RESEARCH COMMUNICATION

Eating Habits, Knowledge about Cancer Prevention and the HPLP Scale in Turkish Adolescents

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Abstract

Background: Nutritional status and healthy lifestyle are important factors not only in cancer etiology but also for prevention efforts. A good nutritional status contributes to a healthy life with high economic, social and cultural level. Unhealthy eating habits are part of risky behavior seen from adolescence. The present study was therefore carried out to determine eating habits, level of knowledge about cancer prevention and behavior of a group of adolescents. **Methods:** Data were collected using questionnaire covering eating habits and knowledge of adolescents on prevention from cancer, and special scale (HPLP) to determine the related behavior. Three hundred sixty six of 390 students volunteered for study. **Results:** Eating habits and the level of cancer prevention knowledge were similar for both genders, except for the exercise issue. The mean total points of adolescents in the Health Promotion Behavior and Subscales was 113,63. While spiritual growth had the highest score in HPLP subscale, exercise had a minimal score. Exercise was the only HPLP subscale with a statistically significant difference between male and female genders. **Conclusions:** Although they have some information, the adolescents surveyed did not have preventive skills relative to their practical life. In general in order to ensure cancer prevention and a healthy life style social, cultural and sportive activities should be encouraged and educational programmes supporting these goals should be designed and applied for all stages of life, starting in early childhood.

Key Words: Adolescence - nutrition - eating habits - cancer prevention - HPLP scale

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Introduction

Nutritional status and healthy lifestyle are important factors not only in cancer etiologic but also in prevention of cancer. Good nutritional status of persons is one of the important factors in living a healthy life with high economical, social and cultural level. Breast, colon and gastric cancers are the cancers that the nutritional status and lifestyle are among the etiological factors. Some wrong nutritional behavior also has an important role in the development of mouth, larynx, lung, and breast and liver cancers (Greenwald et al., 2001; Murillo and Mehta 2001). Eating habits are important; especially there is the evidence that diet may affect the risk of cancer in adolescence (Frazier et al. 2003).

There has been considerable number of studies trying to explain the relation between cancer and nutrition in the last 25 years (Terry et al., 2001; Dyer et al., 2004; Michael 2004). Many cohort studies have shown that intake of enough amounts of fruits and vegetables have a preventive effect on cancer development, and vice versa

(Serdula et al., 1995; 1996; Van Duyn and Pivonka, 2000; Neumark-Sztainer et al., 2003).

The complex process of carcinogenesis is mainly due to environmental factors and therefore preventable. Diet may account for about 35% of cancer cases; -risk factors and protective factors are discussed (Eichholzer, 1997). In accordance with the results of previously published studies; especially fruits and vegetables probably reduce the risk for cancers of the oral cavity, esophagus, stomach and colorectal, and diets should include at least 400 g/d of total fruits and vegetables. Preserved meat and red meat probably increase the risk for colorectal cancer; if eaten, consumption of these foods should be moderate. Salt preserved foods and high salt intake probably increase the risk for stomach cancer; overall consumption of salt preserved foods and salt should be moderate (Key et al., 2004).

Overweight/obesity increases the risk factor for the cancers of the esophagus (adenocarcinoma), colorectal, breast (postmenopausal), endometrial and kidney; body weight should be maintained in the body mass index range

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of 18.5-25kg/m², and weight gain in adulthood should be avoided (Frazier et al., 2003; Greenwald et al., 2001).The National Cancer Institute estimates that at least 35% of all cancer cases are connected with nutritional factors. In the presence of some additional risk factors in lifestyle such as smoking and lack of exercise and stress, this ratio can be calculated as 85% of all cancers (Carolyn, http://www.cancernutrition.com).

The relation between cancer and nutritional status has some differences from region to region, and from country to country. There are some studies indicating the role of regional nutrition traditions in cancer development (Caderni et al., 1993; Englyst et al., 1982; Joessens and Geboers 1981). A healthy lifestyle is widely recognized as important in preventing disease and disability (Walker et al., 1998). If we want to measure healthy lifestyle on population groups, we may use an instrument to measure health-promoting life-style. Lifestyle changes in persons diagnosed with cancer are important because they may impact prognosis, co-morbidities, and survival (Au, 2004; Celentano, 1991).

Adolescence is generally described as a transitional phase of development that begins at the onset of puberty and continues into early adulthood. They typically become more independent in their decision-making and lifestyle behaviors at this stage (Spear and Kulbok, 2001).

