSA) checked. It was observed that 66.2% of all the patients had never had screening for colon cancer within the past 10 years (Table 2).
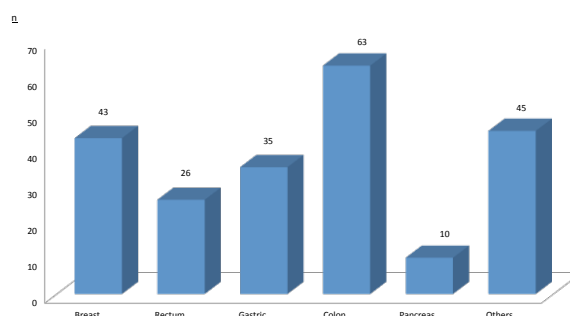
The food consumption frequencies of the patients are

Figure 1. Distribution of Cancer Diagnosis of Patients

Table 1. Distribution of Socio-demographic Characteristics of Cancer Patients

Characteristics		No.	%
Mean Age±SD		59.38±12.5	
Gender	Female	125	56.3
	Male	97	43.7
Education	Not literate	35	15.8
	Primary school	166	74.8
	High school - university	21	9.5
Occupation	Worker	21	9.5
	Housewife	80	36.0
	Unemployed/ retired	36	16.2
	Self-employed /farmer	85	38.3
Working conditions	Active	102	45.9
	Sedentary	120	54.1
Income	<expenses	121	54.5
	=expenses	91	41.0
	>expenses	10	4.5
Place lived the most in life	Village	54	24.3
	Small town	32	14.4
	City	30	13.5
	Metropolitan area	106	47.7
Total		222	100

given in Table 3. 32.4% of the patients consumed red meat once or twice a week, and the largest proportion, 37.4% consumed red meat once or twice a month. Chicken was consumed by 47.7% once or twice a week and by 25.7% once or twice a month. 29.3% of the patients consumed fish once or twice a month, and 27.9% consumed it once or twice a week in winter. Pickles were consumed once or twice a month by the largest group, while 27.9% consumed them rarely. Similarly, while grilled foods were consumed once a month by 28.8% of the patients, they were consumed very rarely by 42.3% of the patients.

The patients consumed margarine rarely (20.3%) or never (51.4%). 68.5% of the patients consumed olive oil and 26.1% sunflower oil every day. 68.0% of the patients consumed fruit and 65.8% vegetables every day, hot spices were consumed every day by 26.6% of the patients, 3-4 times a week by 14.0% and 1-2 times a week by 17.6%. The proportion of patients who consumed grain products, led by refined bread and rice, every day was 44.6%, and 29.7% consumed them once or twice a week. Legumes were consumed once or twice a week by the largest proportion (43.2%), and once or twice a month by 30.6%. The largest proportion of the patients (30.6%) consumed coffee and tea (86.0%) every day. 65.3% of the patients never consumed sausage or and 36.1% never consumed spiced sausage like pepperoni.

The relationships between various socio-demographic characteristics and the diagnosis of cancer

It was determined that there was no difference in the diagnoses of cancer according to age groups (χ^2: 1.1, p=0.59). Breast cancer and other cancer types were more frequent in females and GIS cancers were more frequent in males (χ^2: 59.9, p=0.000). Breast and other cancers were more frequent in housewives, whereas GIS cancers were more frequent in retired and self-employed patients (χ^2: 24, p=0.00). GIS cancers were more frequent in those who smoked cigarettes and those who had stopped smoking than in those who had never smoked (χ^2: 14.8, p=0.00). Similarly, in patients who had previously consumed alcohol or were still using it, and not breast and other cancer types and other cancers were more frequent than breast and other cancers (χ^2=26, p=0.00). The distribution of cancer diagnoses by BMI observed that breast cancer was more frequent in those who were obese (χ^2: 26, p=0.00). 59.8% of the females were obese and up and 9% of those who were obese were female (χ^2: 6.9, p=0.031). It was observed that there was no statistically significant between the distribution of cancer diagnoses and age, income,

Table 2. Distribution of Healthy Life-Style Behavior and Practices of Early Diagnosis of Cancer Patients

