

# The relationship between health sciences students' knowledge of cancer and behavioral styles

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## ABSTRACT

**Objective:** This study aimed to determine the relationship between knowledge of cancer and behavioral styles of health sciences faculty students registered at a state university. **Method:** The study is cross-sectional and descriptive. The study sample consisted of 1204 students at the Faculty of Health Sciences of a state university in Istanbul during the 2018-2019 fall semester. The Questionnaire Form and Miller Behavioral Style Scale (MBSS) were administered to the students. The data were evaluated using the SPSS package program in the computer environment. **Results:** The students' mean age was 20.74±2.603. It was determined that at least one relative of 32.2% of the students had cancer, grandfathers mostly had cancer, and lung cancer was the most common cancer. A statistically significant difference was found upon examining the knowledge of cancer risks and early diagnosis methods of the students with and without a family history of cancer. The mean MBSS score was found to be 6.49±4.085 for students with a family history of cancer, and 5.97±4.092 for students without a family history of cancer. There was a significant difference when statistically comparing the mean MBSS scores of the students with and without a family history of cancer. **Conclusion:** Students with a family history of cancer were more knowledgeable about cancer risk factors and early diagnosis methods and applied early diagnosis methods such as mammography, clinical breast examination, and endoscopic examinations. Furthermore, the mean MBSS scores of students with a family history of cancer were higher than those without a family history of cancer.

**Keywords:** Cancer, early diagnosis, familial, behavior, nursing

## Sağlık bilimleri öğrencilerinin kanser bilgileri ile davranış biçimleri arasındaki ilişki

## ÖZET

**Amaç:** Bir devlet üniversitesinde kayıtlı sağlık bilimleri fakültesi öğrencilerinin kanser bilgileri ile davranış biçimleri arasındaki ilişkinin belirlenmesi amaçlanmıştır. **Yöntem:** Araştırma kesitsel ve tanımlayıcıdır. Araştırmanın örneklemini İstanbul'da bulunan bir devlet üniversitesinin 2018-2019 güz dönemi Sağlık Bilimleri Fakültesinde öğrenim gören 1204 öğrenci oluşturdu. Öğrencilere Anket Formu ve Miller Davranış Biçimleri Ölçeği (MBSS) uygulandı. Veriler bilgisayar ortamında SPSS paket programı kullanılarak değerlendirildi. **Bulgular:** Öğrencilerin yaş ortalaması 20.74±2.603'tür. Öğrencilerin 32.2%'sinin ailesinde en az bir yakınında kanser olduğu, en çok dedelerde kanser olduğu ve en çok akciğer kanserine rastlandığı belirlendi. Ailesinde kanser olan ve olmayan öğrencilerin kanser risklerini ve erken tanı yöntemlerini bilme durumu incelendiğinde istatistiksel olarak anlamlı fark bulundu. Ailesinde kanser öyküsü olan öğrencilerin MBSS puanı ortalaması 6.49±4.085, ailesinde kanser öyküsü olmayan öğrencilerin MBSS puanı ortalaması 5.97±4.092 olarak bulundu. Ailesinde kanser öyküsü olan ve olmayan öğrencilerin MBSS puan ortalamaları istatistiksel olarak karşılaştırıldığında anlamlı bir fark vardı. **Sonuç:** Ailesinde kanser öyküsü olan öğrencilerin kanser risk faktörleri ve erken tanı yöntemleri konusunda daha bilgili oldukları ve mamografi, klinik meme muayenesi, endoskopik incelemeler gibi erken tanı yöntemlerini uyguladıkları görülmüştür. Ayrıca ailesinde kanser öyküsü olan öğrencilerin MBSS puan ortalamaları, ailesinde kanser öyküsü olmayanlara göre daha yüksek bulundu.