Unhealthy eating habits are risky behaviors seen in adolescence (Kann et al., 2000). There are many factors which affect adolescents' eating habits. Some of these factors are personal characteristics, such as, age, gender, educational status, and marital status, socioeconomic status, some characteristics associated with the cultural, traditional and social environments in which individuals live, and what individuals think about their own bodies, perceptions, genetic factors, lifestyle, and habits; all of these factors can have an effect on individuals' choice of unhealthy or healthy behaviors (Aslan et al., 2003; Neinstein and Schack, 2002). Characteristics of eating are closely associated with their perceptions and thoughts about their own bodies. Because adolescents frequently experience changes in their perceptions and body image they can be very influential. For this reason adolescents are at risk for negative eating behaviors (Neinstein and Schack, 2002). A healthy lifestyle is widely recognized as important in preventing disease and disability (Walker et al., 1998).

The Health and Behavior in Teenagers Study (HABITS) was set up to produce some more definitive answers with respect to the adoption, development, and change in health behaviors, which are related to adult cancer risk. Adolescents become increasingly independent in decision-making, and take progressively more responsibility for social activities, leisure activities, and lifestyle. They also begin to assume responsibility for their own health-related choices and must develop an understanding of how to promote and protect health (Wardle et al., 2003). Sixty percent of Turkish population is under the age of 25 (T.R.Turkish National Population Surveillance-2003). Nutritional problems are important problems in this age group as much as smoking, drug addiction and some psychological problems (Story et al.,

2002). Most of nutritional traditions, behaviors and, health lifestyle can be gained at this age group.

The study was carried out to determine the level of knowledge adolescents have on the relation between prevention of cancer and eating habits. Another aim of the study was to determine the behaviors of healthy living styles of adolescents.

Materials and Methods

Study population

This study, designed as descriptive and cross-sectional, was conducted between April 1st and June 30th, 2003 from five Vocational High School for Health of Amasya. In total there were 390 students in five schools during the 2002-2003 academic years. Vocational high schools for health train young people for occupations as assistant health personnel in various branches of the health care field. Along with general high school courses the students also receive training in departments such as, Emergency Medicine, Laboratory Technician, Environmental Health Technician, and Medical Secretary (http://sdb.meb.gov.tr/tasra/amasya.htm). More than half (58.5%) of the participants were studying in the Medical Secretary Department.

A total of 366 students having education in high school took part in the study as the experiment group containing 71% female and 29% male who were present at the school at time of the study; were asked to complete the questionnaire by the researchers. The aim of the study and the contents of the questionnaire were explained to each subject, and voluntary participant was requested. Verbal consent was obtained from each student. Approval to conduct the study was obtained from each school's directorate and The Amasya Ministery of Health Ethics Committee.

Measurement of the variables

All the data were collected by using special form, which was designed according the most recent information in literature. This form has two parts. Part I contains questions on the nutritional status, eating habits and knowledge of adolescents on cancer prevention. Eating habits of adolescents was assessed with the following question: "During the past seven days how many times did all or most of your meals contained meat, vegetable, grain, and fruit?". Response categories were "never, 1 or 2 times, 3 or 4 times, 5 or 6 times, and more than 7 times". For some of analyses, groups were regrouped as "never, and 1 or 2", for "yes"; "3 to 6 times," and "7 +9 times a week", "not existing".

Part II contains special scale (Health Promotion Life-Style Profile=HPLP) to determine the behaviors of adolescents related to their healthy life style. HPLP was developed by Walker, Sechrist and Pender in 1987 by the alpha value of 0.92 Health Promoting Lifestyle Profile (HPLP): 48 items measuring health-promoting lifestyle. Self-initiated health behaviors that serve to maintain or enhance level of wellness, self-actualization, or wellness, based upon the Health Promoting Model (Walker et al., 1998). The scale includes both health-protecting

(preventive) behaviors that decrease risk for illness, health promoting behaviors that sustain or increase well-being, self-actualization, and personal fulfillments. It is accurate and current and the scale has been used in many similar studies.

HPLP was adapted to Turkish population at 1997 by Esin (Esin, 1997). It contains 48 items and 6 subgroups. Those are; spiritual growths, health responsibility, exercise, nutrition, interpersonal relations, stress management. Each of them can be used separately or together. Total point reflects the healthy life style point. Pointing can be done by using "never=1", "sometimes=2", "often =3", "regularly=4". The lowest point is 48, the highest point is 192. Alpha score in our study was found as 0.90 that is similar to studies performed by Walker, Sechrist and Pender (Walker et al., 1987).

Table 1. Distribution of Demographic Factors by Gender

	Total (366)	Girls (260)	Boys(106)	P value
Age	17.0 ± 1.22	16.8 ± 1.14	17.4 ± 1.31	0.03
Weight	54.7 ± 8.12	52.2 ± 6.41	60.6 ± 8.62	0.00
Height	165 ± 8.43	161 ± 6.11	173 ± 7.35	0.00
BMI (kg/m²)	20.2 ± 2.37	20.3 ± 2.32	20.2 ± 2.48	0.70

Data are mean and SD.