Characteristics		No.	%
Smoking status	Non-smoker	117	52.7
	Smoker	29	13.1
	Ex-smoker	76	34.2
Alcohol drinking	Never drink	159	71.6
	Drink	38	17.1
	Ex-drinker	25	11.3
BMI (n:218)	<24.9	102	46.8
	≥25	116	53.2
Exercise Status	No exercise	185	83.3
	Sometimes	27	12.2
	Regular	10	4.5
Breast Self-Examination (n: 125)	Regular	26	20.8
	Sometimes	31	24.8
	Never done	68	54.4
Mammography (n:125)	Regular	15	12.0
	When necessary	34	27.2
	Never	76	60.8
Pap-smear screening (n:125)	Regular	-	-
	When necessary	36	28.8
	Never	89	71.2
PSA screening (n: 97)	Regular	5	5.3
	When necessary	17	16.8
	Never	75	77.9
Colon Cancer Screening in last 10 Years (n:222)	Regular	-	-
	Once for diagnosis	75	33.8
	Never	147	66.2

Table 3. Distribution of Food Consumption Frequency of Individuals

	Every day		3-4 times in a week		1-2 times in a week		1-2 in a month		Rarely		Never	
	n	%	n	%	n	%	n	%	n	%	n	%
Foods: Meat	23	10.4	18	8.1	72	32.4	83	37.4	26	11.8	-	
Chicken	9	4.1	29	13.1	106	47.7	57	25.7	11	5.0	5	2.3
Fish	4	1.8	7	3.2	62	27.9	65	29.3	27	12.2	57	25.7
Milk	44	19.8	22	9.9	31	14.0	39	17.6	33	14.9	53	23.9
Cheese	178	80.2	4	1.8	5	2.3	3	1.4	1	0.5	31	14.0
Yoghurt	132	59.5	20	9.0	15	6.8	7	3.2	3	1.4	45	20.3
Pickles	22	9.9	21	9.5	38	17.1	61	27.5	62	27.9	18	8.2
Grill	3	1.4	8	3.6	26	11.7	64	28.8	94	42.3	27	12.2
Margarine	18	8.1	3	1.4	19	8.6	23	10.4	45	20.3	114	51.4
Olive oil	152	68.5	26	11.7	17	7.7	5	2.3	9	4.1	13	5.9
Sunfloweroil	58	26.1	19	8.6	16	7.2	34	15.3	21	25.0	74	33.4
Butter	43	19.4	20	9.0	36	16.2	38	17.1	47	21.2	38	17.2
Fruit	151	68.0	33	14.9	23	10.4	6	2.7	6	2.7	3	1.4
Vegetables	146	65.8	35	15.8	32	14.4	6	2.7	2	0.9	1	0.5
Hot spices	59	26.6	31	14.0	39	17.6	37	16.7	44	19.8	12	5.4
Grains	99	44.6	28	12.6	66	29.7	22	9.9	6	2.7	1	0.5
Legumes	1	0.5	15	6.8	96	43.2	68	30.6	7	3.2	35	15.8
Coffee	68	30.6	12	5.4	25	11.3	31	14.0	47	21.2	39	17.6
Black tea	191	86.0	9	4.1	7	3.2	3	1.4	6	2.7	6	2.8
Sausage-salami	3	1.4	5	2.3	8	3.6	20	9.0	41	18.5	145	65.3

Table 4. Cancer Diagnosis Distribution According to Sociodemographic Characteristics and Practices of Early Diagnosis of Cancer Patients