**Anahtar Kelimeler:** Kanser, erken tanı, ailesel, davranış, hemşirelik

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## INTRODUCTION

According to the World Health Organization (WHO), cancer ranks second among the causes of death in the world. Cancer was responsible for approximately 10 million deaths in 2020. Globally, cancer causes one of every 6 deaths.<sup>1</sup>

According to the 2020 data of GLOBOCAN and the World Health Organization-International Agency for Research on Cancer (WHO-IARC), 9.2 million new cancer cases mostly include breast, colorectal, and lung cancers in women of all age groups. In women, 4.4 million cancer deaths mostly result from breast, lung, Colorectal Cancers (CRC), respectively. In men, 10 million new cancer cases mostly include lung, prostate, and CRC, respectively. In men, 5.5 million cancer deaths mostly result from lung, liver, stomach cancers, respectively.<sup>2</sup> As in the world, cancer continues to be the primary health problem in Turkey.<sup>3</sup>

Cancer prevention is an issue to address primarily. The evaluation of risk factors is what needs to be addressed in primary cancer prevention.<sup>4</sup> Of cancers, 30-50% can be prevented by avoiding the existing risk factors and applying the existing evidence-based prevention strategies. When cancer is diagnosed early, cancer is more likely to respond to effective treatment, the patient is more likely to survive, morbidity is less, treatment is cheaper.<sup>1</sup> Therefore, the priority in secondary cancer prevention is to teach individuals the methods of early diagnosis and help them apply the methods of early diagnosis by attending screening programs.

In Turkey, there are national screening programs, especially for the early diagnosis of breast, cervical and CRC.<sup>5</sup> National community-based breast, cervical, CRC screenings are carried out by Family Health Centers (FHCs) and Cancer Early Diagnosis, Screening and Training Centers (CEDSTCs) within Community Health Centers (CHCs).<sup>6-8</sup>

It is necessary to provide education on primary and secondary prevention of cancers in all educational institutions and all parts of life to increase students' knowledge of cancer. Accordingly, cancer mortality can be reduced. This study was planned to investigate the relationship between knowledge of cancer and behavioral styles of students at the faculty of health sciences with and without a family history of cancer.

## METHOD

### *Design, Setting, and Sample*

The research is a cross-sectional and descriptive study. The study population consisted of 2232 students registered in the faculty of health sciences (midwifery, physiotherapy and rehabilitation, audiology, health

management, social service departments) of a state university in Istanbul in the fall semester of 2018-2019. The sample size was determined as a minimum of 328 students according to the 5% standard error margin and 95% confidence interval. However, the study sample comprised 1204 students who voluntarily agreed to participate in the study after information was provided verbally and who filled out the Miller Behavioral Style Scale (MBSS) completely.

The research was conducted by filling out the printed materials (The Questionnaire Form and the Miller Behavioral Style Scale) individually by each participant.

The research materials were distributed in the classroom environment and the students were left alone. The students were filled their research materials in 10-15 minutes and left them on the teacher's desk. When no students were left in the classroom, research materials were taken from the teacher's desk.

### *Measures*

The Questionnaire Form was applied to the students who agreed to participate in the study. The form contained general information about their socio-demographic characteristics, cancer-related background/family history, and cancer.

To determine behavioral styles, the Miller Behavioral Style Scale (MBSS) was developed by the psychologist Dr. Suzanne M. Miller, a lecturer at Temple University, in 1981 to evaluate the information-seeking behavioral styles of individuals *under threat/at risk*. The Miller Behavioral Styles Scale (MBSS) measures the information-seeking behavior styles of all adult individuals with threats/risks.<sup>9</sup>

### *Statistical Analysis*

The data were analyzed using the SPSS 20.0 packaged software. Descriptive statistical methods (mean, standard deviation, median, frequency, ratio, minimum, maximum) were used while evaluating the research data. Moreover, Student's t-test was used to compare two groups of normally distributed parameters, and the Kruskal-Wallis test was used to compare more than two groups of non-normally distributed parameters. The results were evaluated using the 95% confidence interval, representing the significance level of 0.05 ( $p < 0.05$ ).