Table 2. Distribution of Adolescents' Consumption of Food by Gender

Food Consumption		Total	Girls	Boys	p value
Meat *	Yes	8.7	7.3	12.3	0.12
	No	91.3	92.7	87.7	
Vegetables**					
	Yes	36.3	35.8	37.7	0.72
	No	63.7	64.2	62.3	
Grains***					
	Yes	14.5	11.9	20.8	0.02
	No	85.5	88.1	79.2	
Fruits****					
	Yes	35.5	35.8	34.9	0.87
	No	64.5	64.2	65.1	

*Meat: beef, chicken, fish, meatballs, **Vegetables: tomatoes, beans, beets, corn, peas, mixed vegetables, spinach, peppers, carrots, potatoes, onions, garlic, *** Grains: cereal, bread, cornbread, biscuits, pasta, rice, popcorn, pizza, sandwiches, macaroni, **** Fruits: grapes, melons, pears, oranges, strawberries, peaches, cherries, apples

Table 3. Distribution of Knowledge of Cancer Prevention by Gender

Knowledge*	Total	Girls	Boys	P value
Consume less animal fat	65.6	68.1	59.4	0.11
Reduce sodium intake	62.8	65.4	56.6	0.11
Consume fruit, vegetable and cereal products				
daily	78.7	78.8	78.3	0.90
Focus on green, yellow and red colored fruits				
and vegetables	58.2	58.5	57.5	0.87
Prevention of obesity	80.3	82.7	74.5	0.07
Avoid excess alcohol intake	83.9	86.2	78.3	0.06
Avoid salt-cured, salt-pickled or smoked				
preserved foods	44.0	46.2	38.7	0.19
Take at least 30 minutes gentle exercise				
twice a week	82.5	85.4	75.5	0.02

(*per cent with correct response)

Analytical Procedures

Demographic variables, eating habits, and ratio of correct responses related to cancer prevention were assessed by using Chi square test. Level of HPLP subscale scores were analyzed by using t test. Data analysis was performed in SPSS 11.0 software program. P value of <0.05 was regarded significant.

Results

The mean age of the adolescents was 17.0 ± 1.22 years and boys were marginally older than girls (t=2.19, p=0.03). About 84% of all adolescents were in the age group of 16-18 (n=307). The average height of the adolescents was 165 ± 8.4cm and weight was 54.7 ± 8.12kg. The mean BMI was 20.2 ± 2.37; boys were taller, heavier and had a higher BMI than girls (Table 1). Approximately 57% (n=210) of adolescents were born in Amasya and 41.8% were living in Amasya. About 11% of all adolescents were smoking, 71% of all adolescents' mothers and 47% fathers were elementary school graduates. The job status of the fathers was farmers (24%). Family budget is balanced to match the income of the family and expenses in 63.7% of all adolescents. The cancer related death rate was 10.5% in the families.

Associations between eating habits of adolescents by gender are shown in Table 2. Eating habits of adolescents by gender were similar. Although girls consumed healthy eating more than boys, we didn't find any significant difference by gender, except for the consumption of grain. The consumption of vegetable in general diet has a ratio of 36.3%. The most consumed foods in the study group were fruits and vegetables. While vegetables and meat are eaten in fried form in adolescents and their families, fruits are mostly eaten as raw.

Table 3 reveals the distribution of knowledge of cancer prevention by gender (* per cent with correct response). Correct responses, for all the adolescents, included the consumption of less animal fat (65.6%), reduction of sodium intake (62.8%), daily consumption of fruits, vegetables and cereal products (78.7%), focus on green, yellow and red color fruits and vegetables (58.2%), prevention of obesity (80.3%), avoidance of excess alcohol intake (83.9%), avoidance of foods preserve by salt curing, salt–pickling or smoking (44.0%), taking at least 30 minutes gentle exercise twice a week (82.5%). Even though the girls have had higher correct responses, the results indicate that there is no significant gender difference in knowledge of cancer prevention. But in the last question about exercise, the girls have significantly higher correct response than the boys (χ=5.12, p=0.02). While the highest ratio of correct responses in nutrition related to prevention from cancer was "avoidance of excessive amount of alcohol intake (83.9%)", the lowest ratio of correct responses was "avoidance from foods preserved by salt-curing, salt–pickling or smoking" (44%). The mean of total point of adolescents in Health Promotion Behaviors and Subscales was 113.63 ± 17.33.