Characteristic		Breast Cancer n	%	GIS Cancer n	%	Other Cancer n	%	Total χ^2	p
Age group	<50	7	16.3	25	18.7	11	24.4	1.1	0.59
	≥ 50	36	83.7	109	81.3	4	75.6		
Gender	Female	43	100	49	36.6	33	73.3	59.9	0.000
	Male	0	0	85	63.4	12	26.7		
Occupation									
	Housewife	28	65.1	33	24.6	19	42.2		
	Retired	4	9.3	25	18.7	7	15.6	24.5	0.000
	Worker	3	7.0	14	10.4	4	8.9		
	Farmer	8	18.6	62	46.3	15	33.3		
BMI (n:218)									
	<24.9 m²	11	26.2	72	54.5	19	43.2	10.6	0.005
	≥25 m²	31	73.8	60	45.5	25	56.8		
Smoking	Never	32	74.4	59	44.0	26	57.8		
	Smoker	5	11.6	21	15.7	3	6.7	14.8	0.005
	Ex-smoker	6	14.0	54	40.3	16	35.6		
Alcohol drinking									
	Never	38	88.4	79	59.0	42	93.3		
	Ex-drinker	2	4.7	22	16.4	1	2.2	26.9	0.000
	Drinker	3	7.0	33	24.6	2	4.4		
Exercise status									
	Never	34	79.1	116	86.6	35	77.8		
	Sometimes	8	18.6	11	8.2	8	17.8	5.3	0.24
	Regular	1	2.3	7	5.2	2	4.4		
Colon Cancer Screening in last 10 years									
	No	41	95.3	101	75.4	40	88.9	10.6	0.005
	Yes	2	4.7	33	24.6	5	11.1		
Total		43	100	134	100	45	100	222	100

education, place lived the most in life and exercising status (Table 4).

Discussion

Various studies (Norat et al., 2005; Arafa et al., 2011; Sezer et al., 2011; Banque et al., 2012; Fu et al., 2012) have shown that insufficient physical activity, obesity, sedentary lifestyle, smoking cigarettes and drinking alcohol, a diet inadequate in vegetables and fruits, animal-sourced fats and meat consumption, the consumption in the diet of pickled products and processed meat products, and not carrying out early screening generate risks for various cancers. The results of this study provide information on the healthy lifestyle behavior of cancer patients before their diagnosis, and their use of early diagnosis techniques.

In this study, the most frequently observed cancer types in the patients were colorectal, breast and stomach cancers, in that order this result is in conformance with Turkish cancer statistics for 2006 (Eser et al., 2010). It was determined in this study that breast cancer was more frequent in women and GIS cancer was more frequent in males (p<0.05). The cancer types observed most frequently according to gender were found to be similar to the results of other studies in Turkey (Karaca et al., 2011; Gursu et al., 2012). A great majority of the patients in the study group had spent a significant portion of their lives in a metropolitan area and especially in the city where the study was made, but whether because of their socioeconomic status or because they had brought their culture and lifestyle with them from the place where they

originated, their cancer types reflected Turkey in general, and in fact data for America and Turkey are similar in this respect (Macdonald et al., 2006; Sezer et al., 2011).

It has been reported that the relationship between fat in the diet and breast cancer is clearer in women in the postmenopausal period (Sczaniecka et al., 2012). Of the patients participating in the study, more than half were obese; a great majority of those who were obese were women and there was a higher frequency of breast cancer in those who were obese (p<0.05). This study finding supports the view that the frequency of breast cancer in obese women is higher. It has been shown in a number of studies that engaging in physical activity/exercises decreases the risk of cancer and avoiding which is effective in promoting health and preventing obesity (Pronk et al., 2011; Turkish Statistical Institute, 2010), as observed that the proportion of those doing exercise was very low. A study done on lifestyle indicators for colorectal cancer supported this study finding (Slattery and Orenstein, 2002). In addition, it is known that sedentary life is related to breast cancer (Adebamowo, 2010), and over half of the patients in the study group stated that their form of work in their lives present was sedentary. When all of these factors are taken into account, it is observed that even if early diagnosis and screening programs become widespread, breast and GIS cancers will still be a serious health problem in Turkey.

It is known that smoking cigarettes is a risk factor for cancer (Jemal et al., 2011; Sezer et al., 2011; Fu et al., 2012). According to the Adult Tobacco Research of Turkey (ATRT) (Turkish Statistical Institute, 2012) in 2010 the present ratio of cigarette smoking is 27.1%, and it was 13.3% in this study. Our results were lower than those of ATRT. The knowledge that more than 80% of the adult smokers started to smoke cigarettes before 18 years of age indicates that the age when the patients started to smoke in this study is rather young. The fact that half of the patients had never smoked cigarettes and despite the fact that approximately half of them had a chronic disease, the frequency of the GIS cancers was higher in those who still smoked cigarettes and those who had previously smoked compared to those who had never smoked shows the effect of cigarettes on the incidence of cancer in these individuals (p=0.005). Similarly, other studies on the proportion of alcohol use (Larsen et al., 2006; Jemal et al., 2011) showed a similarity with at the ratios of 10.9% and 15.1%. It has been reported that GIS cancers are more frequent in patients who drink occasionally and in those who currently drink (p<0.05).