### *Ethical Considerations*

Ethical approval (Protocol code 2018/277) was obtained from the clinical research ethics committee of a state hospital before initiating the study. Permission was obtained to use the MBSS. Furthermore, institutional permission was obtained from the Dean of

the Faculty of Health Sciences, and written consent was obtained from the students who volunteered to participate in the study. Authors are declared that the study was conducted in accordance with the Declaration of Helsinki and followed the ethical standards of the country of origin.

## RESULTS

The mean age of the students participating in the study is 20.74±2.603 (Min=1; Max=57) years. Of the participating students, 32.2% had a family history of cancer. When the students' degrees of consanguinity with family members who had cancer were examined,

paternal grandfathers of 19.2%, maternal grandfathers of 15.8%, maternal grandmothers of 13.2% had cancer, respectively. Of female relatives, 10.1% had breast cancer in the first place, and 17.3% of male relatives had lung cancer in the first place (Table 1).

When the mean MBSS scores of students with and without a family history of cancer were compared with the t-test, a statistically significant difference was found in the mean MBSS scores of those with a family history of cancer (p=0.037, p<0.05). According to the mean MBSS scores, students with a family history of cancer were found to be high monitors (Table 1).

**Table 1. Family cancer status, degree of consanguinity and cancer types (n=1204)**

Knowledge about cancer status	n	%	MBSS Sd±SS*	t	p
<b>Family cancer status</b>					
Yes	388	32.2	6.49±4.085	-2.083	<b>0.037</b>
No	816	67.8	5.97±4.092		
<b>Degree of consanguinity with the family member who has cancer* (n=515)</b>					
Paternal grandfather	99	19.2			
Maternal grandfather	81	15.8			
Maternal grandmother	-	68	13.2		
Paternal uncle	-	51	9.9		
Maternal aunt	-	46	8.9		
Paternal grandmother	44	8.5			
Paternal aunt	-	36	7.0		
Maternal uncel	-	30	5.8		
Mother	-	29	5.6		
Father	-	27	5.3		
Sister	-	3	0.6		
Brother	-	1	0.2		
<b>Cancer types in the family** (n=515)</b>					
	<b>Female relativae</b>		<b>Male relatives</b>		<b>Total</b>
	n	%	n	%	n %
Cancer type unknown	36	7.0	48	9.3	84 16.3
Lung cancer	<b>20</b>	<b>3.9</b>	<b>89</b>	<b>17.3</b>	109 21.2
Breast cancer	<b>52</b>	<b>10.1</b>	--	--	52 10.1
Colorectal cancer	17	3.3	<b>27</b>	<b>5.2</b>	44 8.5
Stomach cancer	11	2.2	<b>30</b>	<b>5.8</b>	41 8.0
Cervical cancer	<b>32</b>	<b>6.2</b>	--	--	32 6.2
Prostate cancer	--	--	23	4.5	23 4.5
Other types of cancer	58	11.2	72	14.0	130 25.2
Total	226	43.9	289	56.1	515 100.0

\* MBSS (Miller Behavioral Style Scale) : The mean MBSS scores of students with and without cancer in their family was given.

\*\* At least 1 and at most 5 relatives of students have cancer and the first six most common cancers were included.

A statistically significant difference was observed between smoking, diet/nutrition, environmental factors, and genetic risk factors when the knowledge of cancer risks of students with and without a family history of cancer was compared. Individuals with a family history of cancer are more knowledgeable about cancer risk factors (Table 2).

Mammography, BSE (Breast Self-Examination), Pap-smear, CBE (Clinical Breast Examination) were compared and examined only in female students to evaluate the knowledge of early diagnosis methods of students with and without a family history of cancer, X-rays and endoscopic examinations were compared and examined in all students. A statistically significant difference was found between female students who had a family history of cancer, knew how to undergo mammography and Pap-smear test, underwent

mammography and CBE among early diagnosis methods and female students who did not have a family history of cancer. A statistically significant difference was identified between students who had and did not have a family history of cancer in terms of undergoing endoscopic examinations. Students with a family history of cancer were more knowledgeable about and applied early diagnosis methods for cancer (Table 3).

