HIGH SCHOOL STUDENTS' KNOWLEDGE
LEVEL OF, ATTITUDES TOWARD AND
INTEREST IN CANCER

A MASTER'S THESIS

BY

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THE PROGRAM OF CURRICULUM AND INSTRUCTION
İHSAN DOĞRAMACI BILKENT UNIVERSITY
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To my father

High School Students' Knowledge Level of, Attitudes toward and Interest in Cancer

The Graduate School of Education

of

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by

Ilgın Yıldırım

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May 2017

I certify that I have read this thesis and have found that it is fully adequate, in scope and in quality, as a thesis for the degree of Master of Arts in Curriculum and Instruction.

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ABSTRACT

HIGH SCHOOL STUDENTS' KNOWLEDGE LEVEL OF, ATTITUDES
TOWARD, AND INTEREST IN CANCER

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May 2017

Cancer is one of the most common diseases in recent years. However, there are very few studies which investigate adolescents' cancer awareness and thoughts about cancer in Turkey. This research explored high school students' ($N= 275$, %56 female and %44 male students) level of knowledge about risk factors, attitudes toward and interest in cancer. The required data were collected from three private schools in Ankara and one private school in Erzurum via questionnaire. Statistical Package for Social Sciences (SPSS, v.24.0) was used to analyze the data. The results indicated that most of the students were successful at identifying cancer risk factors except for "overweight" and all non-carcinogenic factors. In addition, most of the participants had negative attitudes toward cancer, whereas they did not tend to exhibit cancer protective behaviors. Furthermore, most of the participants were not interested in "cancer topic." In addition, female students had more negative thoughts and tended to exhibit more protective behavior toward cancer than male students. However, no gender difference was found in terms of the students' level of knowledge about risk factors and interest in cancer. In the direction of these results, the current study suggests that exploring high school students' existing level of knowledge, beliefs, attitudes and interests about cancer contribute to teachers, curriculum and lesson material developers to form an effective cancer education.

Key words: Cancer, risk factor, knowledge, affect, behavior, cognitive component, tri-partite model of attitudes

ÖZET

LİSE ÖĞRENCİLERİNİN KANSER RİSK FAKTÖRLERİYLE İLGİLİ BİLGİ DÜZEYİ, KANSERE KARŞI TUTUM VE İLGİLERİ

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Kanser, günümüzde en yaygın olan hastalıklardan birisidir. Ancak, Türkiye'de buluğ çağındaki gençlerin kanser farkındalıklarını ve kanserle ilgili düşüncelerini inceleyen çok az çalışma bulunmaktadır. Bu çalışma, lise öğrencilerinin (*N*= 275, %56 kız ve %44 erkek öğrenci) karsinojenik faktörlerle ilgili bilgi düzeyini, kansere karşı tutum ve ilgilerini araştırmıştır. Gerekli veri, üçü Ankara'da biri Erzurum'da bulunan özel okullardan anket aracılığıyla toplanmıştır. Veri analizi Sosyal Bilimler İstatistik Programı (SPSS, v.24.0) ile gerçekleştirilmiştir. Elde edilen sonuçlar "aşırı kilo" dışında öğrencilerin bütün karsinojenik olan ve olmayan faktörleri belirlemede başarılı olduğunu göstermiştir. Ayrıca, katılımcıların çoğu kansere karşı olumsuz düşüncelere sahip olmasına rağmen, kanserden korunma davranışları gösterme eğiliminde değillerdir ve "kanser konusu" nu ilginç bulmadıklarını belirtmişlerdir. Buna ek olarak, kız öğrenciler erkek öğrencilere kıyasla kansere karşı daha olumsuz düşüncelere sahiptir ve daha çok kanserden korunma davranışı gösterme eğilimindedir. Fakat risk faktörleri ve kanser konusuna karşı duyulan ilgi açısından herhangi bir cinsiyet farklılığı bulunmamıştır. Bu sonuçlar doğrultusunda, mevcut çalışma öğrencilerin kanser bilgi düzeylerinin, kansere karşı tutum ve ilgilerinin belirlenmesinin öğretmenlere, eğitim programları ve ders materyali geliştiren kişilere etkili bir kanser eğitim programı oluşturmak açısından faydalı olacağını ileri sürmektedir.

Anahtar Kelimeler: Kanser, risk faktörü, bilgi, bilişsel, davranışsal, duyuşsal, üçlü tutum modeli

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CHAPTER 1: INTRODUCTION

Introduction

Cancer is one of the most prevalent diseases in the world that causes death (Torre et al., 2015). For this reason, education plays an important role in cancer prevention and creating awareness about the importance of early diagnosis and treatment methods. Also, to educate people about cancer from their adolescence is valuable and necessary in terms of internalizing the knowledge. Therefore, a thoughtfully developed cancer education program will contribute to increasing teenagers' awareness about cancer and change their attitudes toward it. Before developing a cancer education program for teenagers, to determine their current knowledge level of, and attitudes towards cancer will be useful to develop a more effective education program, and the highlight points about cancer can be detected (Knighting, Rowa-Dewar, Malcolm, Kearney, & Gibson, 2011).

This study explores high school students' level of cancer knowledge about risk factors, attitudes and interests toward cancer. It is hoped that this study enables curriculum developers to create an effective health education curriculum regarding cancer.

This chapter includes a general overview for the current study. The chapter consists of background information, the statement of the problem, and the purpose, the research questions, the significance and definition of the key terms respectively.

Background

Cancer is the abnormal division and growth of cells. Division and growth are seen in all organisms. However, cells are regulated by series of events to divide and grow properly. While replication of normal cells stops at some point, cancer cells are able to divide forever. Because of mutation in the genes that regulate and control some functions of cell cycle, cells start to grow and divide uncontrollably. As uncontrollable cell division continues, more mutation occurs and cancer spreads to other parts of the body. Thus, healthy tissues are invaded by the mutant cells and organs cannot function normally (Schneider, 2001).

Cancer is one of the major causes of death in both developed and developing countries today. Due to overpopulation and population aging, the number of cancer patients gradually increase. In addition, some life style choices such as smoking, physical inactivity, consumption of unhealthy nutrients and reproductive changes increase cancer cases. Researchers estimate that there are 14.1 million people who are diagnosed with cancer and 8.2 million people who die because of cancer in 2012 in all parts of the world (Torre et al., 2015). Moreover, the World Health Organization (WHO) foresees that the number of people who suffer from cancer will increase by 50% worldwide by 2020 (Knighting et al., 2011).

The 2012 Turkey Cancer Statistic Report indicated that although the incidence of cancer in Turkey was lower than economically developed countries such as the USA and in the European Union, it was higher than the world average. In 2012, 105,404 males and 70,897 females got cancer. Breast cancer was the most diagnosed cancer type among females, whereas lung and prostate cancers were the most common cancer types observed in males. Among children, leukemia was the most prevalent

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cancer type, and young adults (male and female young people who were 14-15 years old) suffered most from testicular and thyroid cancers (Gültekin et al., 2015). In the light of this statistical information, a targeted health education program which is based on common cancer types can be prepared. Also, for an effective targeted health education program, students' existing knowledge can be investigated.

Pintrich, Marx and Boyle (1993) suggest that students' existing knowledge affect their whole learning process. In addition to knowledge-which is a part of cognitive component of attitude (Breckler, 1984)- affective dimension of attitude is important in learning as well (Pintrich et al., 1993). According to Heuckmann and Asshoff's study (2014), besides the knowledge, making right decisions about cancer prevention is affected by the feelings (affective dimension of attitude) towards cancer. Attitude is divided into three components as cognitive, affective and behavioral. Behavioral component refers to actions while cognitive component includes knowledge and beliefs. Affective dimension is related to feelings (Breckler, 1984), and it includes interest as well (Heuckmann & Asshoff, 2014). Krapp (2007) argues that the source of interest is positive emotions and curiosity. He also states that interest has an important effect on learning process as a motivational factor. It causes changes on individuals' cognitive process. A person who is interested in a particular issue or area would like to obtain more information about that (Krapp, 2007). Furthermore; Schernhammer, Haidinger, Waldhör, Vargas, and Vutuc (2010) state that the knowledge may play a role on changing attitudes. Therefore, education is important since it contributes to gain new knowledge.

In the literature, there are several studies which show that health education has

positive effects on knowledge and attitudes (Soweid, Kak, Major, Karam, & Rouhana, 2003; Wang, Stewart, Chang, & Shi. 2015; Haghani, Shahnazi, & Hassanzadeh, 2017). A study conducted in China (Wang et al., 2015) indicated that the participants who received nutrition education knew more about nutritional content of vegetables, dairy products, beans and meat. In addition, the percentage of the students who thought that nutrition was important for a healthy life was higher in the educated group. Furthermore, the results showed that the students who received education consumed vegetables and had breakfast every day. Similarly, Hill et al. (2010) explored the effects of cancer education on knowledge and attitudes. The results showed that the participants level of knowledge increased after the education. Moreover, the education program changed the participants' fatalistic attitude towards cancer. Besides, the participants stated that they tend to behave in a more proactive way againts cancer after the education. As the studies in the literarure suggested, education has a noticeable effect on students' knowledge and attitudes towards cancer. However, an education which focuses on students' needs may be more efficient against cancer.

Health education that is based on a target group's knowledge and beliefs is likely to be effective in preventing cancer. Exploring children's understanding of cancer, healthy or unhealthy living habits is necessary to develop health initiatives that are based on their existing knowledge level and awareness (Knighting et al., 2011). Increasing the cancer awareness of adolescents encourages them to adopt more healthy life styles and allows for early diagnosis (Kyle, Forbat, & Hubbard, 2012).

Although Nutbeam (2006) stated that education was a significant factor on

promoting health, he also suggested that a health education which was based on only transfer of knowledge was not successful in terms of health promotion in 1960s and 1970s. Therefore, various theories were developed to improve educational programs such as theory of planned behavior and social learning theory. These theories have helped to improve educational programs in order to encourage behavioral changes. However, this improvement in educational programs has not been sufficient to create sustainable behavior changes for health (Nutbeam, 2006). Becker, Xu, and Chaney (2016) suggest that implementation of 7C framework (Challenge, Courage, Commitment, Competence, Connection, Contribution, and Consequences) in health education will contribute to health promotion. The framework aims to integrate the knowledge into behaviors. According to the philosophy of 7C framework, teachers do not directly give information to students, but students are encouraged and motivated to acquire knowledge.

There are some problems in cancer education in various countries. Heuckmann & Asshoff (2014) reported that, cancer was not a compulsory topic to teach in the curriculum in Germany and other countries. This means if teachers do not want to teach the topic, it may not be covered in the classroom. But, a study conducted in Britain demonstrated that British teachers were enthusiastic to teach students about cancer (Cribb, 1990). However, another study claimed that the UK teachers did not have adequate knowledge about it, and for that reason they did not feel comfortable in teaching cancer (Carey, 1992). Moreover, Sugisaki et al. (2014) stated that cancer education materials related topics existed only at high school curriculum and primary school curriculum was more interested in other diseases in Japan. They further reported that although cancer education was an important issue in Japan, a

curriculum that provided necessary cancer understanding for students was not described.

In Turkey, students take health course at ninth grade. Unit 5 that is called "Harmful Habits for Health" associates cancer with smoking. In addition, unit 7 that is called "Basic Concepts and Principles about Diseases" teaches students about cancer risk factors and symptoms of cancer. At the end of the unit, students are expected to explain the importance of early diagnosis and therapy of cancer, and list the ways of prevention. The curriculum recommends teachers to ask students to create a bulletin board that includes magazines, brochures, posters, banners, and articles on cancer. Teachers are encouraged to explore the extent to which the students' awareness on cancer developed, and teach about the methods of prevention from cancer, the importance of early diagnosis, and achievements in the treatment by taking into account students' opinions (MoNE, 2012).

Another issue to consider in health education is gender differences. Several studies show that there are some differences between female and male students in terms of their level of knowledge on cancer and attitudes towards it (Kyle et al., 2012; Heuckmann, & Asshoff, 2014). Kyle et al. (2012) stated that male students' level of knowledge on cancer symptoms and common cancer types were lower than females. Moreover, Tempark et al. (2012) reported that male students spent more time under the sun and less used sunscreen than female students. Similarly, Heuckmann and Asshoff (2014) argued that female students tend to behave in a more proactive way towards cancer than males. Besides, Heuckmann and Asshoff (2014) and Kyle et al. (2012) reported that there were emotional differences between female and male

students. They suggested that female students had stronger negative feelings about cancer. In the light of these findings, besides students' current knowledge and attitudes about cancer, gender differences should be considered while preparing a health education program.

Adopting a healthy life style starting from childhood may prevent many diseases such as cancer (Knighting et al., 2011). Studies show that teaching about cancer and cancer prevention changes students' attitudes toward cancer in terms of protection against it (Heuckmann & Asshoff, 2014). Information about symptoms, causes of cancer and the ways of cancer prevention should be taught from puberty to increase cancer awareness (Sugisaki et al., 2014). Identifying people's beliefs and sources of these beliefs are necessary to make their cancer understanding and behaviors become different toward cancer (Schernhammer et al., 2010). Creating a curriculum, according to students' knowledge level, beliefs and attitudes toward cancer enable them to prevent cancer and other chronic diseases. Also, it helps them to adopt healthier lifestyles (Knighting et al., 2011).

Problem

Studies conducted in Germany, Japan, and UK indicate that students' knowledge on cancer is insufficient even in developed countries. They are not familiar with many cancer types. Therefore, it is necessary to know students' existing levels of knowledge, as well as their attitudes and interests toward cancer in order to develop more effective health curriculum or program and healthy new generation (Heuckmann & Asshoff, 2014; Kyle et al., 2012; Sugisaki et al., 2014). Many health education programs or curricula prepared for children and young people are not

based on their understanding, knowledge and beliefs (Oakley, Bendelow, Barnes, Buchanan, & Husain, 1995).

In Turkey, the incidence of cancer increases day by day. Therefore, community awareness is very important to prevent and fight against cancer. Gültekin, Özgül, Olcayto, and Tuncer (2011) conducted a survey for 3,096 Turkish participants who were older than 18 years old in order to measure their awareness about cancer. The results of the study indicated that the participants' knowledge level was too low. In light of this research, developing more effective cancer fighting activities were proposed. However, Karayurt, Özmen, and Çakmakiçi Çetinkaya (2008) noted that there were few studies that investigated high school students' awareness and their knowledge level about cancer.

Purpose

The purpose of this study is to determine Turkish high school students' levels of knowledge, attitudes toward cancer from the points of cognitive, affective and behavioral dimensions, and their interest in the disease. Moreover, this research aims to explore whether there is a difference between female and male students in terms of their levels of knowledge on cancer, risk factors causing cancer, attitudes and interest toward cancer. Furthermore, the relationship will be sought among their levels of knowledge of cancer risk factors, attitudes and interest toward cancer.

Research questions

The following research questions are investigated in this research:

1. What are Turkish high school students' levels of knowledge on cancer risk factors?

2. Is there a difference between female and male students' knowledge on risk factors causing cancer?

3. What are Turkish high school students' attitudes toward cancer?

4. Is there a difference between female and male students in terms of their attitudes toward cancer?

5. Which aspects of cancer stimulate the most interest among high school students?

6. Is there a difference between female and male students in terms of their interest in learning about cancer?

7. Is there a relationship among students' knowledge on risk factors leading to cancer and their attitudes and interests toward cancer?

Significance

This research aims to assess high school students' attitudes and interest about cancer as well to gain insights into their awareness of cancer risk factors. Although there are many studies that investigate undergraduate students' and adults' cancer awareness, there are few studies that explore high school students' knowledge, attitudes and behaviors regarding cancer. Firstly, determining high school students' attitudes and interests toward cancer is important in creating awareness and healthy new generations by focusing on their expectations, life style choices, interests and existing knowledge level about cancer.

Secondly, taking into account high school students' cancer understandings, perceptions and viewpoints enables teachers to shape their health courses according to students by being aware of the points that are needed to emphasize about cancer.

Thus, students' learning process may become more efficient and the amount of knowledge to be acquired might become more meaningful and permanent.

In addition, curriculum developers can create a new curriculum or change the existing curriculum according to students' interests, expectations and knowledge level about cancer. The curriculum that is prepared by considering students' cancer understanding will be more useful to create cancer awareness. Moreover, the results of this study will contribute to material designers in developing course materials which would facilitate students' learning and increase students' awareness on cancer. The students who take health education that focuses on their existing information regarding cancer, interests in and attitudes toward it from adolescence, would become more conscious in adopting a healthy life style, preventing themselves from cancer, and observing its symptoms and the importance of early diagnosis.

Definition of key terms

Cancer: a serious disease caused by cells that are not normal and that can spread to one or many parts of the body (Merriem-Webster's online dictionary, n.d.)

Risk factor: something that increases risk or susceptibility (Merriem-Webster's online dictionary, n.d.)

Attitude: "A response to an antecedent stimulus or attitude object" (Breckler, 1984, p. 1191).

Tripartite model of attitude: "A prevalent model of attitude structure specifies three components: affect, behavior, and cognition" (Breckler, 1984, p. 1191).

Affect: "An emotional response, a gut reaction, or sympathetic nervous activity" (Breckler, 1984, p. 1191).

Behavior: "Includes overt actions, behavioral intentions, and verbal statements regarding behavior." (Breckler, 1984, p. 1191).

Cognitive component: "Beliefs, knowledge structures, perceptual responses, and thoughts constitute the cognitive component." (Breckler, 1984, p. 1191).

Knowledge: the fact or condition of knowing something with familiarity gained through experience or association (Merriem-Webster's online dictionary, n.d.).

Interest in knowledge: the feeling of wanting to give your attention to something or of wanting to be involved with and to discover more about something (Cambridge's online dictionary, n.d.).

CHAPTER 2: REVIEW OF RELATED LITERATURE

Introduction

This research investigates Turkish high school students' levels of knowledge regarding the risk factors of cancer, attitudes and interests toward cancer. This chapter starts with a general of cancer. Then, statistical information about cancer is presented in the chapter. Moreover, the chapter discusses the importance of cancer education and the studies about students' cancer education at high schools in the world and Turkey respectively. Finally, the previous studies about students' understanding of cancer, beliefs, expectations or attitudes and interests in cancer are given.

Cancer

Cancer, that is also known as malignant tumors, is an uncontrolled cell division where cancer cells tend to proliferate in an unlimited way. In cancer disease, abnormal gene expression is observed and this situation causes certain impacts on gene transcription, translation and DNA such as gene mutations, translocations and amplifications Because of this abnormal growth of cells, multicellular organisms cannot function in correct way and perform the activities of the regularity system that controls cell differentiation and proliferation. Cancer cells act like a unicellular organism because they do not function collaboratively. Furthermore, tumor cells may release effector molecules that damage the body (El-Metwally, 2009; Ruddon, 1995).