Scanning activities such as mammography, Pap smear tests and colonoscopy are performed at early screening centers in Turkey (Tuncer, 2009). It has been determined that the frequency of breast self-examination is low in Turkey (Gocgeldi et al., 2008; Ozmen, 2008; Gultekin et al., 2011). In this study, it was observed that less than half of the female patients had performed breast self-examination. This result was very low compared to other studies in the world (Al-Naggar et al., 2012; Bi Suh et al., 2012; Maheu et al., 2012; Soares et al., 2012; Yoo et al., 2012). There are sociocultural, educational and economic barriers to breast cancer detection that need to be

overcome among women in Turkey (Ozmen, 2008). The proportion of those who had had a mammography or a Pap smear was also very low. In other studies, it is stated that the proportions of those who have had a mammography varies between 13% and 49.1% in Turkey (Ozaydın et al., 2009; Rizalar and Altay, 2010; Gulten et al., 2012). However, it was determined in other Turkish studies that the proportion of those having a Pap smear was between 19-22% (Gultekin et al., 2011;Gulten et al., 2012). Most male patients had never had a prostate cancer screening test as study of Harmy and et al. (2011) also found, and the reasons why this has not been adopted may be cultural. More than half of the participants in the study had not been screened for colon cancer in the previous ten years, less than 10% had been screened for colorectal cancer, and one third had had a screening when it was necessary. These results accord with the results of other studies (Newton and Galvao, 2008; Gulten et al., 2012). The results of this study show that the rates of patients participating in national cancer screening programs are not at the desired levels. Individuals should be educated on the subject of the necessity of having these tests made, even if they do not have complaints.

A cohort study reported that ingesting too much of all kinds of fat increases cancer risk (Norat et al., 2005; Bao et al., 2012; De Stefani et al., 2012; Fu et al., 2012; Yusof et al., 2012). In this study, despite the fact that it was stated by a large number of the patients that red meat was consumed once or twice a week or once or twice a month, when this figure was compared with the meat products consumed every day, it was observed that more red meat was consumed than chicken or fish. The proportion of patients who consumed red meat once or twice a month is related to income being less than expenses for over half of the patients. It was thought that the lower consumption of grilled products was related to the low income status of a great majority of the patients and the fact that they had low buying power. One third of the patients consumed legumes once or twice a month, which is insufficient. It was observed that white refined grains which do not include the bran and seed parts, such as bread and rice, which are known to increase the risk of colon cancer, were consumed in large quantities by the patients (Banque et al., 2012; Yusof et al., 2012). When it is taken into consideration that the ingestion of salt in the diet is an important risk factor for gastric cancer (Shikata et al., 2006; De Stefani et al., 2012), the frequent consumption of pickles in winter by the patients in this current study was thought to be a risk factor. Within the fat ratios used, the fact that 81.5% of the patients lived in the Aegean Region suggested that they preferred olive oil as part of their food culture. The consumption of hot spices and hot black tea are a risk factor in cancer (Mathew et al., 2000; Montaque et al., 2012). It was observed that the use of hot spices and the consumption of hot black tea every day were high, as they are traditional foods.

One limitation of the present study is that since the food consumption frequencies of the patients were based on their own declarations, they were dependent on the patients' recollections.

In conclusion, despite the fact that the study sample was not very large, it is thought that the results of this study can provide information for cancer patients in developing countries. When the conclusions of this study are taken into consideration, it can be seen that early screening was very infrequent, a sedentary lifestyle was widespread, a majority of the patients were obese, they smoked cigarettes and drank alcohol, they ate red meat but insufficient white meat, they consumed saturated fat in the form of butter, refined grains, hot spices, hot products (tea and coffee) and consumed pickles in winter, so that it can be stated that the individuals in the study had a risky lifestyle and nutritional behavior with regard to GIS cancers in particular and to other cancer types in general.