The mean MBSS score of all participating students (n=1204) was 6.14±4.096. According to the mean MBSS score, 52.7% of all students were found to be **low monitors** and 47.3% to be **high monitors**. No statistically significant difference was found between the total number of relatives with cancer in the family and the mean MBSS scores of students with a family history of cancer.

**Table 2. Knowledge of cancer risks of students with and without a family history of cancer**

Cancer Risks		With cancer in family		Without cancer in family		X <sup>2</sup>	p
		n	%	n	%		
Smoking	Knowing	156	40.2	276	33.8	4.656	0.031
	Not knowing	232	59.8	540	66.2		
Alcohol consumption	Knowing	115	29.6	201	24.6	3.405	0.065
	Not knowing	273	70.4	615	75.4		
Diet / Nutrition	Knowing	131	33.8	177	21.7	20.129	0.000
	Not knowing	257	66.2	639	78.3		
Inactivity	Knowing	26	6.7	44	5.4	0.823	0.364
	Not knowing	362	93.3	772	94.6		
Gender	Knowing	20	5.2	25	3.1	3.195	0.074
	Not knowing	368	94.8	791	96.9		
Age	Knowing	27	7.0	44	5.4	1.163	0.281
	Not knowing	361	93.0	772	94.6		
Race	Knowing	4	1.0	2	0.2	3.275	0.070
	Not knowing	384	99.0	814	99.8		
Skin	Knowing	1	0.3	1	0.1	0.290	0.590
	Not knowing	387	99.7	815	99.9		
Environmental factors	Knowing	144	37.1	247	30.3	5.617	0.018
	Not knowing	244	62.9	569	69.7		
Genetics	Knowing	133	34.3	217	26.6	7.532	0.006
	Not knowing	255	65.7	599	73.4		
<b>Total</b>		<b>388</b>	<b>100.0</b>	<b>816</b>	<b>100.0</b>		

**Table 3. The Knowledge and application of early diagnosis methods of students with and without cancer in family**

	Knowing early diagnosis methods		Not knowing early diagnosis methods		Applying early diagnosis methods		Not applying early diagnosis methods	
	n	%	n	%	n	%	n	%
<b>Mammography *</b>								
With cancer in family	90	41.1	233	32.9	11	91.7	312	34.1
Without cancer in family	129	58.9	475	67.1	1	8.3	603	65.9
	<b>X<sup>2</sup> = 4.937 p = 0.026</b>				<b>X<sup>2</sup> = 17.291 p = 0.000</b>			
<b>Breast self-examination (BSE)*</b>								
With cancer in family	62	41.3	261	33.6	37	39.4	286	34.3
Without cancer in family	88	58.7	516	66.4	57	60.6	547	65.7
	<b>X<sup>2</sup> = 3.320 p = 0.068</b>				<b>X<sup>2</sup> = 0.941 p = 0.332</b>			
<b>Pap-smear*</b>								
With cancer in family	83	48.0	240	31.8	23	46.0	300	34.2
Without cancer in family	90	52.0	514	68.2	27	54.0	577	65.8
	<b>X<sup>2</sup> = 16.159 p = 0.000</b>				<b>X<sup>2</sup> = 2.897 p = 0.089</b>			
<b>Clinical breast examination (CBE) *</b>								
With cancer in family	12	48.0	311	34.5	8	61.5	315	34.5
Without cancer in family	13	52.0	591	65.5	5	38.5	599	65.5
	<b>X<sup>2</sup> = 1.959 p = 0.162</b>				<b>X<sup>2</sup> = 4.139 p = 0.042</b>			
<b>X-ray**</b>								
With cancer in family	16	32.7	372	32.2	1	100.0	387	32.2
Without cancer in family	33	67.3	783	67.8	0	0.0	816	67.8
	<b>X<sup>2</sup> = 0.004 p = 0.948</b>				<b>X<sup>2</sup> = 2.105 p = 0.147</b>			
<b>Endoscopic examinations **</b>								
With cancer in family	13	44.8	375	31.9	2	100.0	386	32.1
Without cancer in family	16	55.2	800	68.1	0	0.0	816	67.9
	<b>X<sup>2</sup> = 2.161 p = 0.142</b>				<b>X<sup>2</sup> = 4.213 p = 0.040</b>			