Characteristics of cancer cells

Tumors are classified as benign or malignant. Malignant tumors are distinguished from benign tumors based on various features:

- While malignant tumors damage around healthy tissues and hinder function of normal cells in a correct way, benign tumors do not destroy surrounding tissue.

- Malignant tumors are spread to other tissues. However, benign tumors continue to be in the same area in the body.

- Malignant tumors have a tendency to less differentiate than healthy cells whereas benign tumors are more similar to normal cells in terms of differentiation.

- Malignant tumors proliferate more quickly than benign tumors generally (Ruddon, 1995).

Classification of cancers

Tumors are classified as carcinomas, leukemia, lymphomas and sarcomas by taking into account their embryonic tissue origins. Carcinomas have 80% of cancer incidence and originate from endo/ectodermal tissues. Skin, colon, breast, lung and prostate cancers can be given as an example for carcinomas. Leukemia and lymphomas that form 9% of cancer incidence are hematopoietic cancer cells. The origins of sarcomas that have 1% of cancer incidence are mesodermal connective tissues such as cartilage, fat and bone. Unlike leukemia and lymphoma, carcinoma and sarcoma can be called solid tumors because they are able to create a mass. However, leukemia and lymphoma which are also called liquid tumors grow as single cells (El-Metwally, 2009).

Risk factors

There are external and internal factors that play an important role in contracting cancer (Ruddon, 1995). While endogenous factors refer to individuals' age, immune system, genetic, metabolism, internal mutagens and oxidative stress; exogenous mutagens consist of chemical agents, radiation, free radicals, carcinogenic microorganisms and tumor promoters. These factors usually can be blocked thanks to immune system, DNA repair mechanisms, apoptosis and consuming healthy nutrition. For that reason, malignant tumors occur because of collaboration of internal and external factors (El-Metwally, 2009).

External risk factors of cancer can be separated into three subtitles as physical, chemical and biological. The rays of the sun, ultraviolet rays and ionizing radiation such as X-ray can be examples for physical risk factors of cancer. While various substances such as vinyl chloride, 2-naphthylamine and benzopyrene are some examples for chemical external agents of cancer, hepatitis B and C virus and human papilloma virus are biological factors that may cause cancer (WHO, 2002).

The depletion which is seen on the ozone layer makes the rays of the Sun dangerous for human health. Therefore, exposing to sunlight too much is a risk factor for skin cancer (Rivas, Rojas, Araya, & Calaf, 2015). Furthermore, Dore and Chignol's study (2012) indicates that going to tanning rooms, artificial resources of UV radiation, which have become popular since 1980s not only in Northern counties, but also in the other countries such as Italy and Australia, too often increases the possibility of contracting melanoma or non-melanoma skin cancer.

In addition to environmental and genetic factors, behavioral factors play a role in the development of cancer (Latino-martel et al., 2016). The products that contain tobacco such as cigarette, cigar, pipe and water-pipe tobacco (hookah) have many carcinogenesis. While some of the carcinogenesis exist in tobacco plant, most of them occur as it is burned. The substances that cause cancer disease in use of tobacco are polycyclic aromatic hydrocarbons, tobacco-specific N-nitrosamines, aromatic amines, aldehydes, and certain volatile organic compounds. A lot of people, who use tobacco, become addicted to it because of nicotine. Cigarette smoking especially causes lung cancer. 82% of lung cancer cases are formed by smoking. While number of people who were diagnosed with lung cancer was approximately 313,000, the number of death due to lung cancer was 268,000 in EU in 2012. In addition to use of tobacco, exposure also to tobacco smoke generates lung cancer. Consuming tobacco does not only cause the formation of malignant tumors in lungs, but causes cancer in other organs such as kidney, liver and pancreas as well. Furthermore, various studies show that there may be a relationship between smoking and breast cancer and childhood leukemia (Leon et al., 2015).

Following tobacco consumption, alcohol consumption is observed as the second leading risk factor that causes various chronic diseases and deaths especially in the countries that have high income. The International Agency for Research on Cancer (IARC) Monographs indicates that there is a strong relationship between alcohol consumption and oral cavity, pharynx, larynx, esophagus, liver, colorectal and female breast cancers regardless the amount consumed. The results of the studies conducted show that drinking alcohol increases the possibility of formation of malignant tumors in the organs of upper and lower digestive systems as well as in the

respiratory systems even if people do not smoke. The beverages that include alcohol mostly consist of ethanol and water, and a smaller amount of volatile and non-volatile substances. The most significant substance is ethanol in an alcoholic beverage in terms of cancer risk. In addition, ethanol may start working some existing pro-carcinogens in alcohol. Moreover, the genotoxic metabolite of ethanol plays an important role as a carcinogen (Scoccianti et al., 2015).

Lifestyle habits such as diet is a significant risk factor for cancer. Although it does not only lead to the development of some cancer types, it may affect the developing process of cancer by various ways. There are some studies suggesting that there is a positive correlation between cancer and unhealthy diet. It is reported that consuming fruits and vegetables reduce cancer risk. If they are not eaten in adequate amounts, the possibility of being diagnosed with cancer on upper digestive and respiratory tracks, pharynx and larynx increases. Moreover, the results of various studies specify that there is a negative correlation between the amount of fruit consumed and lung and stomach cancer. In addition to fruits and vegetables, pulses and whole grain foods, which include high fiber, reduce cancer risk. They have a negative effect on colorectal cancer. On the other hand, less consumption of high calorie foods, salt, red and processed meat decrease cancer risk. The conducted studies show that saturated fat increases breast cancer risk. The beverages that include sugar increase glucose and insulin level in the blood and cause diabetes and obesity which are be related to pancreatic cancer. Consuming nutrients often which has high glycemic index is substantially responsible for breast and colorectal cancer risk. There are plenty of studies which indicate that processed and red meat generate to form malignant tumors. Especially nitrite that include nitroso compounds and nitrosylated haem iron

in processed meats causes oxidative DNA damage, and eating them increases stomach and pancreatic cancers risk. Another risk factor of stomach cancer is salt use. It is reported that salt may increase effect of nitrite in terms of cancer risk. Doll and Petro predicted that 35% of deaths due to cancer could be decreases by a well-balanced diet and fighting against obesity (Norat et al., 2015). In EU, half of the people are overweight or obese because their energy consumption is less than their energy intake. This imbalance in energy intake is related to some malignant tumors located in esophagus, colorectum, gallbladder, pancreas, postmenopausal breast, endometrium, ovary, kidney and prostate. Seventeen thousand two hundred and ninety-four people were diagnosed with cancer in 2010 in UK owing to obesity and overweight. It is reported that performing any physical activity reduces the likelihood of obesity and overweight thereby of cancer (Anderson et al., 2015). There are strong evidences on physical activities' decreasing of colon, endometrial and breast cancer risks. It is estimated that 9% of breast cancer cases and 10% of colon cancer cases occur in people who do not perform enough physical activity (Leitzmann et al., 2015).

Symptoms of cancer and current treatment methods

Symptoms of cancer change according to type of cancer and the place in the body where cells divide uncontrollably. To give an example, a mass in the breast and nipple discharge are signs of breast cancer or the pain is a symptom in metastatic breast cancer while extreme fatigue and seizure may be signs of lung and brain cancers respectively (Lalla, Ogale, Achhra, Shah, & Parmar, 2013). No symptoms may be observed in some cancer cases. Pancreatic cancer is one of these cases. The disease cannot be detected as long as it does not reach its advanced stage. Chills,

fatigue, fever, loss of appetite, malaise, night sweats and weight loss may be seen in cancer patients (Moscow & Cowan, 2011).

Like symptoms, treatment depends on cancer type and stage. The stage means tumor size and spread from the start location in the body (Moscow & Cowan, 2011).

Surgery is the first important progress for cancer treatment (Aigner & Stephens, 2011). If cancer cells do not spread, surgery is preferred as a treatment method. However, if cancer spreads, radiotherapy and chemotherapy are used (Moscow & Cowan, 2011).

Radiotherapy is based on utilizing ionizing radiation to kill cancer cells. Thanks to radiotherapy, free radicals and secondary charged particles are made. These made products have an effect on nucleic acids of malignant cells and cause death of the cells. There seem to be connection between cellular deadliness and the number of double stranded DNA breaks which are created in the cell nucleus. Responding of the cancer cells to radiotherapy is related to their ability to fix the treatment damage, populate and oxygenate again. Radiation dosage refers to absorbed energy per unit mass. Radiation can damage healthy cells as well and this situation is the limitation of radiotherapy (Greenhalgh & Symonds, 2014).

While surgery and radiotherapy are used to remove primary tumors in local treatments, chemotherapy is used in case of metastases. If chemotherapy is used to cure cancer, chemotherapy doses should be scheduled. Otherwise, the doses which are delayed or reduced affect the treatment process negatively in the long run. In the

palliative chemotherapy, the doses should be arranged properly to bring cancer symptoms under control and improve life quality of the patients. The aim of chemotherapy is to kill malignant cells while healthy cells are prevented relatively from its adverse effects. Chemotherapeutic drugs are more effective on rapidly dividing cancer cells than on healthy cells. The responding of cancer cells to chemotherapy depends on tumor's histology and the type of drug given (Greenhalgh & Symonds, 2014).

In addition, use of metals, gene therapy, biological therapy, inhibitors and photothermal techniques are new approaches to treat cancer nowadays (Samuel & Carmen, 2010).

Cancer statistics

In the World

Cancer is one of the main health issues in both developed and less developed countries (Siegel, Miller, & Jemal, 2015). There are some reasons that affect the increase of death rate in cancer:

- Number of people who die because of cardiovascular diseases decreases
- There is a relationship between cancer and agedness. Therefore, aging population increases cancer cases.
- The increase in the number of the people who consume tobacco stimulate cancer formation.
- Harmful living habits such as malnutrition, physical inactivity and obesity cause the increase in cancer (WHO, 2002).

Tomatis et al. stated that while there were 6 million new cases and 4 million deaths in cancer in 1970s, this ratio increased to 10 million for new cases and 6 million for mortality in 1990. According to IARC report, the number of people diagnosed with cancer was 12.4 million (6,672,000 in male and 5,779,000 in female) and the number of people who died because of cancer was 7.6 million (4,293,000 in male and 3,300,000 in female) in 2008 (International Agency for Research on Cancer [IARC], 2008). In 2012, there were 12 million people diagnosed with cancer and 8.2 million people who died because of cancer. It is expected that these numbers reach to 22 million for the diagnosis of cancer and 13 million for cancer deaths next 20 years (WHO, 2002.; Torre et al., 2015). WHO predict that the number of people who contract cancer will rise by 50% by 2020 (Knighting et al., 2011).

Although lung and breast cancers are the most common cancer types and cause most deaths among males and females worldwide (1,241,600 new lung cancer cases for men and 1,676,600 new breast cancer cases for women) in both underdeveloped countries and developing countries (751,300 600 new lung cancer cases for men and 882,900 new breast cancer cases for women) alike, prostate cancer is the most common cancer among males (758,700 new cases) in more developed countries. In addition, lung cancer is the most fatal cancer type among females (209,900 death cases) in more developed countries than breast cancer cases in developing countries. While liver, stomach and colorectal are the other cancer types which are seen among men most commonly; these are stomach, cervix uteri and colorectal for women. Moreover, bladder and uterus cancers are the cancer types that are commonly observed among males and females respectively in more developed countries. However, in less developed countries liver cancer is the second and stomach cancer

is the third most commonly seen and cause death among males. It is predicted that cancer cases will continue to increase due to risk factors and changes in world population (Torre et al., 2015).

In Turkey

In 2013, while age standardized cancer rate was 267.9 per one hundred thousand for males, it was 186.5 per one hundred thousand for females and total cancer incidence was 227.2. The number of males and females who developed cancer were 103,070 and 71,233 respectively according to 2013 cancer statistic report (Gültekin et al., 2016).

Although the cancer incidence rate of Turkey was lower than that of the developed countries such as the USA and EU countries, it was higher than world average. Most five common cancer types observed in Turkey were similar to the incidences observed in other countries. While men males were diagnosed with most trachea, bronchi and lung cancer (standardized value by age is 59.3 per one hundred thousand), breast cancer was the most common cancer type among women (standardized value by age is 45.9 per one hundred thousand). When all age groups were evaluated in terms of most common cancer types, the most common cancer types were found to be the respiratory system (21.9%), prostate (12.9%), colorectal (9.1%), bladder (7.8%), stomach (6%), non-Hodgkin lymphoma (2.7%), kidney (2.7%), larynx (2.6%), thyroid (2.4%), brain and nervous system (2.4%) cancer among men in 2013. Also, breast (24.6%), thyroid (11.6%), colorectal (8.3%), trachea, bronchi, lung (5.3%), corpus uteri (5.0%), stomach (3.9%), ovarian (3.7%), non-Hodgkin lymphoma (2.8%), uterine cervix (2.5%), brain and nervous system

(2.4%) cancers were the most commonly diagnosed cancer types among females in 2013 (Gültekin et al., 2016).

Distant metastasis was observed in 52% of lung cancers which was most frequently seen among males. It is estimated that the number of cancer cases attributed to tobacco and tobacco products is 30,779 (Gültekin et al., 2016).

In 2013, one of every four women was diagnosed with breast cancer, the most common cancer type among females. 45% of the women diagnosed with breast cancer were in the 50-69 age range, and 40.5% were in the 25-49 age group. In this year, 17,531 women were diagnosed with breast cancer (Gültekin et al., 2016).

In childhood, while the most common cancer types were leukemia (33.7%), lymphoma (17.0%), central nervous system tumors (16.7%), soft tissue sarcomas (6.6%), neuroblastoma (5.1%), melanoma (5.0%), bone tumors (4.0%), renal tumors (2.6%), germ cell tumors (2.0%) and hepatic tumors (1.5%) among boys in the 0-14 age range; for girls in the same age range, these cancer types were leukemia (33.4%), central nervous system tumors (19.1%), lymphoma (9.1%), soft tissue sarcomas (7.7%), melanoma (6.6%), bone tumors 4.9%), germ cell tumors (4.7%), neuroblastoma (4.3%), renal tumors (3.4%) and hepatic tumors (1.7%) similarly (Gültekin et al., 2016).

According to 2013 cancer statistics report of Turkey, testis cancer (20.1%), brain and nervous system tumors (9.4%), Hodgkin disease (9.0%), non-Hodgkin tumors (7.5%), bone tumors (7.0%) lymphoid leukemia (5.9%), thyroid (5.9%), myeloid leukemia (5.5%), connective, soft tissue cancer (3.9%) and colorectal cancers (3.5%)

were most common cancer types respectively in male young people who were 15-24 years old. In addition, thyroid cancer (28.0%), Hodgkin disease (8.3%), brain, nervous system tumors (7.7%), non-Hodgkin lymphoma (6.5%), ovarian cancer (6.1%), myeloid leukemia (5.6%), breast cancer (4.9%), bone cancer (4.7%), colorectal tumors (4.0%), connective, soft tissue tumors (3.0%) were the most observed cancer type for young females in the same age range (Gültekin et al., 2016).

The importance of education

Education is an important factor in changing people's living habits and in the creation of awareness in cancer cases. It also increases the level of knowledge on cancer risk factors, prevention from it, and the importance of early diagnosis (WHO, 2002).

Public education is one of the significant parts of cancer control programs, and plays a remarkable role in the training of people living healthy lifestyles. Education programs are separated into four parts as increasing level of public's knowledge, avoiding cancer risk factors, learning methods of self-examination and teaching the importance of early diagnosis. Moreover, schools can encourage students to learn about cancer. For instance, a cancer education program was implemented in a school curriculum in Washington DC aimed to increase students' awareness in cancer, gain healthy habits, and to remove misconceptions and negative attitudes toward cancer. A research conducted in Singapore among middle school students indicated that such aims must be arranged according to students' ages (Van Parijs, 1986). Van Parijs suggested that a well-prepared cancer education program applied in schools increased students' cancer awareness and motivated them to make healthy decisions and changed their attitudes of cancer. It was reported that after the launching of

cancer education supported by homework program caused changes in students' and parents' smoking habits.

There are significant evidences showing that education increases people's cancer awareness and change their life habits. To give an example, before receiving of education while 32% of women knew that cervical cancer could be prevented this proportion reached to 56% after they were educated for seven years. In a similar way, the people's smoking awareness reached from 40% to 80% thanks to education given in the last 18 years. According to the results of the survey conducted by American Cancer Society there was a rise in terms of Pap-test awareness among women from 59% to 90% between 1961 and 1970. Moreover, the education increased self-examination awareness for early diagnosis of breast cancer in the USA. As a result of the campaign against smoking launched in Finland, the proportion of young smokers reduced from 32% to 25 % within 5 years (Van Parijs, 1986).

Leuven, Plug and Ronning (2016) explored whether education decreases cancer risk in their study. In accordance with this purpose, the researchers used the compulsory schooling reform that was applied 50 years ago in Norway to get information. After the reform, the period of compulsory education raised from seven years to nine years. Also, the curriculum was standardized. In this study, the participants were observed in their adulthood in terms cancer risk and cancer deaths to compare the results. The results proved that risk of developing lung and prostate cancer decreased among male participants. Moreover, it was stated that the rate of smoking decreased while

prostate cancer increased. The study emphasized that there was a statistically significant negative correlation between education and cancer deaths and risks.

One of five women gets lymphedema after breast cancer treatment and it causes deaths at high rate. It is stated that the breast cancer patients, who are informed about lymphedema, have less degree and duration of lymphedema (Borman, Yasrebi, & Özdemir, 2016). Asuquo and Olajide (2015) aimed to discover whether education had a role on breast cancer awareness in Nigeria. For that reason, they conducted a survey for undergraduate female students. The results indicated that there was a strong relationship between cancer awareness and the students' knowledge about self-examination and risk factors of breast cancer. Moreover, according to the results health education played an important role in reducing breast cancer.

Cancer education at schools

In the World

Health is not the first priority of K-12 schools. The schools focus on having children pass their exams. Therefore, they give priority to the courses testing certain skills, such as reading and mathematics instead of arts, health and physical education. Schools are evaluated in accordance with the scores their pupils receive in the exams. Consequently, health courses are considered less important (Morse, 2013).

Under this title of the chapter, international curricula and the curricula of a few countries were examined in terms of cancer as well:

Personal, social and physical education course of International Baccalaureate Primary Years Programme (IB PYP) defines well-being in three parts: identity, active living and interactions. Active part of the course focuses on internalizing

healthy living habits. Although students recognize the importance of physical activity, avoiding unhealthy food and good hygiene, these terms which are also important in cancer prevention are not associated with it in the curriculum (IBO, 2009). Moreover, there is not any information about biological process of cancer in science course of PYP (IBO, 2008).