Table 4 summarizes the means and standard deviations and t values for each of the six scales. The statistical analyses did not indicate any significant difference

Table 4. Distribution of Mean Scores on Health Promotion Behavior and Subscale (HPLP) by Gender

HPLP Score	Total	Girls	Boys	t	P value
Spiritual Growth	33.3±6.4	33.2±6.0	33.7±7.2	0.61	0.57
Health responsibility	19.9±4.1	20.0±4.2	19.7±4.3	0.65	0.51
Nutrition	15.0±4.2	15.1±2.9	15.0±3.0	0.28	0.77
Interpersonal relations	19.1±2.9	19.1±3.5	18.9±3.9	0.43	0.66
Exercise	9.4±3.6	9.0±2.6	10.5±3.0	4.82	0.00
Stress management	16.8±2.8	16.9±3.4	16.7±3.8	0.62	0.53
Total HPLP	113±17	113±16	114±20	0.56	0.60

Data are means plus SDs

between girls and boys in five subscales; however, there was a significant difference only in exercise subscale (t=4.82, p=0.00). Although girls practiced better nutrition, interpersonal relationships, health responsibility, and total HPLP than men, the differences were found not to be statistically significant.

Discussion

We found that associations between eating habits and knowledge about cancer prevention of adolescents by gender were almost similar. Also in the study similar results were found in total of HPLP score for adolescent boys and girls. The highest score was spiritual growth and the lowest score was exercise in HPLP. Healthful eating and physical activity were not considered high priorities, despite having ample free time, high exercise self-efficacy, positive outcome expectations for exercise, and a desire to exercise more for college students. Participants reported that regularly engaging in exercise was difficult (Strong et al., 2008).

Eating habits are very important for a healthy life. Low fruit and vegetable intake in addition to high-oil content of diet and low physical activity-life style can cause an increase in the incidence of colon, prostate, lung, breast and total cancer incidence (Platin, 1992). Pryor et al. conducted a case-control study of adolescent diet and cancer (Pryor et al., 1989). In our study group the most consumed foods were fruits and vegetables and meat was less consumed. Meat consumption was 8.7 % for adolescent in our study. In the study that was conducted by Milligan, meat consumption was found to be 27% in men, 25% in women (Milligan et al., 1998). If we consider these results, we can explain the reason why our study groups have less meat eating habits and more fruit and vegetable eating. In the region of Amasya, apple, peaches, cherry, pears, okra, onion and garlic are mostly produced fruits and vegetables. This can explain why the percentage of consumption of vegetables and fruits is so high in this region (Turkish Prime Ministry Population Statistics.; T.R.Amasya Valiligi).

We examined distribution of knowledge of cancer prevention by gender. Adolescents in our study have a moderate level of knowledge in nutritional regulations for preventing from cancer. Another study performed on students has shown that they have a low level of

knowledge on nutrition and cancer prevention, but they are quite willing to learn more. Although girls had higher point of correct responses, the results showed no statistically significant difference based on gender differences in knowledge of cancer prevention except for the last question. Our study has a point of 78.7% for vegetables and fruits, this ratio were 39% in the study conducted in New Orleans (Beech et al., 1999). The explanation for this difference would be the different nutritional habits and traditions of different geographical areas.

The mean of total point of adolescents in Health Promotion Behaviors and Subscales was found to be lower than the points obtained from the previous studies in Turkey (Esin, 1997; Sayan, 1998). It can be said that HPLP scoring system is directly related to socio-economic situations and regional cultural effects in our study. In our study, the highest HPLP subscale score was obtained in the section of spiritual growth, which is directly related to structure of population as our population can be defined as closed and traditional.

Previous studies performed in Turkey have shown similar results and support our findings (Esin, 1997; Sayan, 1998; Unalan et al., 2007). Different studies from different countries reported different spiritual growth scores as higher points in USA (Hawks et al., 2002), lower points in Japan (Hawks et al., 2002), Hong Kong (Hui, 2002), Canada (Chalmers et al., 2004; Haddad et al., 2004), Taiwan (Chen et al., 2001) and Jordan (Haddad et al., 2004).

Our study has definitely showed the cultural effect on Health Promotion Behaviors and Subscale in adolescent groups. Adolescents in our study have low-moderate level of "health responsibility" points. Since they are in the transition period from childhood to adult period, they are not supposed to have enough and advanced health responsibility. This result for this reason can be normal. In our study the lowest mean scores were in exercise and there was a statistically significant difference between girls and boys about it. The score was far below that of the highest score of spiritual growth.

Data from Hui indicate that the student nurses performed best in interpersonal relations but worst in physical activity (Hui, 2002). Although girls have higher points regarding the relationship between exercise and prevention of cancer in theoretical aspect, they are mostly incapable to convert this knowledge into practice. This can be explained by the low affinity of Turkish women for sportive activities.

In conclusion, it was detected that adolescents participating in this study have moderate level of knowledge on cancer prevention. Although they have some information, they are unable to have preventive skills in their practical life. In general in order to ensure cancer prevention and a healthy life style social, cultural and sportive activities should be encouraged and educational programmes supporting these goals should be designed and applied in all stages of life, starting in early childhood and carrying on through to adult life.

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