When these results are taken into account, it is important to emphasize two aspects of the actions that should be taken. The first of these, which should be realized at the primary protection level within the scope of the cancer control program, is the presentation of protective and preventive services to subjects, such as a decrease in cigarette smoking by the entire society, healthy nutrition and healthy lifestyle behavior, making individuals aware of cancer and making early diagnosis and treatment services widespread. The second aspect is to extend cancer patients' period of life after the diagnosis and treatment process, to make them conscious of risky lifestyle and nutritional behavior so that they can maintain a high quality of life, and to start initiatives in this direction that would ensure changes in behavior. In accordance with the Health for Everyone 2020 targets, it would be effective to have nurses who would undertake educational and consultancy roles in reaching targets related to cancer, included within a multidisciplinary team.

References

Acar-Vaizoğlu S, Turhan T, Temel F, et al (2010). Determination of risk factors associated with colorectal cancer and compliance with fecal occult blood testing among patients aged 50 years and over in primary health care. *Turkish J Geriatrics*, **13**, 79-86.

Al-Naggar RA, Bobryshev YV, Al-Jashamy K (2012). Practice of breast self-examination among women in Malaysia. *Asian Pac J Cancer Prev*, **13**, 3829-33.

Arafa MA, Waly MI, Jriesat S, et al (2011). Dietary and lifestyle characteristics of colorectal cancer in Jordan: a case-control study. *Asian Pac J Cancer Prev*, **12**, 1931-6.

Banqu´e M, Raid´o B, Masuet C, et al (2012). Food groups and nutrient intake and risk of colorectal cancer: a hospital-based case-control study in Spain. *Nutr Cancer*, **64**, 386-92.

Bao PP, Shu XO, Zheng Y, et al (2012). Fruit, vegetable, and animal food intake and breast cancer risk by hormone receptor status. *Nutr Cancer*, **64**, 806-19.

Barclay V (1987). Basic concepts in cancer nursing. Platin N (eds). 1st edn. Ankara, Turkey: Turkish Assoc Cancer Res Control, 11-36.

Bi Suh MA, Atashili J, Fuh EA, et al (2012). Breast self-examination and breast cancer awareness in women in developing countries: A survey of women in Buea, Cameroon. *BMC Research Notes*, **12**, 627.

Chan AT, Giovannucci EL (2010). Primary prevention of colorectal cancer. *Gastroenterology*, **138**, 2029-43.

De Stefani E, Deneo-Pellegrini H, Ronco AL, et al (2012). Boffetta P, Correa P, Aune D. Meat consumption, cooking

methods, mutagens, and risk of squamous cell carcinoma of the esophagus: A case-control study in Uruguay. *Nutr Cancer*, **64**, 294-9.

Eser S, Yakut C, Ozdemir R, et al (2010). Cancer incidence rates in Turkey in 2006: a detailed registry based estimation. *Asian Pac J Cancer Prev*, **11**, 1731-9.

Friedenreich CM, Orenstein MR (2002). Physical activity and cancer prevention: Etiologic evidence and biological mechanisms. *J Nutr*, **132**, 3456-64.

Fu Z, Shrubsole MJ, Smalley WE, et al (2012). Lifestyle factors and their combined impact on the risk of colorectal polyps. *Am J Epidemiol*, **176**, 766-76.

Gocgeldi E, Acıkeli CH, Hasde M, et al (2008). Investigation of attitudes and behaviors of a group of women who reside at in Ankara Golbasi on self-breast examination. *Fırat Med J*, **13**, 261-5.

Gultekin M, Ozgul N, Olcayto E, et al (2011). Level of knowledge among Turkish people for cancer and cancer risk factors. *J Turkish Soc Obstetr Gynecol*, **8**, 57-61.

Gulten G, Memnun S, Ayse K, et al (2012). Breast, cervical, and colorectal cancer screening status of a group of Turkish women. *Asian Pac J Cancer Prev*, **13**, 4273-9.

Gursu RU, Kesmezacar O, Karacetin D, et al (2012). Istanbul research and training hospital oncology division: 18 month results of a newly-formed unit. *Istanbul Med J*, **13**, 13-8.

Harmy MY, Norwati D, Norhayati MN, et al (2011). Knowledge and attitude of colorectal cancer screening among moderate risk patients in West Malaysia. *Asian Pac J Cancer Prev*, **12**, 1957-60.