Like PYP, though International Baccalaureate Middle Years Programme (IB MYP) focuses on the benefits of physical activity and healthy lifestyle in physical and health education course guide, it does not include any knowledge about cancer (IBO, 2014a). In addition, cancer is not taught in science course of MYP (IBO, 2014b).

In International Baccalaureate Diploma Programme curriculum, firstly the term "cancer" is placed into "Cell Division" under the chapter titled "Cell Biology". In the application and skills part of the topic, students are expected to learn the relationship between cancer incidence and smoking. Moreover, students are informed that many researchers study on the factors that cause cancer and multidisciplinary treatment methods. According to the utilization part of the topic, students are expected to realize that mitotic index is used as a prognostic tool in the diagnosis of the malignant tumor cells to be subjected to chemotherapy. Tobacco industry and consuming tobacco can be discussed by students in this topic. Secondly, in the "Inheritance" topic of "Genetics" unit, radiation and various chemicals are given as cancer risk factors increasing the rate of mutation. Finally, in "Gas Exchange" under the topic of "Human Physiology" unit, risk factors and bad results of lung cancer are taught and discussed (IBO, 2014c).

In AP biology curriculum, cancer is given as an example to teach students that there are internal and external factors that control and manage cell cycle process, signal pathway, gene expression. However, the curriculum does not include any information about symptoms, risk factors or treatment methods of cancer. (AP, 2011).

Cancer is said to be an elective topic of the curriculum for 10-15 years in Germany and other countries. This means that teachers can select the topic which they teach in lessons (Heuckmann & Asshoff, 2014).

While high school students have more course material on cancer, primary and middle school students' textbooks focus more on other diseases mentioned in the Japanese educational system. A curriculum that is based on students' cancer perception has not been developed in Japan (Sugisaki et al., 2014).

In Turkey

There is not any information about cancer biology, risk factors, and prevention methods neither in physical education courses nor in science & technology courses at primary and middle schools in Turkey (MoNE, 2013a; MoNE, 2013b; MoNE, 2013c).

Health course is taken at ninth grade in Turkish schools. Unit 5 of the health course curriculum that is called "Harmful Habits for Health" emphasizes that there is a relationship between cancer and smoking. Also, Unit 7 that is called "Basic Concepts and Principles about Diseases" includes some information about risk factors and

symptoms of cancer. One of the purposes of this unit is to teach students the importance of early diagnosis and ways of prevention. Students can prepare some activities about cancer during the unit (MoNE, 2012).

According to high school biology curriculum in Turkish schools, cancer is taught at tenth grade in the context of mitosis in the unit dedicated to "Reproduction". In addition, in the unit named "From gene to protein", current cancer treatment methods are examined (MoNE, 2013d). However, there is not any information in both chemistry and physics high school curricula about cancer although it is an interdisciplinary topic for science (MoNE, 2013e; MoNE, 2013f).

Eleventh grade biology textbook of MoNE provides a brief information about glucose consumption of cancer cells, and associates the biological process of glucose consumption with treatment methods of cancer in the unit which is called "Energy conversion in living things." The book also states the effects of immune system cells on cancer cells (Kaya & Demirel, n.d.). Besides, 12th grade biology textbook merely states that cancer treatment method is one of the application areas of genetic engineering and biotechnology (Arslan & Ünver, 2015).

Research about students' understanding of cancer

In the World

There are various studies that investigate students' knowledge of cancer, their attitudes, interest, beliefs, understanding, and perceptions of cancer in order to develop or create more effective programs for cancer awareness.

A research study conducted in Germany by Heuckmann and Asshoff (2014) investigated high school students' knowledge of cancer risk factors, interest and attitudes toward cancer. The attitudes toward cancer were examined in terms of cognitive, affective and behavioral dimensions. They conducted a paper-and-pencil questionnaire. Three hundred ninety-six students in the 16-18 age group participated in the study. The results indicated that there was a relationship between the students' interest in cancer, opinions about preventability of cancer, and their volunteering to take action against cancer. Although their ideas about carcinogenic risk factors did not have a direct impact on their behaviors in the prevention from cancer researchers reported that they might have an indirect effect on students' opinions about preventability of cancer.

Kyle et al., (2012) suggested that there were very few studies that explored young people' cancer awareness and knowledge level about it. Their study investigated students' knowledge on cancer risk factors, symptoms, and whether students knew a cancer patient someone who was suffering from cancer. There were 478 students from the 11-18 year old group as participants in the study. The researchers claimed that the students' cancer awareness was low. In addition, the results showed that 50% of the students did not know the cancer types which were the most diagnosed in teenagers and children. Sixty nine percent of the participants thought that there was no relationship between cancer and old age. According to the results, the participants who were in 13-17 age group had higher cancer awareness. Furthermore, the participants who knew a cancer patient were more knowledgeable about cancer. In addition, 74% of the participants stated that they asked for help in three days if they thought that they contracted cancer. The possibility of finding cancer symptoms of

doctor, to be embarrassed, to be scared and not to feel comfortable to talk about cancer were some of the reasons not to ask help from doctors for students. Furthermore, these emotional barriers were more seen among female students. As a result, the researchers claimed that young people had insufficient cancer awareness. According to them, the group that would be given cancer education needed to be determined in order to create cancer awareness among students.

Sugisaki et al. (2014) also aimed to research primary, middle and high school students' cancer perception. Therefore, they conducted a nationwide questionnaire at a single point in time in Japan. The questionnaire included the names of 15 cancer types and the participants were asked whether they heard these cancer types. According to the results, while primary school students most knew lung cancer, middle school and high school students most knew leukemia and breast cancer respectively. In addition, it was observed that female students had better cancer awareness than male students. However, the researchers suggested that approximately 50% of the students did not even know common cancer types and this situation indicated that cancer education was insufficient.

The objective of another study conducted in England (Oakley et al., 1995) was to determine students' knowledge of cancer, the attitudes toward the disease, health understanding, and the behaviors regarding the healthy life of the students in the 9-16 year old age group. The results of the questionnaire conducted revealed that the students were most familiar with the lung cancer, and that they had some information about leukemia, breast, and skin cancers. The participants thought that smoking, pollution and environmental issues were the most detrimental factors causing cancer.

The researchers claimed that the students had a considerable amount of information on lung cancer and smoking. Despite this situation, they did not adopt healthy living habits, being healthy was not the most important issue for them.

Knighting et al. (2010) aimed to explore children's understanding of cancer and behaviors about health by using 'draw and write' technique. One hundred and ninety five children in the 8-11 age group participated in the study. Students were expected to write or draw something about cancer, and healthy or unhealthy stuff or habits. In order to analyze data, techniques of thematic content analysis were used. The acquired results indicated that students had a negative cancer understanding although they did not have any experience on it. The researchers stated that cancer risk factors, diagnosis and treatment methods should be clearly defined for children. Moreover, they suggested that appropriate approaches should be included in health education by taking into account media power on students.

Sherman and Lane (2014) investigated students' knowledge on lung, breast and cervical cancer risk factors in the UK. Data were collected from 62 male and 58 female university students by a questionnaire. According to the results, female students' knowledge about risk factors was higher than that of the male students' for each cancer type. Both female and male students had more knowledge about lung cancer risk factors than other cancer types. Half of the participants did not know that virus can be a risk factor for cervical cancer.

In Turkey

There are very few studies that investigate Turkish high school students' perceptions,

awareness, attitudes, and interests in cancer.

Karayurt et al., (2008) conducted a study in order to determine female high school students' awareness in risk factors of breast cancer and their levels of knowledge regarding self-examination. The number of students who participated in the research was 718 and they filled in the questionnaire consisting of questions on demographic information, breast cancer risk factors, and self-examination in breast cancer. The results indicated that the participants did not have enough knowledge about self-examination. Very few participants applied self-examination tests. Most of them stated that they did not apply self-examination test because they did not know how to apply it. Similarly, the students had very little knowledge on breast cancer risk factors. The most known risk factor among the participants was familial cancer history. The researchers reported that a high amount of awareness should be created among young female students and that they needed to be taught in the importance of early diagnosis.

Another study conducted in Turkey (Şenel & Süslü, 2015) investigated high school students' and teachers' understanding of skin cancer and knowledge of sun protection. Three hundred ninety six students and 139 teachers participated in this study. The questionnaire was conducted in order to obtain data from the participants. According to results, male students were more exposed to sun than female students. Forty eight point two percent of the participants stated that they spread sunscreen on their skin before going out under the sun. This percentage was lower than that of Thailand, Australia, Italy, Brazil and Switzerland. The researchers suggested that mass media should be used to create awareness of skin cancer among the people.

The purpose of Keten, Isık, Guvenc, Ersoy and Celik's research (2015) was to identify high school students' knowledge on oral cancer. One thousand seventy hundred and eleven female and 1,048 male students participated in the study and completed the questionnaire. The results indicated that knowledge level of female and male students were close to each other although male students consumed more tobacco products that are known as a risk factor for oral cancer. It was also revealed that the students' knowledge on oral cancer was not sufficient.

Koç (2015) researched undergraduate students' level of knowledge on and attitude toward human papillomavirus, cervical cancer and HPV vaccines in Turkey. For that reason, a survey study that was based on a questionnaire to acquire data was conducted. The collected data were analyzed by SPSS and the results indicated that 83.2% of students had no idea about early symptoms and 87.0% of the students did not know early diagnosis methods of cervical cancer although they were aware of the importance of early diagnosis to treat the cancer. Ninety four point four percent of the students did not think that the vaccine played an important role in prevention from cervical cancer. Moreover, 90.9% of the students did not know what they could do prevent themselves from getting HPV virus. In addition, 10.0% of the students knew that HPV virus caused cervical cancer. According to the results of the conducted study, even female undergraduate students had low level of knowledge on HPV virus, vaccine and cervical cancer.

Kurtuncu, Akhan, Celik and Alkan (2014) investigated university students' cancer awareness. Data were collected by face to face interview which included the questions about breast, cervix and prostate from two different campuses of the

university: Health sciences campus and social sciences campus. The number of participants was 209. The results showed that there was a statistically significant difference between health sciences students and social sciences students in terms of cancer risk factor awareness and in naming the most common cancer types among male and females. The students who studied health sciences had higher level of knowledge while the students from social sciences campus did not have sufficient knowledge. The students in both campuses did not know about the application of cancer screening.

CHAPTER 3: METHOD

Introduction

This chapter starts with an explanation of the research design of the study. It includes information about the context, instrumentation of the study and the profile of the participants. Finally, method of data collection and analysis are presented in the chapter.

This thesis focuses on the following research questions:

1. What are Turkish high school students' levels of knowledge on cancer risk factors?

2. Is there a difference between female and male students' knowledge on risk factors causing cancer?

3. What are Turkish high school students' attitudes toward cancer?

4. Is there a difference between female and male students in terms of their attitudes towards\ cancer?

5. Which aspects of cancer stimulate the most interest among high school students?

6. Is there a difference between female and male students in terms of their interest in learning about cancer?

7. Is there a relationship among students' knowledge on risk factors leading to cancer and their attitudes and interests toward cancer?

Research design

Although there are many studies that investigate adults' cancer awareness and

attitudes, Karayurt et al., (2008) suggest that there are hardly any studies pertaining to high school students' attitudes toward cancer and their level of knowledge in Turkey.

The aim of the current study is to examine and evaluate high school students' levels of knowledge in cancer risk factors, attitudes toward, and their interests in cancer. For this purpose, this study was designed as a quantitative research where a survey research was utilized. In a quantitative research, the researcher determines a specific issue to find out it, asks certain questions, acquires quantifiable data and analyzes them via statistics. The researcher has to be objective during the quantitative study (Fraenkel & Wallen, 2006).

This research explored high school students' level of knowledge on, attitudes and interests in cancer as a specific issue. The collected data by a survey were analyzed statistically.

Survey research

The main aim of a survey research is to describe features of a population in a particular issue and/or topic. A survey research has some features which distinguish it from other research types:

- Required information is collected from a sample which is estimated to represent target population features in order to determine various characteristics (such as attitudes, interest and/or knowledge) of it.

- Asking questions is determined as the main method of obtaining required information from the participants and participants' answers form the data of the research.

- Required data is obtained from a sample which is occurred according to characteristics of target population (Fraenkel & Wallen, 2006).

About the study

The research design of the current study is based on inferential analyses and a cross sectional survey. As it has been done in this study, the required data are collected from a sample which represents the target population at a single point in time in a cross sectional survey (Fraenkel & Wallen, 2006). In this study; the data were collected from the participants at four different schools by a paper-and-pencil questionnaire, and then analyzed statistically to find out quantitatively high school students' level of knowledge on cancer risk factors and their interest in and attitudes toward cancer. Moreover, female and male students were statistically compared with each other in order to investigate gender differences in level of knowledge about carcinogenic factors, attitudes towards and interest in cancer. Finally, correlational analysis was conducted to explore whether there was a relationship among level of knowledge on, attitudes towards and interest in cancer.

Context

The aim of this study is to investigate high school students' level of knowledge, their attitudes toward as well as their interest in cancer. In line with this purpose, a questionnaire was implemented in four high schools in Ankara and Erzurum between April and May, 2016. The names of the schools which participated in the study were coded as school 1, 2, 3 and 4 (see Table 1).

School 1 in Erzurum is a laboratory school. Students have to pass two-stage high school entrance exam to study at this school. The first stage of the exam is a written exam and consists of Turkish, mathematics, science and technology, English and nonverbal reasoning tests. The second stage includes Turkish and English essay exams, interview and music and art exams. According to the achievement level in the exam, students may have full or partial scholarships. School 2 is a private school in Ankara. Students take the school's own entrance exam to study at this school. According to the score of the entrance exam or TEOG exam (Temel Eğitimden Ortaöğretime Geçiş Sınavı) they may have scholarship. A certain fee has to be paid by the students who have partial scholarship or do not have scholarship to study at this school. Dates of enrolment are determined by the school administration. School 3 is a private, laboratory and international school in Ankara. The students who want to study at this school have to pass high school entrance exam which is conducted by the school. In addition, a certain fee has to be paid to study in School 3. School 4 in Ankara is a private school. According to students' level of achievement in the school and TEOG exam, they can have various scholarships in School 4.

Table 1

The schools at which the questionnaire was implemented

City name	Town	School
Erzurum	Palandöken	School 1
Ankara	Çankaya	School 2
Ankara	Çankaya	School 3
Ankara	Gölbaşı	School 4

Participants

In a survey research, the sample should be selected from the target population after identifying it. However, sometimes selecting a random or systemic non-random

identifying it. However, sometimes selecting a random or systemic non-random sample from the related population can be difficult for researchers. Therefore, in such cases, the researcher can form a convenience sampling from the population. In a convenience sampling, the individuals are available to collect required data for the research (Fraenkel & Wallen, 2006).

In this research, the participants selected from three private schools in Ankara and from a school in Erzurum were 11th and 12th grade high school students. All of the four schools that participated in this study were partnership schools of the Graduate School of Education at Bilkent University. For that reason, they were available to collect data for this study.

The participants from Ankara and Erzurum were not separated from each other during the analyses because no statistically significant difference was found between the participants in Erzurum and Ankara in terms of their level of knowledge on [$t(273)=$ .718, $p=.473$], affective [$t(256)= .961$, $p= .338$] and behavioral dimension [$t(86.246)=$ .586, $p= .260$] of attitudes towards and interest in [$t(230)= -1.139$, $p= .256$] cancer at the 0.05 level.

The total number of the participants was 275. While 56% of them were female, this ratio was 44% for male students. The number of the participants in each school and their percentages are presented in Table 2.

Table 2

The number of the participants in each school

School name	n	%
School 1	46	16.7
School 2	67	24.4
School 3	23	8.4
School 4	139	50.5

n: The number of the participants

Instrumentation

In this study, a paper-and-pencil questionnaire was used in order to describe the students' level of knowledge regarding risk factors of cancer, attitudes toward and their interest in cancer. Heuckmann and Asshoff developed the original questionnaire in 2014 to examine high school students' attitudes toward and interest in cancer in Germany. The questionnaire was translated from English into Turkish and then it was again translated from Turkish into English to check its validity. Moreover, the part of demographic information was added to it for the purpose of this study.

The questionnaire consisted of four parts (see Appendix A):

The first part included the questions about the participants' demographic information. The participants were asked for gender, age, grade, the followed curriculum, their mothers' and fathers' educational backgrounds, the amount of monthly income, anyone who suffers from cancer in their families and the type of cancer in the first part.

The second part consisted of 14-statement dichotomous scale (yes-no) that was about cancer risk factors. The participants were asked whether they saw a relationship between cancer and the given statements and to choose one of "yes" or "no" for each statement in order to describe their knowledge level. They gained one point for each

correct answer. The reliability was analyzed by Cronbach's alpha and determined to be α=.783.

There were 20 items that represented the tripartite model of attitudes (cognitive, affective and behavioral) to describe participants' attitudes toward cancer in the third part of the questionnaire. Four-point Likert scale (1= strongly disagree, 2= disagree, 3= agree, and 4 = strongly agree) was used in this part and the participants were asked to select one of 1, 2, 3 and 4 for each statement. The cognitive dimension of the third part in the questionnaire included five items (α=.367) which were related to ideas about "preventability of cancer." However, due to low Cronbach's alpha value of the cognitive dimension items were not included in the analyses. There were seven items in the affective dimension of the part and the internal consistency which was calculated by Cronbach's alpha was α=.897. These items focused on "negative emotional responses toward cancer". The behavioral dimension items (eight items, α= .837) were divided into three subsections as communication (four items, α= .842), lifestyle choices (two items, α= .803) and social engagements items (two items, α= .610) to examine "proactive behaviors" of the participants toward cancer.

The forth part of the questionnaire consisted of 27 items that included various cancer types, treatment methods and cancer biology to investigate students' interest in cancer. Four-point Likert scale (1= not interesting, 2= rather not interesting, 3= interesting and 4 = very interesting) was used in this part to examine how much the participants were interested in cancer. They were asked to choose one of 1, 2, 3 and 4 for each statement. The internal consistency was calculated by Cronbach's alpha and it was α= .970. Table 3 shows the distribution of the items in the questionnaire.

Table 3

The parts, questions and items of the questionnaire

Parts	Question(s)	Items
Part I (demographic information)	1, 2, 3, 4, 5, 6, 7, 8, 9	-
Part II (level of knowledge on cancer risk factors)	10	a, b, c, d, e, f, g, h, I, j, k, l, m
Part III (attitude toward cancer)	11	Cognitive items: a, b, c, d, e
		Affective items: f, g, h, i, j. k, l
		Behavioral items: m, n, o, p, q, r, s, t
		Communication items: m, n, o, p
		Lifestyle choices items: q, r
		Social engagement items: s,t
Part IV (interest in cancer)	12	a, b, c, d, e, f, g, h, i, j, k, l, m, n, o, p, q, r, s, t, u, v, w, x, y, z, aa.

Method of data collection

The data collection process of the research consisted of three stages:

The first stage includes preparation of the instrument between January and February, 2016. During this process, firstly Heuckmann and Asshoff who were the developer of the original questionnaire were asked for permission to use it (see Appendix B). Then the questionnaire was translated from English to Turkish, and it was back translated into English in order to check the validity of it. In addition, various questions were added to the questionnaire to acquire the participants' demographic information.

In the second stage, the required permission was obtained from MoNE (see Appendix C) to implement the questionnaire and the schools which participated in the study was informed about the permission in March, 2016. Despite the MoNE permission, School

4 asked the researcher to obtain a special permission from the school administration. Therefore, the required permission was obtained in April, 2016 from the administration of School 4 to conduct the questionnaire.

In the third stage, the data collection was completed by administering the questionnaire between April and May, 2016. The questionnaires were sent the principal of School 1 in Erzurum by the research supervisor by e-mail. The participants at School 1 completed the questionnaire in guidance courses and the process was managed by the guidance teacher. The completed questionnaires were sent to the research supervisor by the principal of the school by mail. At School 2, the questionnaires were given to the principal by the research supervisor. The participants filled in it in guidance courses and this process was led by the guidance teacher. The filled questionnaires were received by the researcher from the principal of the School 2. At School 3, the questionnaires were delivered to the secretary of high school. The participants filled in the questionnaires in guidance courses and the questionnaire process was managed by the guidance teacher. The questionnaires were received from the secretary by the researcher. At School 4, the questionnaires were given to the department of biology and the head of the department was informed about the study. The teachers in the department managed the process of implementing the questionnaire. The collected data were received from the department of biology by the researcher. The duration of filling in the questionnaire took approximately 20 minutes.

Method of data analysis

Quantitative data analysis was used for each research question, since this study is a survey research. Statistical Package for Social Sciences (SPSS, v.24.0) was used as software to analyze the collected data in each question.

Firstly, for the items in the second (cancer knowledge level about risk factors), third (attitudes toward cancer) and fourth (interest toward cancer) part of the questionnaire normality analyses were computed. According to the results of the normality analyses, parametric tests were used for each research question.

All items of the questionnaire were analyzed by descriptive statistics to investigate students' cancer knowledge level about risk factors (research question 1), their attitudes (research question 2) and interest toward (research question 5) cancer. As results of descriptive statistics; means, standard deviations, frequencies and percentages of the items were calculated. The mean values of the items in attitude and interest part of the questionnaire gave information about students' tendency. The mean values which were greater than 2.5 showed that the most of the participants tend to agree with the given statement or were interested in it. On the other hand, the mean values which were smaller than 2.5 indicated that the most of the participants disagreed with the statement or were not interested in it.

For the second, fourth and sixth questions, independent sample t test was used to investigate whether there was a difference between female and male students in terms of their cancer knowledge level about cancer risk factors and their attitudes and interest toward cancer. Thus, the male and female participants' mean values of knowledge level, attitudes and interests were compared with each other. While their knowledge level, attitudes and interest were assigned as test variable, gender was assigned as grouping variable.

Correlational analysis was used to investigate the relationship among students' cancer

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knowledge level about risk factors and their attitudes and interest toward cancer (research question 7). The graphs were drawn in order to evaluate linearity and to decide which correlation type must be used according to the linearity. The graphs were linear; therefore, a Pearson product-moment correlation coefficient was computed to analyze the data for the first research question.

CHAPTER 4: RESULTS

Introduction

The findings of the analyzed data which were collected by the questionnaire are presented in this chapter of the thesis. The chapter starts with the demographic information of the participants. Secondly the findings of each research question are given one by one with a related title.

Questionnaire results

The results of the study were obtained by analyzing the questionnaire which consisted of four parts as demographic information, level of knowledge on risk factors causing cancer, attitudes and interests toward cancer. SPSS was used to analyze the collected data. The SPSS results of the study are presented according to the research questions in this chapter by giving a related title for each research question.

Demographic information

Demographic information was obtained from the participants by the first part of the questionnaire. Participants were asked for their gender, age, the implemented curriculum in their schools, parents' educational background, their monthly income, whether they had anyone with cancer in the family or not and if they had, who it was.

Two hundred seventy five students who were in the 16-19 age range completed the questionnaire (N=275 students; 56% female, 44% male). The average age of students was 17.22 years (SD= .761). More than half of the respondents (58%) were 17 years old. While most of the students (77%) were in 11th grade, only 23% of them were in

12th grade. In addition, the number of participants who were following only MoNE curriculum was 82 (30%). Seventy percent of the participants followed IBDP curriculum in addition to MoNE curriculum. Most of the participants' mothers (79.7%) and fathers (88.4%) had Bachelor's degree. Moreover, 29.8% of the participants knew someone who suffered from cancer as their relatives.

Forty six students (16.7%) completed the questionnaire at School 1, where 47.8 percent of the participants were female and 52.2% of them were male. Age average of the participants was 17.11. The number of the participants who were in 11th and 12th grade was 38 (82.6%) and eight (17.4%) respectively at School 1. Also, all participants at School 1 followed IBDP curriculum in addition to MoNE curriculum. Eighty six point nine percent of the participants' mothers and 89.1% of their fathers had Bachelor's degree. Twenty one point seven of the participants at School 1 stated that they knew someone, a relative, who had cancer.

Sixty seven students (24.4%) participated in the questionnaire at School 2, where 59.7 percent of them were female and 40.3% were male. Seventeen point zero nine was the age mean of the participants at School 2. While the percentage of the participants who were in 11th grade was 76.1, the percentage of the 12th grade participants was 23.9. Furthermore, 62.7% of them followed only MoNE curriculum and 35.8% of the followed both IBDP and MoNE curriculum. Most of the respondents' mothers and fathers had Bachelor's degree (82.1% and 91.0% respectively). Thirty eight point eight percent of the participants had a person who
got cancer among their relatives.

The number of the participants at School 3 was 23 (8.4%), where 65.2 percent of the participants were female students and 34.8% of them were male. Also, the age average of the respondents of the questionnaire was 17.78. The percentages of the 11th and 12th grade participants were 56.5 and 43.5 respectively. All of them followed both MoNE and IBDP curricula. Fifty two point one percent of mothers and 82.5% of fathers had Bachelor's degree. Twenty six point one of the respondents stated that there was someone with cancer among the relatives.

One hundred and thirty nine students (50.5%) filled in the questionnaire at School 4. While 54.7% of the participants were female, 44.6% of them were male students. The mean of the respondents' ages was 17.23. Seventy eight point four percent of the participants were in 11th grade and 20.9% of them were in 12th grade. While more than half respondents (70.5%) followed IBDP curriculum in addition to MoNE curriculum, 28.8% of them followed only MoNE curriculum. The percentages of respondents' mothers and fathers who had Bachelor's degree at least were 80.6 and 87.8 respectively. Twenty eight point eight percent of the participants at School 4 stated that they had someone who suffered from cancer among their relatives.

Table 4 below shows the distribution of the participants at each school.

Table 4
The distribution of the participants at each school

	School 1	School 2	School 3	School 4
The total number of the participants	46	67	23	139
The number of the female participants	22	40	15	76
The number of the male participants	24	27	8	62
The age average of the participants	17.11	17.09	17.78	17.23
The number of the 11th grade participants	38	51	13	109
The number of the 12th grade participants	8	16	10	29

Table 4 (cont'd)
The distribution of the participants at each school

	School 1	School 2	School 3	School 4
The number the participants who followed IBDP curriculum in addition to MoNE curriculum	46	24	23	98
The number the participants who followed only MoNE curriculum	0	42	0	40
The number of the participants' mothers who had Bachelor's degree	40	55	12	112
The number of the participants' father who had Bachelor's degree	41	61	19	122
The number of the participants who had someone with cancer among the relatives	10	26	6	40

Research question 1: Students' level of knowledge on risk factors causing cancer

The second part of the survey, which includes 14 items, assessed students' level of knowledge cancer risk factors. The participants were asked to indicate yes or no, if they saw a relationship between statements listed in this section and cancer. Frequencies and response rates (percentages) of the results are presented at Table 5.

Table 5
Cancer knowledge level about risk factors of the participants

	(Yes)	%	(No)	%	N
a*: Going to the solarium often	220	80.9	52	19.1	272
b#: Numerous birthmarks	130	47.8	142	52.2	272

*carcinogenic risk factor
#non-carcinogenic risk factor

Table 5 (cont'd)
Cancer knowledge level about risk factors of the participants

	(Yes)	%	(No)	%	N
c*: Excessively exposed to sunlight	210	76.9	63	23.1	273
d*: Drinking alcohol	182	66.7	91	33.3	273
e*: Smoking, cigarettes, cigars or cigarillo	236	86.1	38	13.9	274
f*: Consuming drugs	188	69.1	84	30.9	272
g*: Radioactive radiation	244	89.1	30	10.9	274
h*: Overweight	108	39.7	164	60.3	272
i*: Ultraviolet radiation	240	87.9	33	12.1	273
j#: Hypertension	71	26.1	201	73.9	272
k*: X-ray radiation	226	82.8	47	17.2	273
l#: Frequent common cold	43	15.7	231	84.3	274
m*: Smoking the hookah	212	77.7	61	22.3	273
n#: Contact with cancer patients	26	9.5	248	90.5	274

*carcinogenic risk factor
#non-carcinogenic risk factor

As Table 5 suggests, most of the participants chose the correct answer for carcinogenic factors. The highest percentage belongs to "radioactive radiation" item with 89.1%. Similarly, 87.9% of the participants could identify "ultraviolet radiation" statement correctly as a carcinogenic factor. However, more than half of the participants (60.3%) think that there is no relationship between being overweight and cancer although it is a carcinogenic factor.

In addition, the most of the participants were successful at identifying non-carcinogenic factors. More than half of them stated that there was no relationship between cancer and "numerous birthmarks," "hypertension," "frequent common cold," "contact with cancer patients."

Research question 2: The difference between female and male students' level of knowledge on risk factors causing cancer

Independent sample *t* test was used in SPSS in order to compare female and male students' level of knowledge on risk factors causing cancer. While Table 6 shows the mean values of each item and the participants' general score in cancer knowledge level Table 7 includes the results of independent samples *t* test.

Table 6
Level of knowledge on cancer risk factors: Gender

	Gender	N	Mean	Std. Deviation
General score	female	153	10.80	2.314
	male	121	10.26	2.713
a. Going to the solarium often	female	152	1.13	0.339
	male	119	1.27	0.445

Table 6 (cont'd)
Level of knowledge on cancer risk factors: Gender

		Gender	N	Mean	Std. Deviation
b.	Numerous birthmarks	female	151	1.46	0.500
		male	120	1.59	0.494
c.	Excessively exposed to sun light	female	152	1.18	0.383
		male	120	1.30	0.460
d.	Drinking alcohol	female	152	1.32	0.469
		male	120	1.35	0.479
e.	Smoking cigarettes, cigars or cigarillo	female	153	1.12	0.323
		male	120	1.17	0.374
f.	Consuming drugs	female	152	1.30	0.461
		male	119	1.32	0.468
g.	Radioactive radiation	female	153	1.09	0.289
		male	120	1.13	0.341
h.	Overweight	female	152	1.64	0.480
		male	119	1.55	0.499
i.	Ultraviolet radiation	female	152	1.09	0.281
		male	120	1.16	0.367
j.	Hypertension	female	152	1.76	0.427
		male	119	1.71	0.454
k.	X-ray radiation	female	152	1.16	0.366
		male	120	1.19	0.395
l.	Frequent common cold	female	153	1.88	0.350
		male	120	1.81	0.395
m.	Smoking the hookah	female	152	1.20	0.416
		male	120	1.27	0.444
n.	Contact with cancer patients	female	153	1.93	0.248
		male	120	1.87	0.341

Table 7
Independent samples *t* test for level of knowledge on risk factors causing cancer:
Gender

	F	Sig.	t	df	p
General Score	5.187	0.024	1.769	236.138	0.078
a. Going to the solarium often	33.741	0.000	-2.790	214.891	*0.006
b. Numerous birthmarks	3.069	0.081	-2.106	269	*0.036
c. Excessively exposed to sun light	22.314	0.000	-2.341	230.615	*0.020
d. Drinking alcohol	0.893	0.346	-0.478	270	0.633
e. Smoking cigarettes, cigars or cigarillo	5.374	0.021	-1.140	235.800	0.256
f. Consuming drugs	0.342	0.559	-0.294	269	0.769
g. Radioactive radiation	4.807	0.029	-1.074	232.943	0.284
h. Overweight	7.092	0.008	1.500	248.857	0.135
i. Ultraviolet radiation	14.038	0.000	-1.799	217.815	0.073
j. Hypertension	3.239	0.073	0.910	269	0.364
k. X-ray radiation	2.114	0.147	-0.730	270	0.466
l. Frequent common cold	6.742	0.010	1.471	239.546	0.142
m. Smoking the hookah	5.934	0.016	-1.314	247.284	0.190
n. Contact with cancer patients	14.896	0.000	1.834	209.756	0.068

*p≤.05 level is significant

The results in Table 6 and 7 indicate that there is no statistically significant difference between female (M= 10.80, SD= 2.314) and male students (M= 10.26, SD= 2.713); t(236.138)= 1.769, p= .078.

Although there is no difference overall between female and male students in terms of their level of knowledge on cancer risk factors, there is a statistically significant difference in some of the items, such as "going to the solarium often" statement (M_{female}= 1.13, SD= .339; M_{male}= 1.17, SD= .445); t(214.891)= -2.790, p= .006. While 86.8% of female participants see a relationship between cancer and the solarium, this percentage is 73.1 for male participants. In addition Table 7 suggests that there is a statistically significant difference between female (M= 1.46, SD= .500) and male students (M= 1.59, SD= .494); t(269)= -2.106, p= .036 for "numerous birthmarks" statement. While 59.2% of male students can see that there is no relationship between cancer and numerous birthmarks, this percentage is 46.4% for the same statement in female students. Finally the results in Table 7 show that there is a statistically significant difference between female (M= 1.18, SD= .383) and male students (M= 1.30, SD= .460); t(230.615)= -2.341, p= .020 for "excessively exposed to sun light" statement. Eighty two point two percent of female students are able to see that there is a relationship between cancer and sun light, whereas 70.0% of male students can see this relationship.

Research question 3: Students' attitudes toward cancer

The participants' attitudes toward cancer were classified as cognitive, affective and behavioral dimension. Because of the low Cronbach's alpha value of the cognitive dimension items (α=.367), these items were not statistically analyzed nor reported.

To investigate students' attitudes toward cancer frequency analyses, SPSS was used. The mean values smaller than 2.5 indicate that the participants reject the statement, whereas the values greater than 2.5 show that the participants agree with the given statements.

Firstly, affective dimension of the participants' attitude toward cancer was analyzed (see Table 8). Then, behavioral dimension of attitudes toward cancer and to its subsections (communication, lifestyle choices and social engagement part) were analyzed (see Table 9).

Table 8
Affective dimension of students' attitudes toward cancer

		SD	D	A	SA	Mean	SD
Affective dimension of attitude						2.7209	.80721
f: Faced with the idea of getting cancer I feel depressed	f	59	67	81	60	2.53	1.070
	%	22.1	25.1	30.3	22.5		
g: Thinking about cancer I have negative thoughts	f	31	62	93	81	2.84	.989
	%	11.6	23.2	34.8	30.3		
h: Thinking about getting cancer makes me feel anxious	f	38	54	98	77	2.80	1.012
	%	14.2	20.2	36.7	28.8		
i: Faced with the idea of getting cancer I feel uncertain	f	49	58	103	57	2.63	1.015
	%	18.4	21.7	38.6	21.3		

Note: f: Frequency SD: Strongly disagree (1) D: Disagree (2) A: Agree (3) SA: Strongly agree (4)
SD: Standard deviation

Table 8 (cont'd)
Affective dimension of students' attitudes toward cancer

		SD	D	A	SA	Mean	SD
j: Thinking about cancer, I	f	39	65	99	67	2.72	.996
feel worried	%	14.4	24.1	36.7	24.8		
k: Thinking about cancer, I	f	38	54	88	90	2.85	1.038
feel sad	%	14.1	20.0	32.6	33.3		
l: Cancer diseases make	f	39	68	80	82	2.76	1.042
me feel scared	%	14.5	25.3	29.7	30.5		

Note: f: Frequency SD: Strongly disagree (1) D: Disagree (2) A: Agree (3) SA: Strongly agree (4)
SD: Standard deviation

As Table 8 suggests, the mean value of the affective dimension of the attitude toward cancer which is 2.7209 indicates that most of the participants agree with the statements in this part of the questionnaire. Furthermore, the participants tend to agree with each statement in this title. That means they have negative emotions when they think about cancer. Item k has the highest mean value (*M*= 2.85). Sixty five point nine percent of the participants feel sad (*n*= 178) when they think about cancer. On the other hand, the lowest mean value belongs to item f (*M*= 2.53). Nevertheless, more than half of the participants (52.8% and *n*= 141) agree with item f which means they feel depressed with the idea of getting cancer. Similarly, more than half of them also agree with item i (59.9% and *n*= 160), l (60.2% and *n*= 162), j (61.5% and *n*= 166), h (65.5% and *n*= 175) and g (65.1% and *n*= 174). They feel uncertain with the idea of getting cancer, scared, worried, anxious and have negative thoughts about cancer.

Table 9 indicates the results of frequency analyses of behavioral dimension of the participants' attitudes toward cancer.