Jemal A, Bray F, Center MM (2011). Global cancer statistics. *CA Cancer J Clin*, **61**, 69-90.

Karaca H, Berk V, Inanc M, et al (2011). Epidemiologic evaluation of the patients admitted to Department of Medical Oncology, Erciyes University, Medical Faculty, between 2006 and 2009. *J Health Sciences*, **20**, 1-8. 20.

Larsen KI, Grotmol T, Almendingen K, et al (2006). Lifestyle as a predictor for colonic neoplasia in asymptomatic individuals. *BMC Gastroenterology*, **6**, 5.

Macdonald S, Macleod U, Campbell NC, et al (2009). Systematic review of factors influencing patient and practitioner delay in diagnosis of upper gastrointestinal cancer. *Br J Cancer*, **94**, 1272-80.

Maheu C, Apostolidis T, Petri-Cal A, et al (2012). French women's breast self-examination practices with time after undergoing BRCA1/2 genetic testing. *Fam Cancer*, **11**, 269-78.

Mathew A, Gangadharan P, Varghese C, et al (2000). Diet and stomach cancer: a case-control study in South India. *Eur J Cancer Prev*, **9**, 89-97.

Montaque JA, Butler LM, Wu AH, et al (2012). Green and black tea intake in relation to prostate cancer risk among Singapore Chinese. *Cancer Causes Control*, **23**, 1635-41.

Newton RU, Galvão DA (2008). Exercise in prevention and management of cancer. *Curr Treat Option Oncol*, **9**, 135-46.

Norat T, Bingham S, Ferrari P, et al (2005). Meat, fish, and colorectal cancer risk: the European prospective investigation into cancer and nutrition. *J Natl Cancer Inst*, **97**, 906-16.

Ozaydin AN, Gulluoglu BM, Unalan PC, et al (2009). Breast cancer knowledge, source of information, and breast health practices of women in Bahcesehir. *J Breast Health*, **5**, 214-24.

Ozmen V (2008). Breast cancer in the world and Turkey. *J Breast Health*, **4**, 7-12.

Parsa P, Parsa B (2009). Effects of reproductive factors on risk of breast cancer: a literature review. *Asian Pac J Cancer Prev*, **10**, 545-50.

Pronk A, Ji BT, Shu XO, et al (2011). Physical activity and breast cancer risk in Chinese women. *Br J Cancer*, **105**, 1443-50.

Rizalar S, Altay B (2010). Early diagnosis applications of women with breast cancer. *J Fırat Health Services*, **5**, 73-87.

Sczaniecka AK, Brasky TM, Lampe JW, et al (2012). Dietary intake of specific fatty acids and breast cancer risk among postmenopausal women in the vital cohort. *Nutr Cancer*, **64**, 1131-42.

Sezer H, Yilmaz M, Gurler H, et al (2011). Breast cancer risk factors in Turkey: a hospital-based case-control study. *Asian Pac J Cancer Prev*, **12**, 2317-22.

Shikata K, Kiyohara Y, Kubo M, et al (2006). A prospective study of dietary salt intake and gastric cancer incidence in a defined Japanese population: the Hisayama study. *Int J Cancer*, **119**, 196-201.

Soares PB, Quirino Filho S, Souza WP, et al (2012). Characteristics of women with breast cancer seen at reference services in the North of Minas Gerais. *Rev Bras Epidemiol*, **15**, 595-604.

Tuncer M (2009). An importance of cancer in our country and in the world, disease burden and cancer control politics. In: Cancer Control in Turkey. Koza Press, Ankara, Turkey.

Turkish Statistical Institute. Global Adult Tobacco Survey 2008, General Directorate of Primary Health Care Services, Turkey Adult Tobacco Survey 2010.

Yildiz E (2008). Cancer and nutrition. Ankara, Turkey: Republic of Turkey Ministry of Health Publications, No: 728.

Yoo BN, Choi KS, Jung KW, et al (2012). Awareness and practice of breast self-examination among Korean women: results from a nationwide survey. *Asian Pac J Cancer Prev*, **13**, 123-5.

Yusof AS, Isa ZM, Shah SA (2012). Dietary patterns and risk of colorectal cancer: a systematic review of cohort studies (2000-2011). *Asian Pac J Cancer Prev*, **13**, 4713-7.