Table 9
Behavioral dimension of attitudes of the participants toward cancer

		SD	D	A	SA	Mean	SD
Behavioral dimension of attitude						2.4679	.67876
Communication part of behavioral dimension of attitude						2.1825	.81198
Lifestyle choices part of behavioral dimension of attitude						2.7948	.90610
Social engagement part of behavioral dimension of attitude						2.7127	.85323
m[*]: The idea of getting cancer motivates me to talk about it with my parents	f	98	90	50	29	2.04	.996
	%	36.7	33.7	18.7	10.9		

Note: f: Frequency SD: Strongly disagree (1) D: Disagree (2) A: Agree (3) SA: Strongly agree (4)
SD: Standard deviation
[*]Communication item of behavioral dimension of attitude
[#]Lifestyle choices item of behavioral dimension of attitude
[~]Social engagement item of behavioral dimension of attitude

Table 9 (cont'd)
Behavioral dimension of attitudes of the participants toward cancer

		SD	D	A	SA	Mean	SD
n[*]: The idea of getting cancer motivates me to gather information about the issue	f	55	78	92	41	2.45	.986
	%	20.7	29.3	34.6	15.4		
o[*]: The idea of getting cancer motivates me to speak with my friends about my anxieties	f	100	100	42	25	1.97	.953
	%	37.5	37.5	15.7	9.4		
p[*]: The idea of getting cancer motivates me to talk with affected persons	f	76	77	81	32	2.26	1.004
	%	28.6	28.9	30.5	12.0		
q[#]: The idea of getting cancer motivates me to live a healthier life	f	28	55	95	90	2.92	.978
	%	10.4	20.5	35.4	33.6		

Note: f: Frequency SD: Strongly disagree (1) D: Disagree (2) A: Agree (3) SA: Strongly agree (4)
SD: Standard deviation
[*]Communication item of behavioral dimension of attitude
[#]Lifestyle choices item of behavioral dimension of attitude
[~]Social engagement item of behavioral dimension of attitude

Table 9 (cont'd)
Behavioral dimension of attitudes of the participants toward cancer

		SD	D	A	SA	Mean	SD
r[#]: The idea of getting cancer motivates me to change my way of life	f	40	74	91	65	2.67	1.001
	%	14.8	27.4	33.7	24.1		
s[~]: The idea of getting cancer motivates me to donate for a person who suffers from cancer	f	42	89	89	48	2.53	9.61
	%	15.7	33.2	33.2	17.9		
t[~]: The idea of getting cancer motivates me to participate for children with cancer	f	40	43	91	96	2.90	1.050
	%	14.8	15.9	33.7	35.6		

Note: f: Frequency SD: Strongly disagree (1) D: Disagree (2) A: Agree (3) SA: Strongly agree (4)
SD: Standard deviation
[*]Communication item of behavioral dimension of attitude
[#]Lifestyle choices item of behavioral dimension of attitude
[~]Social engagement item of behavioral dimension of attitude

As Table 9 shows, the mean value of the behavioral dimension of the attitude is 2.4679 which is smaller than 2.5 and this situation indicates that the most of the participants reject the given statements in behavioral dimension of attitude. According to the results, they do not intent to exhibit proactive behaviors toward cancer overall.

Similarly, most of the students decline the items (item m, n, o and p) in the communication part of the behavioral dimension of the attitude (M= 2.1825). The lowest mean value is 1.97 which belongs to item o in the communication part. It shows that 75% of the participants (n= 200) disagree with "the idea of getting cancer motivates me to speak with my friends about my anxieties" statement. In addition, the mean value of item m, n and p is 2.04, 2.45 and 2.26 respectively. The most of the participants tend to decline these items as well. It shows that the idea of getting cancer does not motivate most of them to talk about it with their parents (70.4% and n= 188), to gather information about it (50% and n= 133) and to talk with the affected persons (57.5% and n= 153).

Although the most of the participants reject the items in the communication part of the behavioral dimension of attitude, they agree with the statements in the lifestyle choices part (M= 2.7948). Also, the mean value of item q and r is 2.92 and 2.67 respectively. This indicates that the idea of getting cancer motivates more than half of the participants for a healthier life (69.0% and n= 185) and to change their lifestyle (57.8% and n= 156).

Like the mean value of the lifestyle choices part, the social engagement part of the behavioral dimension of attitude is greater than 2.5 (M= 2.7127). This situation shows

that more than half of the participants agree with item s and t (M= 2.53 and 2.90). That means the idea of getting cancer motivates most of the participants to donate for somebody with cancer (51.1% and n= 137) and to participate for children with cancer (69.3% and n= 187).

Research question 4: The difference between female and male students in terms of their attitudes toward cancer.

Independent sample t test was conducted to explore the difference between female and male students in terms of their affective dimension of attitude toward cancer. Table 10 includes mean values of affective dimension and each item in it and Table 11 shows the results of independent sample t test for affective dimension of attitude and its items.

Table 10
Affective dimension of students' attitudes toward cancer: Gender

	Gender	N	Mean	Std. Deviation
Affective dimension of attitude	female	145	2.8158	0.82494
	male	112	2.6046	0.77181
f: Faced with the idea of getting cancer I feel depressed	female	151	2.62	1.113
	male	115	2.43	1.009
g: Thinking about cancer I have negative thoughts	female	152	2.83	0.982
	male	114	2.86	1.003
h: Thinking about getting cancer makes me feel anxious	female	151	2.92	1.030
	male	115	2.65	0.974
i: Faced with the idea of getting cancer I feel uncertain	female	151	2.68	1.042
	male	115	2.57	0.983
j: Thinking about cancer, I feel worried	female	153	2.82	0.996
	male	116	2.59	0.987
k: Thinking about cancer, I feel sad	female	153	3.00	1.026
	male	116	2.66	1.030
l: Cancer diseases make me feel scared	female	152	2.95	1.060
	male	116	2.53	0.973

Table 11

Independent samples *t* test for affective dimension of students' attitudes toward cancer: Gender

	F	Sig.	t	df	p
Affective dimension of attitude	1.757	0.186	2.092	255	*0.037
f: Faced with the idea of getting cancer I feel depressed	2.774	0.097	1.434	264	0.153
g: Thinking about cancer I have negative thoughts	0.008	0.931	-0.250	264	0.803
h: Thinking about getting cancer makes me feel anxious	0.072	0.789	2.155	264	*0.032
i: Faced with the idea of getting cancer I feel uncertain	0.513	0.474	0.929	264	0.354
j: Thinking about cancer, I feel worried	0.116	0.734	1.819	267	0.070
k: Thinking about cancer, I feel sad	1.011	0.316	2.658	267	*0.008
l: Cancer diseases make me feel scared	0.407	0.524	3.341	266	*0.001

*p≤.05 level is significant

As Table 11 suggests, there is a statistically significant difference between female and male students in terms of their affective dimension of attitude toward cancer; $t(255)=$ 2.092, p= .037. Female students ($M=2.8158$, $SD=$ .82494) have stronger negative emotions than male students ($M=$ 2.6046, $SD=$ .77181). Furthermore, when the items of affective dimension of attitudes are examined one by one, it is seen that there is a statistically significant difference between female and male student for item h; $t(264)=$ 2.155, $p=$ .032; item k; $t(267)=$ 2.658, $p=$ .008; and item l; $t(266)=$ 3.341, $p=$ .001. Thirty six point four percent of female students ($M=$ 2.92, $SD=$ 1.030) strongly agree with item h (thinking about getting cancer makes me feel anxious). However, this ratio is 19.1% among male students ($M=$ 2.65, $SD=$ .974) for same item. Also, whereas 40.5% of female students ($M=$ 3.00, $SD=$ 1.026) strongly agree with item k (thinking about cancer, I feel sad) this percentage is male 24.1 in male students ($M=$ 2.66, $SD=$ 1.030). In addition, while 40.8 of female students ($M=$ 2.95, $SD=$ 1.060) strongly agree with item l (cancer diseases make me feel scared), only 17.2% of male students ($M=$ 2.53, $SD=$ .973) strongly agree with this statement.

As it was done to investigate the difference between female and male students in terms of their affective dimension of attitudes toward cancer, independent sample t test was conducted to explore the difference between genders in terms of their behavioral dimension of attitude toward cancer. While Table 12 lists mean values for behavioral dimension and its items, Table 13 has the results of independent sample t test for the behavioral dimension.

Table 12
Behavioral dimension of students' attitudes toward cancer: Gender

	Gender	N	Mean	Std. Deviation
Behavioral dimension of attitude	female	149	2.5470	0.69710
	male	111	2.3592	0.64295
Communication part of behavioral dimension of attitude	female	149	2.2164	0.84911
	male	113	2.1283	0.75823
Lifestyle choices part of behavioral dimension of attitude	female	153	2.8529	0.94744
	male	114	2.7193	0.84935
Social engagement part of behavioral dimension of attitude	female	153	2.9183	0.83795
	male	114	2.4430	0.80033
m*: The idea of getting cancer motivates me to talk about it with my parents	female	152	2.03	1.006
	male	114	2.04	0.986
n*: The idea of getting cancer motivates me to gather information about the issue	female	151	2.49	1.032
	male	114	2.38	0.916
o*: The idea of getting cancer motivates me to speak with my friends about my anxieties	female	152	1.99	0.997
	male	114	1.94	0.895

*Communication item of behavioral dimension of attitude
#Lifestyle choices item of behavioral dimension of attitude
˜Social engagement item of behavioral dimension of attitude

Table 12 (cont'd)
Behavioral dimension of students' attitudes toward cancer: Gender

	Gender	N	Mean	Std. Deviation
p*: The idea of getting cancer motivates me to talk with affected persons	female	151	2.32	1.049
	male	114	2.17	0.940
q#: The idea of getting cancer motivates me to live a healthier life	female	153	2.95	1.012
	male	114	2.89	0.935
r#: The idea of getting cancer motivates me to change my way of life	female	153	2.76	1.007
	male	116	2.55	0.990
s~: The idea of getting cancer motivates me to donate for a person who suffers from cancer	female	153	2.71	0.978
	male	114	2.29	0.890
t~: The idea of getting cancer motivates me to participate for children with cancer	female	153	3.12	1.009
	male	116	2.62	1.027

*Communication item of behavioral dimension of attitude
#Lifestyle choices item of behavioral dimension of attitude
~Social engagement item of behavioral dimension of attitude

Table 13
Independent samples *t* test for behavioral dimension of students' attitudes toward cancer: Gender

	F	Sig.	t	df	p
Behavioral dimension of attitude	2.018	0.157	2.220	258	[*]0.027
Communication part of behavioral dimension of attitude	2.154	0.143	0.871	260	0.385
Lifestyle choices part of behavioral dimension of attitude	2.423	0.121	1.191	265	0.235
Social engagement part of behavioral dimension of attitude	0.622	0.431	4.673	265	[*]0.000
m[*]: The idea of getting cancer motivates me to talk about it with my parents	0.128	0.721	-0.018	264	0.986
n[*]: The idea of getting cancer motivates me to gather information about the issue	3.506	0.062	0.925	263	0.356

[*]p≤.05 level is significant
[*]Communication item of behavioral dimension of attitude
[#]Lifestyle choices item of behavioral dimension of attitude
[~]Social engagement item of behavioral dimension of attitude

Table 13 (cont'd)
Independent samples *t* test for behavioral dimension of students' attitudes toward cancer: Gender

			t	df	p
	F	Sig.			
o[*]: The idea of getting cancer motivates me to speak with my friends about my anxieties	1.432	0.232	0.408	264	0.684
p[*]: The idea of getting cancer motivates me to talk with affected persons	3.714	0.055	1.267	263	0.206
q[#]: The idea of getting cancer motivates me to live a healthier life	1.530	0.217	0.437	265	0.662
r[#]: The idea of getting cancer motivates me to change my way of life	0.001	0.969	1.678	267	0.095
s[~]: The idea of getting cancer motivates me to donate for a person who suffers from cancer	2.008	0.158	3.632	265	[*]0.000
t[~]: The idea of getting cancer motivates me to participate for children with cancer	1.004	0.317	4.023	267	[*]0.000

[*]$p \leq .05$ level is significant
[*]Communication item of behavioral dimension of attitude
[#]Lifestyle choices item of behavioral dimension of attitude
[~]Social engagement item of behavioral dimension of attitude

Like in affective dimension of attitude, Table 13 shows that there is a statistically significant difference between female (*M*= 2.5470, *SD*= .69710) and male students (*M*= 2.3592, *SD*= .64295) in terms of their behavioral dimension of attitude toward cancer; $t(258)$= 2.220, *p*= .027. Moreover, if the subsections of behavioral dimension are examined separately, the results show that there is a significant difference between female (*M*= 2.9183, *SD*= .83795) and male students (*M*= 2.4430, *SD*= .80033) in terms of social engagement part of behavioral dimension as well; $t(265)$= 4.763, *p*=. 000. According to the results, female students tend to exhibit more proactive behavior toward cancer than male students. However, there is no statistically significant difference between female and male students in their communication and lifestyle choices part of behavioral dimension (see Table 13).

Research Question 5: Students' interest in learning about cancer

Students' interests toward cancer were explored by using third part of the questionnaire. The participants were asked to choose either one of these; "not interesting", "rather not interesting", "interesting" and "very interesting" for given statements. In order to explore the aspect of cancer which stimulates most students' interest descriptive analyses were conducted.

Table 14 lists the mean values of the students' interest in cancer. While the mean values greater than 2.5 show that most of the participants are interested in the item, the means smaller than 2.5 indicate that more than half of the participants are not interested in the statement.

Table 14
Students' interest in learning about cancer

			NI	RNI	I	VI	Mean	SD
a.	human biology in general	f	42	52	95	79	2.79	1.037
		%	15.7	19.4	35.4	29.5		
b.	cancer in general	f	45	90	88	44	2.49	.959
		%	16.9	33.7	33.0	16.5		
c.	lung cancer	f	85	97	46	37	2.13	1.019
		%	32.21	36.6	17.4	14.0		
d.	colorectal cancer	f	69	77	73	48	2.37	1.056
		%	25.8	28.8	27.3	18.0		
e.	prostate cancer	f	89	83	56	39	2.17	1.050
		%	33.3	31.1	21.0	14.6		
f.	stomach cancer	f	74	93	60	35	2.21	1.002
		%	28.2	35.5	22.9	13.4		
g.	liver cancer	f	78	89	58	43	2.25	1.045
		%	29.1	33.2	21.6	16.0		
h.	kidney cancer	f	83	90	55	37	2.17	1.026
		%	31.3	34.0	20.8	14.0		
i.	cancer of the oral cavity and pharynx	f	83	85	59	40	2.21	1.045
		%	31.1	31.8	22.1	15.0		
j.	oesophageal cancer	f	86	95	52	34	2.13	1.007
		%	32.2	35.6	19.5	12.7		
k.	leukemia (blood cancer)	f	58	68	83	57	2.52	1.058
		%	21.8	25.6	31.2	21.4		
l.	bladder cancer	f	91	93	47	35	2.10	1.020
		%	34.2	35.0	17.7	13.2		

Note: F: Frequency NI: Not interesting (1) RNI: Rather not interesting (2) I: Interesting (3) VI: Very interesting (4)

Table 14 (cont'd)
Students' interest in learning about cancer

		NI	RNI	I	VI	Mean	SD
m. skin cancer	f	63	74	75	54	2.45	1.064
	%	23.7	27.8	28.2	20.3		
n. laryngeal cancer	f	74	94	49	49	2.27	1.062
	%	27.8	35.3	18.4	18.4		
o. breast cancer	f	75	62	75	54	2.41	1.103
	%	28.2	23.3	28.2	20.3		
p. gallbladder cancer	f	85	98	41	38	2.12	1.025
	%	32.4	37.4	15.6	14.5		
q. cervical cancer	f	84	73	65	42	2.25	1.070
	%	31.8	27.7	24.6	15.9		
r. testicular cancer	f	82	89	57	38	2.19	1.030
	%	30.8	33.5	21.4	14.3		
s. brain tumors	f	63	43	80	80	2.67	1.141
	%	23.7	16.2	30.1	30.1		
t. symptoms of cancer in general	f	56	64	81	65	2.58	1.076
	%	21.1	24.1	30.5	24.4		
u. cancer genesis	f	48	60	83	75	2.70	1.068
	%	18.0	22.6	31.2	28.2		
v. types of cancer therapy in general	f	46	60	83	75	2.71	1.062
	%	17.4	22.7	31.4	28.4		
w. chemotherapy	f	55	67	77	67	2.59	1.079
	%	20.7	25.2	28.9	25.2		
x. radiation therapy	f	59	76	72	60	2.50	1.070
	%	22.1	28.5	27.0	22.5		

Note: F: Frequency NI: Not interesting (1) RNI: Rather not interesting (2) I: Interesting (3) VI: Very interesting (4)

Table 14 (cont'd)
Students' interest in learning about cancer

		NI	RNI	I	VI	Mean	SD
y. tumor removal by surgery	f	53	58	75	80	2.68	1.105
	%	19.9	21.8	28.2	30.1		
z. alternative types of cancer therapy	f	63	57	74	72	2.58	1.124
	%	23.7	21.4	27.8	27.1		
aa. history of cancer medicine	f	91	73	49	52	2.23	1.124
	%	34.3	27.5	18.5	19.6		

Note: F: Frequency NI: Not interesting (1) RNI: Rather not interesting (2) I: Interesting (3) VI: Very interesting (4)

According to the results in Table 14, the highest mean value belongs to item a (human biology in general) in the interest part of the questionnaire ($M= 2.79$, $SD= 1.037$). Sixty four point nine percent of the participants ($n= 174$) are interested in this item. The second item which stimulates most students' interest is item v ($M= 2.71$, $SD= 1.062$). Fifty nine point eight percent of them ($n= 158$) think that "types of cancer therapy in general" is interesting and very interesting. On the other hand, the lowest mean value belongs to item l ($M= 2.10$, $SD= 1.020$). Sixty nine point two percent of the participants ($n= 184$) think that bladder cancer is not interesting and rather not interesting. Furthermore, the second lowest mean value belongs to gallbladder cancer with 2.12. Sixty nine point eight percent of the participants are not interested in gallbladder cancer.

Research question 6: The difference between female and male students in terms of their interest in learning about cancer

In order to determine whether students' interests were gender specific independent sample *t* test was conducted. Table 15 shows the mean values of overall interests of

the participants and each item, whereas Table 16 lists the results of independent sample

t test.

Table 15
Students' interest in cancer: Gender

	Gender	N	Mean	Std. Deviation
Interest overall	female	132	2.4245	0.77965
	male	99	2.3621	0.82744
a. human biology in general	female	152	2.83	1.060
	male	115	2.74	1.009
b. cancer in general	female	151	2.60	0.932
	male	115	2.36	0.984
c. lung cancer	female	152	2.18	1.011
	male	112	2.08	1.032
d. colorectal cancer	female	152	2.41	1.038
	male	114	2.32	1.085
e. prostate cancer	female	152	2.05	1.002
	male	114	2.33	1.094
f. stomach cancer	female	147	2.21	1.015
	male	114	2.22	0.993
g. liver cancer	female	152	2.21	1.046
	male	115	2.30	1.051
h. kidney cancer	female	150	2.15	1.013
	male	114	2.20	1.049
i. cancer of the oral cavity and pharynx	female	152	2.19	1.028
	male	114	2.24	1.075
j. esophageal cancer	female	152	2.14	0.997
	male	114	2.11	1.025
k. leukemia (blood cancer)	female	151	2.58	1.067
	male	114	2.44	1.039
l. bladder cancer	female	152	2.13	1.038
	male	113	2.07	0.997

Table 15 (cont'd)
Students' interest in cancer: Gender

	Gender	N	Mean	Std. Deviation
m. skin cancer	female	152	2.56	1.059
	male	113	2.29	1.050
n. laryngeal cancer	female	152	2.24	1.036
	male	113	2.32	1.104
o. breast cancer	female	151	2.58	1.110
	male	114	2.18	1.058
p. gallbladder cancer	female	149	2.11	1.010
	male	112	2.13	1.053
q. cervical cancer	female	150	2.32	1.113
	male	113	2.14	1.008
r. testicular cancer	female	151	2.11	1.043
	male	114	2.31	1.006
s. brain tumors	female	152	2.70	1.150
	male	113	2.60	1.130
t. symptoms of cancer in general	female	151	2.65	1.127
	male	114	2.49	1.007
u. cancer genesis	female	152	2.73	1.067
	male	113	2.65	1.077
v. types of cancer therapy in general	female	150	2.71	1.077
	male	113	2.70	1.051
w. chemotherapy	female	151	2.63	1.093
	male	114	2.53	1.066
x. radiation therapy	female	152	2.52	1.079
	male	114	2.46	1.066
y. tumor removal by surgery	female	151	2.73	1.077
	male	114	2.63	1.146
z. alternative types of cancer therapy	female	152	2.64	1.106
	male	113	2.50	1.150
aa. history of cancer medicine	female	151	2.28	1.120
	male	113	2.19	1.130

Table 16
Independent samples *t* test for students' interest in cancer: Gender

		F	Sig.	t	df	p
Interest overall		0.412	0.522	0.586	229	0.558
a.	human biology in general	0.016	0.900	0.700	265	0.485
b.	cancer in general	0.573	0.450	2.026	264	*0.044
c.	lung cancer	0.008	0.930	0.766	262	0.444
d.	colorectal cancer	0.420	0.517	0.636	264	0.526
e.	prostate cancer	6.374	0.012	-2.146	231.318	*0.033
f.	stomach cancer	0.019	0.890	-0.067	259	0.947
g.	liver cancer	0.188	0.665	-0.657	265	0.512
h.	kidney cancer	0.356	0.551	-0.431	262	0.667
i.	cancer of the oral cavity and pharynx	0.786	0.376	-0.355	264	0.723
j.	esophageal cancer	0.095	0.758	0.263	264	0.793
k.	leukemia (blood cancer)	0.161	0.688	1.051	263	0.294
l.	bladder cancer	0.138	0.711	0.427	263	0.669
m.	skin cancer	0.074	0.785	2.038	263	*0.043
n.	laryngeal cancer	2.177	0.141	-0.568	263	0.571

*p≤.05 level is significant

Table 16 (cont'd)
Independent samples *t* test for students' interest in cancer: Gender

		F	Sig.	t	df	p
o.	breast cancer	1.409	0.236	2.968	263	*0.003
p.	gallbladder cancer	0.766	0.382	-0.154	259	0.878
q.	cervical cancer	3.907	0.049	1.358	252.300	0.176
r.	testicular cancer	0.084	0.772	-1.526	263	0.128
s.	brain tumors	0.089	0.766	0.721	263	0.472
t.	symptoms of cancer in general	3.276	0.071	1.181	263	0.239
u.	cancer genesis	0.088	0.767	0.633	263	0.527
v.	types of cancer therapy in general	0.328	0.567	0.107	261	0.915
w.	chemotherapy	0.182	0.670	0.766	263	0.444
x.	radiation therapy	0.066	0.797	0.412	264	0.681
y.	tumor removal by surgery	2.061	0.152	0.705	263	0.481
z.	alternative types of cancer therapy	0.837	0.361	1.004	263	0.316
aa.	history of cancer medicine	0.046	0.831	0.660	262	0.510

*p≤.05 level is significant

As shown in Table 16, there is no statistically significant difference between female

(*M*= 2.4225, *SD*= .77965) and male students (*M*= 2.3621, *SD*= .82744); *t*(229)= .586,

p= .558 in terms of their interest in cancer when all of the items are computed together. However, if each item is analyzed separately it is seen that there is a statistically significant difference between female and male students' interest in some items. For example, female students (*M*= 2.60, *SD*= .932) are more interested in "cancer in general" than male students (*M*= 2.36, *SD*= .984); *t*(264)= 2.026, *p*= .044. Similarly, while 52% of female participants (*M*= 2.56, *SD*= 1.059) are interested in skin cancer this ratio is 43.3% in male students (*M*= 2.29, *SD*= 1.050). This indicates that females are more interested in skin cancer; *t*(263)= 2.038, *p*= .043. Female students (*M*= 2.58, *SD*= 1.110) are more interested in breast cancer as well than male students (*M*= 2.18, *SD*= 1.058); *t*(263)= 2.968, *p*= .003. In contrast with "cancer in general", "skin cancer" and "breast cancer"; male participants (*M*= 2.33, *SD*= 1.094) are more interested in prostate cancer than female students (*M*= 2.05, *SD*= 1.002); *t*(231.318)= -2.146, *p*= .033.

Research question 7: The relationship among students' level of knowledge on cancer risk factors, their attitudes toward cancer in terms of affective and behavioral dimension and interests in cancer.

In order to investigate whether there was a relationship among students' level of knowledge on cancer risk factors, their attitudes toward cancer and interest in cancer, a Pearson product-moment correlation coefficient was computed (see Table 17).

Table 17

The relationship among cancer knowledge level, attitudes, behaviors and interest toward cancer

		CKL	AD	BD	BD-CP	BD-LC	BD-SE	I
CKL	Pearson Correlation	1	0.038	0.018	-0.067	0.110	0.070	0.119
	Sig. (2-tailed)		0.541	0.771	0.278	0.071	0.252	0.071
	N	275	258	261	263	268	268	232
AD	Pearson Correlation	0.038	1	.298**	.244**	.309**	.145*	0.012
	Sig. (2-tailed)	0.541		0.000	0.000	0.000	0.020	0.865
	N	258	258	250	252	256	257	221
BD	Pearson Correlation	0.018	.298**	1	.874**	.747**	.722**	0.099
	Sig. (2-tailed)	0.771	0.000		0.000	0.000	0.000	0.140
	N	261	250	261	261	261	261	224

**. Correlation is significant at the 0.01 level (2-tailed).

*. Correlation is significant at the 0.05 level (2-tailed).

CKL: Cancer knowledge level about risk factors
AD: Affective dimension of attitude
BD: Behavioral dimension of attitude
BD-CP: Communication part of behavioral dimension of attitude
BD-LC: Lifestyle choices part of behavioral dimension of attitude
BD-SE: Social engagement part of behavioral dimension of attitude
I: Interest in learning about cancer

Table 17 (cont'd)
The relationship among cancer knowledge level, attitudes, behaviors and interest toward cancer

		CKL	AD	BD	BD-CP	BD-LC	BD-SE	I
BD-CP	Pearson Correlation	-0.067	.244[**]	.874[**]	1	.437[**]	.408[**]	0.104
	Sig. (2-tailed)	0.278	0.000	0.000		0.000	0.000	0.119
	N	263	252	261	263	261	263	226
BD-LC	Pearson Correlation	0.110	.309[**]	.747[**]	.437[**]	1	.474[**]	0.016
	Sig. (2-tailed)	0.071	0.000	0.000	0.000		0.000	0.813
	N	268	256	261	261	268	266	230
BD-SE	Pearson Correlation	0.070	.145[*]	.722[**]	.408[**]	.474[**]	1	0.068
	Sig. (2-tailed)	0.252	0.020	0.000	0.000	0.000		0.305
	N	268	257	261	263	266	268	230

**. Correlation is significant at the 0.01 level (2-tailed).

*. Correlation is significant at the 0.05 level (2-tailed).

CKL: Cancer knowledge level about risk factors
AD: Affective dimension of attitude
BD: Behavioral dimension of attitude
BD-CP: Communication part of behavioral dimension of attitude
BD-LC: Lifestyle choices part of behavioral dimension of attitude
BD-SE: Social engagement part of behavioral dimension of attitude
I: Interest in learning about cancer

Table 17 (cont'd)

The relationship among cancer knowledge level, attitudes, behaviors and interest toward cancer

		CKL	AD	BD	BD-CP	BD-LC	BD-SE	I
I	Pearson Correlation	0.119	0.012	0.099	0.104	0.016	0.068	1
	Sig. (2-tailed)	0.071	0.865	0.140	0.119	0.813	0.305	
	N	232	221	224	226	230	230	232

**. Correlation is significant at the 0.01 level (2-tailed).

*. Correlation is significant at the 0.05 level (2-tailed).

CKL: Cancer knowledge level about risk factors

AD: Affective dimension of attitude

BD: Behavioral dimension of attitude

BD-CP: Communication part of behavioral dimension of attitude

BD-LC: Lifestyle choices part of behavioral dimension of attitude

BD-SE: Social engagement part of behavioral dimension of attitude

I: Interest in learning about cancer

The results in Table 17 show that there is no correlation between the students' level of knowledge on risk factors causing cancer and their affective (r= .038, n= 258, p=.541), and behavioral (r= .018, n= 261, p= .771) dimension of attitude toward cancer at the 0.05 level. When the parts of behavioral dimension of attitudes are examined separately it is seen that there is no relationship between cancer knowledge level and communication (r= -.067, n= 263, p= .278), lifestyle choices (r= .110, n= 268, p= .071), social engagement (r= .070, n= 268, p= .252) part at the 0.05 level. Moreover Table 17 suggests that no correlation is found between the participants' level of knowledge on cancer risk factors and their interest in cancer (r= .119, n= 232, p= .071). In addition, Table 17 indicates that there is no correlation between students' interest in cancer and their affective (r= .012, n= 221, p= .865) and behavioral dimension (r= .099, n= 224, p= .140) of attitude toward cancer.

On the other hand, according to the results, there is a statistically significant correlation between affective and behavioral dimension of attitude at the .01 level (r= .298, n= 250, p= .000). It shows that as the level of their agreement with the statements which explore their negative emotions increase, they tend to exhibit more cancer-protecting behavior. Furthermore, as shown in Table 17, the parts of the behavioral dimension are strongly correlated with each other.

CHAPTER 5: DISCUSSION

Introduction

This chapter presents the discussion about general findings of the research. Firstly, the overview of the study is given. The chapter continues with the major findings of the research with discussion. Then the implications for practice and further researches take part. Finally, the limitations of the study are presented.

Overview of the study

This study investigated high school students' level of knowledge on cancer risk factors, attitudes in affective and behavioral dimension and interest toward cancer. The required data were collected via questionnaire, analyzed by SPSS and the results of the analyses were given in Chapter 4. The results indicated that most of the participants were successful at identifying carcinogenic risk factors except overweight and all non-carcinogenic risk factors. Also, no statistically significant gender difference was found in terms of the participants' cancer knowledge level about risk factors overall. According to the results, most of the participants had negative emotional thoughts for cancer. On the other hand, more than half of the participants did not agree with the statements in the communication part of the behavioral dimension of attitude. It means that the idea of getting cancer did not motivate them to talk with someone or acquire more information about cancer. On the contrary, most of the participants agree with the statements in lifestyle choices and social engagement part of behavioral dimension of attitude. It indicated that the idea of getting cancer motivated them to take precaution against cancer and help the people with cancer. Besides, the results showed that female students had more

negative emotions for cancer than males. Similarly, according to the results the idea of getting cancer more motivated female participants to live healthier and help cancer patients. In addition, most of the participants were not interested in the items in interest part of the questionnaire overall. Also, no gender differences were found in the interest part. Although no correlation was found among students' cancer knowledge level about risk factors and their attitudes toward and interest in cancer, there was a statistically significant correlation between affective and each part of behavioral dimension of attitude. Each part of behavioral dimension positively correlated among themselves.

The following section presents the discussion of the major findings which consist of eight subtitles:

1. Students' level of knowledge on risk factors causing cancer

2. Gender differences in students' level of knowledge on risk factors causing cancer

3. Students' attitudes in affective and behavioral dimension toward cancer

4. Gender differences in attitudes toward cancer

5. Students' interest in learning about cancer

6. Gender differences in interest in learning about cancer

7. The relationship among students' level of knowledge on risk factors causing cancer, attitudes toward and interest in cancer

The major findings

Students' cancer knowledge level about risk factors

According to the results, most of the participants were successful at identifying carcinogenic risk factors. More than 80% of the participants were able to see that there

was a relationship between cancer and "going to the solarium often", "smoking", "radioactive", "ultraviolet" and "x-ray radiation" (see Table 5). The reason for this high ratio may be television and media, because Oakley et al. (1995) reported that 105 out of 226 participants in their study stated that they got information about cancer from television and media. Furthermore, another research (Karayurt et al., 2008) which explored high school students' knowledge level about breast cancer risk factors suggested that 48.6% of the participants stated that media was the main source to acquire information about breast cancer. These findings of the studies indicate that television and media could be very effective to create awareness and educate young people about cancer risk factors, symptoms of it and the ways of protection against cancer. On the other hand, although there are various studies which states that there is a positive correlation between cancer and being overweight (Anderson et al., 2015), 60% of the participants stated that there was no relationship between them. According to Karayurt et al., (2008) high school students had insufficient knowledge about the relationship between breast cancer and obesity. The reason of this situation may be not having any information about the relationship between cancer and overweight in Turkish high school curricula. Although health course curriculum which is taken at ninth grade includes the importance of a balanced diet, the term of overweight and the factors which cause overweight in Unit 3 that is called "Development and Protection of Health", it does not associate overweight with cancer and not emphasize that it is one of the carcinogenic factors (MoNE, 2012). Similarly, Turkish high school biology curriculum (2013d) has an objective about teaching the importance of a balanced diet and the relationship between obesity and diabetes and insulin resistant in ninth grade, but it does not also associate obesity with cancer.

Like in carcinogenic factors, most of the participants were successful at identifying non-carcinogenic factor as well. However, the percentages of the participants who chose "yes" and "no" for "numerous birthmarks" item were quite close to each other. Although, more than half of the participants (52.2%) were able to identify the item as a non-carcinogenic factor, 47.8% of them thought that it was enough a risk factor for developing cancer. This uncertainty among the participants may be related to no information about symptoms of skin cancer in both biology and health course curricula in Turkey (MoNE, 2012; MoNE, 2013d).

Heuckmann and Asshoff's research (2014) have similar results with the current study. Their results also indicated that most of the participants could identify carcinogenic factors except overweight like the participants in this study. Only 18.7% of the participants stated that they saw a relationship between overweight and cancer in Heuckmann and Asshoff's study. This percentage is too low compared to the current study. In addition, they could correctly identify non-carcinogenic factors as well.

In another study (Oakley et al., 1995), the participants were asked to write carcinogenic risk factors that they knew. Most of them wrote down smoking and sunburn as major risk factors for cancer. Smoking and sunlight were identified correctly as cancer risk factors by approximately 80% of the participants in the current study as well. Similarly, Knighting et al. (2010) aimed to investigate children's understanding of cancer by asking them to draw and write anything about cancer. Smoking and sun were the most drawn or written risk factors for cancer by the participants.

Although the studies (Heuckmann & Asshoff, 2014; Oakley et al.1995) and the current research suggest that students have high level of knowledge on some carcinogenic

factors, there are various studies which show that young people have low cancer awareness in terms of symptoms and common cancer types. Kyle et al., (2012) reported that half of the participants in their research did not know most common cancer types among teenagers and children. Moreover, 'lump or swelling' was the most known symptom of cancer among teenagers, 26.2% of them did not know any symptom of cancer and they were not knowledgeable about other symptoms of cancer. In addition, half of the participants did not know common cancer types which were diagnosed in teenagers and children and 68.5% of the participants thought that there was no relationship between age and cancer.

Another study conducted in Japan (Sugisaki et al., 2014) had similar results with Kyle et al. (2012). The researchers suggested that cancer education was not sufficient in Japan since most of the students were not able to recognize even most common cancer types. Similarly, the current study indicated that cancer education needed to be improved to more emphasize cancer risk factors and eliminate students' uncertainty about non-carcinogenic factors.

Gender differences in students' level of knowledge on cancer risk factors

The differences between females and male students' level of knowledge on cancer risk factors were investigated in the study. According to the result of independent sample t test it was determined that there was no statistically significant difference between females and males in terms of cancer knowledge level about risk factors in general. Contrary to the findings of the current research, Kyle et al. (2012) reported that the percentage of male students who said that they did not have any information about cancer symptoms was higher than female students' percentage. Furthermore, the study

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suggested that the percentage of males who said that they did not know the most common cancer types among children and women was higher than females' percentage.

Although there was no statistically significant difference between genders in terms of cancer knowledge level about risk factors in general, when each item was explored separately, the results of the current research showed that females were more successful at identifying "going to the solarium often" and "excessively exposed to sun light" as cancer risk factors than males. The reason of this result may be related to the lack of knowledge about skin cancer risk factors in male students. In the literature, there are various studies which report that males more expose to sunlight and less use sunscreen than females (Tempark et al., 2012). On the other hand, male students were more successful at identifying correctly "numerous birthmarks" as a non-carcinogenic factor.

Students' attitudes in affective and behavioral dimension toward cancer

One of the aims of the research was to investigate high school students' attitudes in affective and behavioral dimension toward cancer.

The items in the affective dimension of attitude of the questionnaire represented negative emotional responses. The results indicated that most of the participants agreed with all items in affective dimension of attitude and it means more than half of them had negative emotions when they thought about cancer and faced with the idea of getting cancer (see Table 8). The reason of this negative attitude toward cancer may be related to lack of knowledge of the participants about cancer treatment methods and

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the effect of adopting a healthy lifestyle on cancer. Although current cancer treatment methods are examined in the unit which is called "From Gene to Protein" in twelfth grade biology course (MoNE, 2013d) and the importance of healthy living habits in the protection against diseases in both biology and health courses at high school (MoNE, 2012; MoNE, 2013d), the results of the study indicates that these are not sufficient to remove students' negative emotions about cancer.

In the literature, there are some studies which have similar findings with the current research. The results of Heuckmann and Asshoff's study (2014) showed that most of the participants had negative emotions for cancer. In addition, Oakley et al. (1995) asked the participants in their study a question which was about health and worries. While only 36 out of 226 participants stated that they did not worry, the rest said that they worried rarely, sometimes or often about their health. Also, 42% of the participants stated that cancer was one of the most common causes of death for adults. Similarly, Knighting et al. (2010) suggested that children thought that cancer was relevant to death and they had a negative perception about cancer. Furthermore, Kyle et al. (2012) reported that the students had some emotional barriers which hinder them to go to the doctor such as worrying for the possibility of diagnosed with cancer, being too scared and embarrassed.

In light of these findings of the studies, teachers may eliminate students' existing negative emotions and beliefs about cancer and investigate the reasons of these negative thoughts. Thus, students will believe more about the controllability of cancer and take action against it.

Another aim of the current study was to investigate high school students' behavioral dimension of attitude toward cancer. The results showed that most of the participants did not intent to exhibit proactive behavior toward cancer. However, behavioral dimension of attitude was divided into three parts as communication, lifestyle choices and social engagement and except communication part, most of the participants agreed with the statements in lifestyle choices and social engagement part.

According to the results, the idea of getting cancer did not motivate most of the participants to talk with someone and acquire more information about cancer. Therefore, teachers should be aware of this communication resistance about cancer and take an action to overcome. They may play an important role to communicate with students about cancer because Oakley et al. (1995) claimed that teenagers thought that teachers were the most confident to talk about cancer. To the study, teachers were followed by parents. That is why cancer education is very important for not only young people but also adults.

On the other hand, the idea of getting cancer motivated most of the students for a healthy life, to change their lifestyle and to help someone with cancer. Heuckmann and Asshoff's study (2014) had some similar findings with the current thesis about lifestyle choices and social engagement. They reported that more than half of the participants in their study stated that they were motivated for a healthy life and to help children with cancer by the idea of getting cancer. The reason of this motivation may be students' negative thoughts and emotions about cancer. As the level of students' negative thought increases, they may want to change their live in a healthier way and more engage socially about cancer.

Gender differences in attitudes toward cancer

In this study, the difference between female students and male students in terms of their attitudes toward cancer was investigated and a statistically significant gender difference was found in terms of their affective dimension of attitude toward cancer. The results showed that female students had stronger negative thoughts and emotions about cancer than males. The percentage of females who felt anxious, sad and scared when they thought about cancer was higher than males' percentage.

The literature has some studies which have similar findings with this study as well. According to the findings of Heuckmann and Asshoff study (2014), female students had more negative emotions toward cancer than males. Similarly, Kyle et al. (2012) claimed that female teenagers had more emotional barrier to ask for help about cancer from the doctor than males. They reported that female students were more worried about the possibility of diagnosed with cancer, scared, embarrassed and less confident to talk with doctors about cancer compared to males.

These findings of the studies may be the sign of a relationship between cancer knowledge level and having more negative emotions. Females may have more negative thoughts as they learn about cancer or they may be more knowledgeable since their negative emotions encourage them to know more about cancer.

Like in affective dimension of attitude toward cancer, there was a statistically significant difference between genders in terms of the participants' behavioral dimension of attitude toward cancer as well in general. It means that female students' behaviors were in more proactive way toward cancer. However, when the subsections of behavioral dimension were analyzed separately, it was seen that only there was a

statistically significant difference between females and males in social engagement part. It indicates that female students more tend to help cancer patients than males. Heuckmann and Asshoff's research (2014) has similar findings with the current research. According to their findings, females exhibited more proactive behavior for cancer than males in each part of behavioral dimension of attitude. In addition; Tempark et al., (2012) confirms these findings. They reported that male students stay more under sunlight and less use sunscreen than females. The reason of this more cancer-protecting behavior in females may be because of having more negative thoughts and knowing more about cancer. They may tend to take an action more to be prevented from cancer.

Students' interest in learning about cancer

Another aim of the study was to investigate high school students' interests in cancer. Although most of the participants were not interested in cancer overall, more than half of them were interested in human biology, cancer treatment methods, symptoms of cancer, cancer genesis, brain tumors and leukemia. The reason of the interest in these items may be about students' background knowledge since they learn cancer in biologic dimension, some risk factors, symptoms and treatment methods of cancer in health and biology courses. Also, the reason of interest toward leukemia may be because of it is the most common childhood cancer in Turkey (Gültekin et. al, 2016). Contrary to the findings of current study Heuckmann and Asshoff (2014) reported that the students exhibited high interest in cancer. The source of this higher interest may be related to cancer incidence is higher in European Union than in Turkey (Gültekin et. al, 2015). However, brain tumors, leukemia, symptoms of cancer and cancer genesis were common items which were found interesting by the participants in both the

current study and Heuckmann and Asshoff's research (2014).

Gender differences in students' interest in learning about cancer

This study also investigated whether students' interests in cancer were gender specific or not. When all items were examined together, the results showed that there was no statistically significant difference between females and males contrast to the findings of Heuckmann and Asshoff's study (2014). To their findings, female students were more interested in cancer than males. However, when each item was examined separately, the results of the current research showed that female students were more interested in "cancer in general", "skin cancer" and "breast cancer" than males.

In the literature, there are various studies which reports that female students tend to exhibit more sun-protecting behavior than males (Tempark et al., 2012). In addition, Mizukoshi and Akamatsu (2013) examined males' skin care habits and reported that 37.8% of them did not use any skin care product unlike women. These behaviors and skin care differences between women and men may be an indicator of female students' higher interest in skin cancer. Furthermore, breast cancer is the most common cancer type among women in the world and Turkey (Gültekin et al., 2016; Torre et al., 2015). Due to this prevalence in breast cancer, female students may show more interest than males. Sugisaki et. al. (2014) also reported that female students' breast cancer understanding was higher than male students. Similarly, there was a statistically significant difference between female and male students in terms of their interest in prostate cancer. According to the results of current study, males showed more interest toward prostate cancer than females. This interest also may be explained by the fact that prostate cancer is one the most common cancer types among men (Gültekin et al.,

2016). According to the results of the current study, each gender was more interested in the most common cancer types which are diagnosed in their own gender. Similarly, Ricker et al. (2007) reported that people tended to acquire information about personal cancer risk.

The relationship among students' level of knowledge on cancer risk factors, attitudes and interest toward cancer

One of the aim of this study was to explore whether there was a relationship among students' cancer knowledge level about risk factors, their attitudes toward and interest in cancer. According to the results, no relationship was found among the participants' cancer knowledge level about risk factors, their attitudes toward and interests in cancer. But, contrary to the findings of the current study, Heuckmann and Asshoff's (2014) determined that there was a positive correlation between students' interest in cancer and cancer protecting behavior. Besides, they stated that students' cancer knowledge level about risk factors did not correlate with any parts of behavioral dimension of attitude like in the current study.

On the other hand, the findings of the current research indicated that the participants who had more negative thoughts and emotions about cancer tended to show more proactive behavior. Heuckmann and Asshoff (2014) had similar findings in their research as well. They reported that the students who had stronger negative thoughts for cancer tended to talk more about cancer, live a healthier life and help someone with cancer. These negative emotions toward cancer such as fear, anxiety and sadness may make a contribution to students' empathy skills. As a result of negative thoughts for cancer, they may want to change their live in a healthier way and help cancer patients.

In addition, each part of behavioral dimension of attitude positively correlated among them. It may mean that the participants who are more open to communicate with someone about cancer may more tend to change their lives in a heathier way and help someone with cancer.

Implications for practice

- Curriculum developers may detect students' existing cancer knowledge level, attitudes and interest towards\ cancer before developing a curriculum. The curriculum which is prepared by curriculum developers taking into account students' need and knowledge level about cancer may increase their awareness. Thus, their negative behaviors may be eliminated and they may be encouraged to adopt a healthier life. Furthermore, according to the results of the current study specific objectives can be determined to be achieved by students. The followings may be some examples as specific objectives in a cancer education program or a health curriculum:

  - Identifying "overweight" as a carcinogenic factor

  - Identifying "numerous birthmarks" as a non-carcinogenic factor

  - Stating current cancer treatment methods (This objective may be helpful to eliminate students' negative attitudes towards cancer. Besides, the results of the current study showed that more than half of the students were already interested in "types of cancer therapy."

  - Recognizing symptoms of cancer (According to the results of the current study, the participants already found interesting "symptoms of cancer." This interest is a sign of students' motivation to more learn about symptoms of cancer and therefore it can be utilized while developing a curriculum or program for cancer education)

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- Recognizing healthy and unhealthy lifestyle habits.

- Adopting healthy lifestyle habits.

- Comparing "human biology" with "cancer biology". (The results indicated that "human biology in general" is the most stimulate item the students' interest. In order to motivate students' to more learn about cancer, biological process of cancer can be associated with "human biology."

- Teachers may determine students' existing knowledge level about cancer, attitudes toward and interest in cancer as well before teaching it. Thus, they can prepare their lessons accordingly and these lessons may be more effective to increase students' cancer awareness, remove their negative thought about cancer and change their lifestyle in a good way.

- According to students' existing cancer awareness and perception, material designers can develop new lesson materials for an effective learning and teaching process in cancer education.

- Schools and teachers may arrange some extracurricular activities about cancer such as communicating with cancer patients or organizing a campaign to draw attention to cancer.

- Seminars can be organized to educate students about the importance of self-examination in early diagnosis of cancer and how to perform it.

- Television and media may be more included in cancer education to create awareness and inform people about new developments in cancer treatment, campaigns and activities.

- According to gender differences in students' level of knowledge on, attitudes towards and interest in cancer, different education programs, strategies and

approaches can be arranged. For example, a target population can be determined and educated for gender specific cancer types. In addition, students' interest can be considered while arranging a seminar or conference about cancer.

Implications for further research

- The aim of the research was to investigate high school students' level of knowledge on risk factors causing cancer, attitudes toward and interest in cancer. In addition to high school students, primary school students, middle school students, university students, teachers and academicians may be included in the study.

- Other researchers can investigate students' level of knowledge on common cancer types, symptoms and treatment methods in addition to risk factors. Also, they can explore the source of information about cancer.

- This research investigated affective dimension of attitude toward cancer in terms of negative emotions. Other researchers can also explore the source of these negative emotions.

- This research investigated students' interest in cancer. Further research can explore the reason of these interests in cancer.

- Other researchers can investigate students' healthy living habits to be prevented from cancer.

- This research investigated gender differences in terms of cancer knowledge level, attitudes toward and interest in cancer. For further studies in addition to gender, grade, school, city, age, family history in cancer, educational background and socio economic status differences can be investigated.

- This research was conducted in the private schools. Other researchers can prefer public schools, universities and communities. A nationwide survey can be conducted for further studies.

Limitations

In this study, convenience sampling was used and participants consisted of only students who were at private and International Baccalaureate (IB) schools. Also, the sample included only eleventh and twelfth grade students. Therefore, the results and discussion may not be generalized for all high school students in Turkey. In addition, the 12th grade students could not participate in the survey at School 4 in Ankara because they were not at the school to be prepared for university entrance exam.

Summary

The followings are the summary of this research:

- Most of the students are successful at identifying cancer risk factors except overweight and each non-carcinogenic factor.

- While females are more successful at identifying "going to the solarium often" and "excessively exposed to sunlight" items as risk factors for cancer, males are more successful at identifying "numerous birthmarks" item as a non-carcinogenic factor. However, there is no statistically significant difference between females and males in terms of cancer knowledge level about risk factor overall.

- Most of the students have negative thoughts and emotions about cancer when they think about it and face with the idea of getting it.

- Most of the students are not motivated to talk someone about cancer or acquire more information about it by the idea of getting cancer. However, this idea

motivates them to change their lifestyles in positive way and to help people with cancer.

- Female students show stronger negative feelings and thoughts about cancer than males. Also, female students tend to more help someone with cancer than males.

- Most of the students are not interested in cancer. "Human biology in general" and "types of cancer therapy in general" are the most interesting items for the students.

- While females are more interested in "cancer in general", "skin cancer" and "breast cancer" than males, "prostate cancer" is the most interesting cancer type for males. However, there is no statistically significant difference between gender in terms of their interest in cancer overall.

- No statistically significant correlation was found among the students' cancer knowledge level about risk factors, attitude toward and interest in cancer. However, there is a statistically significant relationship between the students' negative emotions and cancer-protecting behaviors. In addition, each part of behavioral dimension (communication, lifestyle choices and social engagement) positively correlated among themselves.

REFERENCES

Aigner, K.R., & Stephens, F.O. (2011). *Introduction to chemptherapy: Integrated treatments programs for locally advanced cancers* [Adobe Acrobat Reader DC version]. doi: 10.1007/978-3-642-18173-3

Anderson, A. S., Key, T. J., Norat, T., Scoccianti, C., Cecchini, M., Berrino, F., … Romieu, I. (2015). European code against cancer 4th edition: Obesity, body fatness and cancer. *Cancer Epidemiology*, *39*, S34–S45. Retrieved from http://www.cancerepidemiology.net/article/S1877-7821(15)00071-5/pdf

AP. (2011). Biology curriculum framework. Retrieved from https://apstudent.collegeboard.org/home

Arslan, Z., & Ünver, E. (2015). *Ortaöğretim biyoloji 12 ders kitabı*. Retrieved from http://www.meb.gov.tr/Ders_Kitaplari/2016_yeni/biyoloji_12_ipekyolu.pdf

Asuquo, I.M., & Olajide, T.E. (2015). The role of health education on breast cancer awareness among University of Calabar female undergraduates. *Journal of Education and Practice, 6*(24), 151-161.

Becker, C. M., Xu, L., & Chaney, B. (2016). Using the 7C framework for teaching & learning health education & promotion. *Journal of Health Education Teaching, 7*(1), 32–38.

Borman, P., Yaman, A., Yasrebi, S., & Özdemir, O. (2016). The importance of awareness and education in patients with breast cancer-related lymphedema. *Journal of Cancer Education*, 1–5. doi:10.1007/s13187-016-1026-1

Breckler, S. J. (1984). Empirical validation of affect, behavior, and cognition as

    distinct components of attitude. *Journal of Personality and Social Psychology*,

    47(6), 1191–1205. doi: 10.1037/0022-3514.47.6.1191

Cancer. (n.d.). In *Merriem-Webster.com.* Retrieved from http://www.merriam-

    webster.com/dictionary/cancer

Carey, P. (1992). Teachers' attitudes to cancer education: A discussion in the light of

    a recent English survey. *Journal of Cancer Education, 7*(2), 153-161.

Cribb, A. (1990). School teachers' perceptions of relative importance of cancer

    education in the United Kingdom. *Journal of Cancer Education, 5*(4), 225-229.

Dore, J.-F., & Chignol, M.-C. (2012). Tanning salons and skin cancer.

    Photochemical & Photobiological Sciences, *11*(30), 30–37. doi:

    10.1039/c1pp05186e

El-Metwally, T.H. (2009). *Cancer biology: An updated global overview* [Adobe

    Acrobat Reader DC version]. Retrieved from

    http://eds.a.ebscohost.com/eds/ebookviewer/ebook/bmxlYmtfXzM1NDMyNF9

    fQU41?sid=70b3b6a4-0a80-48e1-9566-

    64e21c3ede67@sessionmgr4009&vid=15&format=EB&rid=1

Fraenkel, J. R., & Wallen, N. E. (2006). *How to design and evaluate research in

    education*. Boston: McGraw-Hill.

Greenhalgh, T. A., & Symonds, R. P. (2014). Principles of chemotherapy and

    radiotherapy. *Obstetrics, Gynaecology and Reproductive Medicine*, *24*(9), 259–

    265. doi: 10.1016/j.ogrm.2014.06.004

Gültekin, M., Boztaş, G., Utku, E.Ş., Kavak Ergün, A., Sevinç, A., Tütüncü, S.,

    …Seymen, E. (2015). *Turkey cancer statistics*. Retrieved from

    http://kanser.gov.tr/Dosya/ca_istatistik/ANA_rapor_2012sooonn.pdf

Gültekin, M., Boztaş, G., Utku, E.Ş., Kavak Ergün, A., Sevinç, A., Tütüncü, S.,
…Seymen, E. (2016). *Turkey cancer statistics*. Retrieved from
http://kanser.gov.tr/Dosya/ca_istatistik/ANA_rapor_2013v01_2.pdf

Gültekin, M., Özgül, N., Olcayto, E., & Tuncer, M. (2011). Level of knowledge
among Turkish people for cancer and cancer risk factors. *Journal of Turkish
Society of Obstetrics and Gynecology, 8*(1), 57-61.

Haghani, S., Shahnazi, H., & Hassanzadeh, A. (2017). Effects of tailored health
education program on overweight elementary school students' obesity-related
lifestyle: a school-based interventional study. *Oman Medical Journal, 32*(2),
140–147. doi: 10.5001/omj.2017.25

Heuckmann, B., & Asshoff, R. (2014). German high school students' attitudes and
interest in cancer and factors influencing proactive behaviour for cancer
prevention. *Journal of Cancer Education*, *29*(3), 497–505. Retrieved from
https://doi.org/10.1007/s13187-014-0634-x

Hill, T. G., Briant, K. J., Lopez, K., & Vinson, E. (2010). Evaluation of cancer 101 :
an educational program for native settings. *Journal of Cancer Education, 25*,
329–336. doi: 10.1007/s13187-010-0046-5

IBO. (2014c). Diploma Programme: Biology guide. Retrieved from
http://www.ibo.org/

IBO. (2014a). Middle Years Programme: Physical and health education guide.
Retrieved from http://www.ibo.org/

IBO. (2014b). Middle Years Programme: Sciences guide. Retrieved from
http://www.ibo.org/

IBO. (2009). Primary Years Programme: Personal, social and physical education
scope and sequence. Retrieved from http://www.ibo.org/

IBO. (2008). Primary Years Programme: Science scope and sequence. Retrieved from http://www.ibo.org/

Interest. (n.d.). In *Cambridge.org.* Retrieved from http://dictionary.cambridge.org/dictionary/english/interest

International Agency for Research on Cancer, World cancer report 2008 (2008). *Report of the IARC World cancer report 2008.* Retrieved from http://www.iarc.fr/en/publications/pdfs-online/wcr/2008/wcr_2008.pdf

Karayurt, Ö., Özmen, D., & Çakmakiçi Çetinkaya, A. (2008). Awareness of breast cancer risk factors and practice of breast self examination among high school students in Turkey. *BMC Public Health.* Advance online publication. doi: 10.1186/1471-2458-8-359

Kaya, A., & Demirel, K. (Ed.). (n.d.). *Ortaöğretim biyoloji 11. sınıf.* Retrieved from http://www.meb.gov.tr/Ders_Kitaplari/2016_yeni/biyoloji_11_meb.pdf

Keten, H. S., Isik, O., Guvenc, N., Ersoy, O., & Celik, M. (2015). Evaluation of the Level of Knowledge of Oral Cancer Among High School Students. *Journal of Cancer Education*, *32*(1), 79–84. doi: 10.1007/s13187-015-0936-7

Knighting, K., Rowa-Dewar, N., Malcolm, C., Kearney, N., & Gibson, F. (2011). Children's understanding of cancer and views on health-related behaviour: A "draw and write" study. *Child: Care, Health and Development*, *37*(2), 289–299. doi: 10.1111/j.1365-2214.2010.01138.x

Knowledge. (n.d.). In *Merriem-Webster.com.* Retrieved from https://www.merriam-webster.com/dictionary/knowledge

Koç, Z. (2015). University students' knowledge and attitudes regarding cervical cancer, human papillomavirus, and human papillomavirus vaccines in Turkey. *Journal of American College Health*, *63*(1), 13–22. doi:

10.1080/07448481.2014.963107

Kurtuncu, M., Akhan, L. U., Celik, S., & Alkan, I. (2014). Cancer awareness among university students in Turkey. *Asian Pacific Journal of Cancer Prevention*, *15*(10), 4289–4294. doi: 10.7314/APJCP.2014.15.10.4289

Krapp, A. (2007). An educational – psychological conceptualisation of interest. *International Journal for Educational and Vocational Guidance, 7*, 5–21. Retrieved from https://doi.org/10.1007/s10775-007-9113-9

Kyle, R. G., Forbat, L., & Hubbard, G. (2012). Cancer awareness among adolescents in Britain: a cross-sectional study. *BMC Public Health*, *12*(1), 580. doi: 10.1186/1471-2458-12-580

Lalla, J. K., Ogale, S., Achhra, C. V, Shah, M., & Parmar, D. (2013). Cancer. *International Journal of Research in Pharmacy and Chemistry*, *3*(1), 26–33.

Latino-Martel, P., Cottet, V., Druesne-Pecollo, N., Pierre, F. H. F., Touillaud, M., Touvier, M., … Ancellin, R. (2016). Alcoholic beverages, obesity, physical activity and other nutritional factors, and cancer risk: A review of the evidence. *Critical Reviews in Oncology/Hematology*, *99*, 308–323. doi: 10.1016/j.critrevonc.2016.01.002

Leitzmann, M., Powers, H., Anderson, A. S., Scoccianti, C., Berrino, F., Boutron-Ruault, M. C., … Romieu, I. (2015). European code against cancer 4th edition: Physical activity and cancer. *Cancer Epidemiology*, *39*, S46–S55. Retrieved from http://www.cancerepidemiology.net/article/S1877-7821(15)00076-4/pdf

Leon, M.E., Perugo, A., McNeill, A., Kraliova, E., Guha, N., Minozzi, S., … Schuz, J. (2015). Europian code againts cancer 4th edition: Tobacco and cancer. *Cancer Epidemiology, 39*, S20-S33. Retrieved from http://www.cancerepidemiology.net/article/S1877-7821(15)00129-0/pdf

Leuven, E., Plug, E., & Ronning, M. (2016). Education and cancer risk. *Labour Economics*, *43*, 106–121. doi: 10.1016/j.labeco.2016.06.006

Ministry of National Education. (2013d). Teaching program of biology course (Grade 9-12). Retrieved from http://ttkb.meb.gov.tr/program2.aspx?islem=1&kno=216

Ministry of National Education. (2013e). Teaching program of chemistry course (Grade 9-12). Retrieved from http://ttkb.meb.gov.tr/program2.aspx?islem=1&kno=218

Ministry of National Education. (2013a). Teaching program of physical education course (Grade 9-12). Retrieved from http://ttkb.meb.gov.tr/program2.aspx?islem=1&kno=19

Ministry of National Education. (2013f). Teaching program of physics course (Grade 9-12). Retrieved from http://ttkb.meb.gov.tr/program2.aspx?islem=1&kno=217

Ministry of National Education. (2012). Teaching program of secondary school health course. Retrieved from http://ttkb.meb.gov.tr/program2.aspx?islem=1&kno=91

Ministry of National Education. (2013b). Teaching program of science and technology course (Grade 4-5). Retrieved from http://ttkb.meb.gov.tr/program2.aspx?islem=1&kno=24

Ministry of National Education. (2013c). Teaching program of science and technology course (Grade 6-8). Retrieved from http://ttkb.meb.gov.tr/program2.aspx?islem=1&kno=25

Mizukoshi, K., & Akamatsu, H. (2013). The investigation of the skin characteristics of males focusing on gender differences, skin perception, and skin care habits. *Skin Research and Technology, 19*(2), 91–99. Retrieved from

https://doi.org/10.1111/srt.12012

Morse, L. L. (2013). Let schools do it! Helping schools find a role in cancer prevention. *Journal of Adolescent Health*, *52*(5 SUPPL), S89–S92. doi: 10.1016/j.jadohealth.2013.03.005

Moscow, J.A., & Cowan, K.H. (2011). Biology of cancer. In W.P. Arrend, &J.M. Armitage (Eds.), *Goldman's cecile medicine (24th ed.)* (pp. 1184-1187). Philadelphia: Elseiver/ Saunders

Norat, T., Scoccianti, C., Boutron-Ruault, M.C., Anderson, A., Berrino, F., Cecchini, M., … Romieu, I. (2015). European code against cancer 4th edition: Diet and cancer. *Cancer Epidomology, 39*, S56-S66. Retrieved from http://www.cancerepidemiology.net/article/S1877-7821(15)00070-3/pdf

Nutbeam, D. (2006). Health literacy as a public health goal : A challenge for contemporary health education and communication strategies into the 21st century contemporary health. *Health Promotion International, 15*(3), 259–268.

Oakley, A., Bendelow, G., Barnes, J., Buchanan, M., & Husain, O. A. N. (1995). Health and cancer prevention: knowledge and beliefs of children and young people. *BMJ (Clinical Research Ed.)*, *310*, 1029–1033.

Pintrich, P. R., Marx, R. W., Boyle, R. A., & Summer, N. (1993). Beyond cold conceptual change: the role of motivational beliefs and classroom contextual factors in the process of conceptual change. *Review of Educational Research*, *63*(2), 167–199.

Ricker, C. N., Hiyama, S., Fuentes, S., Feldman, N., Kumar, V., Uman, G. C., … Weitzel, J. N. (2007). Beliefs and interest in cancer risk in an underserved Latino cohort. *Preventive Medicine*, *44*(3), 241–245. doi: 10.1016/j.ypmed.2006.08.018

Risk factor. (n.d.). In Risk factor. (n.d.). In *Merriem-Webster.com.* Retrieved from

http://www.merriam-webster.com/dictionary/risk%20factor

Rivas, M., Rojas, E., Araya, M. C., & Calaf, G. M. (2015). Ultraviolet light

exposure, skin cancer risk and vitamin D production. *Oncology Letters*, *10*(4),

2259–2264. Retrieved from https://doi.org/10.3892/ol.2015.3519

Ruddon, R. W. (1995). *Cancer Biology.* New York: Oxford University Press.

Samuel, N., & Carmen, M. (2010). New approaches in the treatment of cancer.

Annals of Oncology, 14, 813-815. doi: 10.1093/annonc/mdg261

Schernhammer, E., Haidinger, G., Waldhör, T., Vargas, R., & Vutuc, C. (2010). A

study of trends in beliefs and attitudes toward cancer. *Journal of Cancer*

Education, *25*(2), 211–216. doi: 10.1007/s13187-010-0104-z

Schneider, K. (2001). Cell Biology and Cancer. In *Counseling about cancer:*

strategies for genetic counseling (pp. 1–17). New York: John Wiley & Sons

Scoccianti, C., Cecchini, M., Anderson, A. S., Berrino, F., Boutron-Ruault, M. C.,

Espina, C., … Romieu, I. (2015). European code against cancer 4th edition:

Alcohol drinking and cancer. *Cancer Epidemiology, 39*, S67-S74. Retrieved

from http://www.cancerepidemiology.net/article/S1877-7821(15)00023-5/pdf

Sherman, S. M., & Lane, E. L. (2014). awareness of risk factors for breast, lung and

cervical cancer in a UK student population. *Journal of Cancer Education*, *30*(4),

660–663. doi: 10.1007/s13187-014-0770-3

Siegel, R., Miller, K., & Jemal, A. (2015). Cancer statistics, 2015. *CA Cancer J Clin*,

65(1), 5-29. doi: 10.3322/caac.21254.

Soweid, R. A. A., Kak, F. E. L., Major, S. C., Karam, D. K., & Rouhana, A. (2003).

Changes in health-related attitude and self- reported behaviour of undergraduate

students at the american university of beirut following a health awareness

course. *Education for Health*, *16*(3), 265–278. doi:
10.1080/13576280310001607460

Sugisaki, K., Ueda, S., Monobe, H., Yako-Suketomo, H., Eto, T., Watanabe, M., &
Mori, R. (2014). Cancer understanding among Japanese students based on a
nationwide survey. *Environmental Health and Preventive Medicine*, *19*(6), 395–
404. doi: 10.1007/s12199-014-0406-6

Şenel, E., & Süslü, I. (2015). Knowledge , attitudes , and behaviors regarding sun
protection , effects of the sun , and skin cancer among Turkish high school
students and teachers. *Dermatologica Sinica*, *33.* 14–17. doi:
10.1016/j.dsi.2015.03.001

Tempark, T., Chatproedprai, S., & Wananukul, S. (2012). Attitudes, knowledge, and
behaviors of secondary school adolescents regarding protection from sun
exposure: a survey in Bangkok, Thailand. *Photodermatol Photoimmunol
Photomed* 2012, *28*(4), 200-206. doi: 10.1111/j.1600-0781.2012.00671.x

Torre, L. A., Bray, F., Siegel, R. L., Ferlay, J., Lortet-tieulent, J., & Jemal, A. (2015).
Global cancer statistics, 2012. *CA: A Cancer Journal of Clinicians.*, *65*(2), 87–
108. doi: 10.3322/caac.21262

Van Parijs, L. G. (1986). Public education in cancer prevention. *Bulletin of the World
Health Organization*, *64*(6), 917–927.

Wang, D., Stewart, D., Chang, C., & Shi, Y. (2015). Effect of a school-based
nutrition education program on adolescents ' nutrition-related knowledge ,
attitudes and behaviour in rural areas of China. *Environmental Health and
Preventive Medicine*, *20*, 271–278. doi: 10.1007/s12199-015-0456-4

World Health Organization, National cancer control programmes: Policies and
managerial guidilenes. (2002). *Report of the WHO National cancer control*

programmes: Policies and managerial guidilenes (WHO Publication No.

Retrieved from

http://apps.who.int/iris/bitstream/10665/42494/1/9241545577.pdf

APPENDIX A: The Questionnaire

Dear students,

The purpose of this survey is to investigate high school students' who are in grade 11 and 12 level of knowledge on cancer risk factors, attitudes toward and interest in cancer. It consists of four parts. In the first part, the questions are about your demographic information, in the second part, the questions are about level of knowledge on cancer risk factors, in the third part, there are questions that determine your attitudes toward cancer and in the last part you are asked to how much you are interested in the statements given. The survey takes about 15-20 minutes. Please answer all questions. Responses will be kept confidential. If you have any question or comment, please contact with Ilgın Yıldırım who is a graduate student in Graduate School of Education at Bilkent University.

Contact information:

Tel: 0506 763 61 87

e-mail: ilgin.yildirim@bilkent.edu.tr

Part I. Demographic Information

1. **Gender**
   a) Female   **b)** Male

2. **Age/date of birth**

3. **Grade**

4. **The curriculum that is implemented**
   a) International Baccalaureate Diploma Programme (IBDP)
   o   Biology standard level
   o   Biology high level
   o   No biology

   b) Ministry of national education program
5. **Your mother's educational background**

   o   Primary school graduate
   o   Middle school graduate
   o   High school graduate
   o   Graduate (bachelor's degree)
   o   Master's degree
   o   PhD degree
6. **Your father's educational background**

   o   Primary school graduate
   o   Middle school graduate

- o High school graduate
- o Graduate (bachelor's degree)
- o Master's degree
- o PhD degree

7. The amount of monthly income

8. Do you have anyone who suffers from cancer in your family?

9. If you have, who is it and what type of cancer s/he suffers from?

Part II: The Relationship Between Cancer and The Statements Given

10. Do you see a relationship between cancer and the following statements?

According to your answer, tick yes or no.

	Yes	No
a. going to the solarium often		
b. numerous birthmarks		
c. excessively exposed to sun light		
d. drinking alcohol		
e. smoking cigarettes, cigars or cigarillo		
f. consuming drugs		
g. radioactive radiation		
h. overweight		
i. ultraviolet radiation		
j. hypertension		
k. x-ray radiation		
l. frequent common cold		
m. smoking the hookah		
n. contact with cancer patients (e.g. by contacting skin of an cancer patient)		

Part III: The Attitudes Toward Cancer

11. Choose a score for the following statements from 1 to 4.

Strongly disagree (1), disagree (2), agree (3) and strongly agree (4).

	1	2	3	4
a. I think, suffering from cancer is one's own fault				
b. I think, suffering from cancer is a question of proper nutrition				
c. I think, suffering from cancer is a result of lifestyle				
d. I think, suffering from cancer is a question of mental attitude				
e. I think, suffering from cancer is a question of personality				
f. Faced with the idea of getting cancer I feel depressed				
g. Thinking about cancer I have negative thoughts				
h. Thinking about getting cancer makes me feel anxious				
i. Faced with the idea of getting cancer I feel uncertain				
j. Thinking about cancer, I feel worried				
k. Thinking about cancer, I feel sad				
l. Cancer diseases make me feel scared				
m. The idea of getting cancer motivates me to talk about it with my parents				
n. The idea of getting cancer motivates me to gather information about the issue				
o. The idea of getting cancer motivates me to speak with my friends about my anxieties				
p. The idea of getting cancer motivates me to talk with affected persons				
q. The idea of getting cancer motivates me to live a healthier life				
r. The idea of getting cancer motivates me to change my way of life				
s. The idea of getting cancer motivates me to donate for a person who suffers from cancer				
t. The idea of getting cancer motivates me to participate for children with cancer				

Part IV: Interest in Cancer

12. Choose a score for how much you are interested in each topic.

Not interesting (1), rather not interesting (2), interesting (3), very interesting (4).

111

	1	2	3	4
a. human biology in general				
b. cancer in general				
c. lung cancer				
d. colorectal cancer				
e. prostate cancer				
f. stomach cancer				
g. liver cancer				
h. kidney cancer				
i. cancer of the oral cavity and pharynx				
j. oesophageal cancer				
k. leukemia (blood cancer)				
l. bladder cancer				
m. skin cancer				
n. laryngeal cancer				
o. breast cancer				
p. gallbladder cancer				
q. cervical cancer				
r. testicular cancer				
s. brain tumors				
t. symptoms of cancer in general				
u. cancer genesis				
v. types of cancer therapy in general				
w. chemotherapy				
x. radiation therapy				
y. tumor removal by surgery				

z. alternative types of cancer therapy				
aa. history of cancer medicine				

Thank you for completing the survey. Your responses will help to develop a health education curriculum or program.

Reference

Heuckmann, B., & Asshoff, R. (2014). German high school students' attitudes and interest in cancer and factors influencing proactive behaviour for cancer prevention. *Journal of Cancer Education*, *29*(3), 497–505. Retrieved from http://doi.org/10.1007/s13187-014-0634-x

APPENDIX B: Permission From the Developer of the Questionnaire

Subject:	AW: AW: German high school students` attitudes towards cancer
From:	"Heuckmann, Benedikt" <benedikt.heuckmann@uni-muenster.de>
Date:	Mon, February 15, 2016 2:51 pm
To:	"ilgin.yildirim@bilkent.edu.tr" <ilgin.yildirim@bilkent.edu.tr>
Priority:	Normal
Allow Sender:	Allow Sender	Allow Domain	Block Sender	
Create Filter:	Automatically	From	To	Subject
Options:	View Full Header	View Printable Version	Download this as a file	View Message Details	Add to Address Book	Spam

Dear Ilgin,
I am sorry for my late response. Of course I permit you to reference our article and
I am pleased to briefly check your version of the questionnaire.

Regarding the joint article: We should wait until all data is collected before we
can decide to compare German und Turkish students. Since there are huge cultural
differences in the study population and no attempts were made by us to validate the
attitude and interest questionnaire for students with different cultural
backgrounds. Thus, I am not totally sure if a comparison is possible. But we should
wait until you have collected the data.

With best wishes
Benedikt Heuckmann

--
Benedikt Heuckmann
Research Assistant

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Homepage: http://www.uni-muenster.de/Biologie.Didaktik/en/mitarbeiter/Heuckmann.html
-----Ursprüngliche Nachricht-----
Von: ilgin.yildirim@bilkent.edu.tr [mailto:ilgin.yildirim@bilkent.edu.tr]
Gesendet: Mittwoch, 27. Januar 2016 21:17
An: Heuckmann, Benedikt <benedikt.heuckmann@uni-muenster.de>
Betreff: Re: AW: German high school students' attitudes towards cancer

APPENDIX C: Permission From MoNE

12-6/ 0 0 4 9 9 1

T.C.
MİLLÎ EĞİTİM BAKANLIĞI
Özel Öğretim Kurumları Genel Müdürlüğü

Sayı : 95178074-405.01-E.3022111   15.03.2016
Konu: Araştırma İzni

BİLKENT ÜNİVERSİTESİ REKTÖRLÜĞÜNE
(Eğitim Bilimleri Enstitüsü Müdürlüğü)

İlgi: Bilkent Üniversitesi Eğitim Bilimleri Enstitüsü Müdürüğü'nün 02.03.2016 tarihli ve
66319886.E.27.00.00/176.26/3984 sayılı yazısı

İlgi (a) yazınız ve ekleri incelenmiştir. İlgi (a) yazınız ve eklerinden; " Bilkent Üniversitesi Eğitim Bilimleri Enstitüsü 'Eğitim Programları ve Öğretim' yüksek lisans öğrencisi Ilgın YILDIRIM'ın, ilgi yazınız ekinde belirtilen özel okullarda yüksek lisans tezi için araştırma faaliyetini uygulamak istediği, bu hususta Genel Müdürlüğümüzden izin talep edildiği" anlaşılmaktadır.

Bilkent Üniversitesi Eğitim Bilimleri Enstitüsü 'Eğitim Programları ve Öğretim' yüksek lisans öğrencisi Ilgın YILDIRIM'ın, ilgi yazınız ekinde belirtilen özel okullarda yüksek lisans tezi için 'araştırma önerisi' faaliyeti için uygulamada bulunması Genel Müdürlüğümüzce uygun görülmüştür.

Bilgilerinizi rica ederim.

Kemal ŞAMLIOĞLU
Bakan a.
Genel Müdür V.

Atatürk Blv. 06648 Kızılay/ANKARA   Ayrıntılı bilgi için: Ad SOYAD Ünvan
Elektronik Ağ: www.meb.gov.tr   Tel: (0 312) XXX XX XX 21.3.16
e-posta: adsoyad@meb.gov.tr   Faks: (0 312) XXX XX XX   EBE

...... elektronik imza ile imzalanmıştır. http://evraksorgu.meb.gov.tr adresinden 9639-f14c-33cc-8ed4-d4e5 kodu ile tevit edilebilir.