\*Only the answers of female students were evaluated (n=927)

\*\*The answers of female and male students were evaluated (n=1204)

## DISCUSSION

In the study, it was determined that students with a family history of cancer were more knowledgeable about cancer risk factors and early diagnosis methods and applied early diagnosis methods such as mammography, clinical breast examination, and endoscopic examinations. Furthermore, the mean MBSS scores of students with a family history of

cancer was higher than those without a family history of cancer.

According to the 2020 data of GLOBOCAN, breast cancer ranks first in the incidence of female cancer, and lung cancer ranks first in the incidence of male cancer like Sudan and Turkey.<sup>2,3,10</sup> According to the study by Karasu et al., breast cancer is the most common cancer type among women in Turkey, as in all over the world.<sup>11</sup> This study elucidated that breast cancer ranked

first among students' female relatives and lung cancer ranked first among male relatives. Both worldwide and Turkey's sources support the research findings.<sup>2,3,10,11</sup>

Tobacco use is the most important risk factor for cancer and is responsible for about 22% of cancer deaths. Moreover, cancer-inducing viruses such as Hepatitis and Human Papilloma Virus (HPV) are responsible for 25% of cancer cases in low- and middle-income countries.<sup>1</sup> In the study by Merten et al. (2017), 99% of students stated that UV rays increased the risk of skin cancer, 99% expressed that smoking increased the risk of lung cancer, 86.0% reported that alcohol increased the risk of liver cancer, 82% asserted that HPV increased the risk of cervical cancer, and obesity increased the risk of CRC.<sup>12</sup>

In breast cancer, familial genetic predisposition is the main endogenous risk factors. The first of the unmodifiable risk factors in breast cancer is gender, and the second is age.<sup>13</sup> The fact that breast cancer was only seen in women and elderly grandmothers in this study is similar to the literature and research.

In the study by Imran et al. (2016), students from the medical faculty were more knowledgeable, and their level of awareness was better than non-medical students.<sup>14</sup> The study revealed that students with a family history of cancer were more knowledgeable about cancer risk factors such as diet/nutrition, genetic factors, environmental factors and smoking. The study findings support the literature review and research findings.<sup>1,12-14</sup>

There are three main elements in breast cancer screening: BSE, CBE performed by a physician, and mammography.<sup>11,13</sup> In the study by Şahin et al. (2015), the rates of undergoing sigmoidoscopy and colonoscopy were found to be significantly higher in the researchers whose family members were diagnosed with CRC. When the researchers were asked about the reasons for not having CRC screening, the first four reasons were stated as ignorance, not considering themselves at risk, fear of the result and lack of time.<sup>15</sup>

In the studies conducted on nursing and midwifery students, it was revealed that 90%-100% of students were knowledgeable about BSE, 12.1%-14.8% regularly applied BSE every month, 88.5%-90.9% never went for CBE, and 10.6% - 14.8% had a family history of breast cancer. Furthermore, as the reasons for not applying BSE, students mostly stated that they did not know how to apply BSE and did not apply BSE due to reasons such as forgetting it, not finding it necessary, fear of having an abnormal mass in the breast, finding it embarrassing, not being able to find time, and not caring.<sup>16,17</sup>

Considering the European Union countries, screening is generally started in the United Kingdom (UK), the

Netherlands, Norway, Finland and Denmark over the age of 50. Since breast cancer is more common in the premenopausal period (50%) in Turkey compared to western countries, mammography is performed every two years for all women between the ages of 40-69 in line with the country's circumstances.<sup>13</sup>

In the study by Imran et al. (2016) most students (82.3%) were stated to be aware of CRC. While only one-third of students (33.0%) were aware of the CRC screening test, most students (77.0%) expressed that they thought screening tests would be helpful in the early diagnosis of CRC.<sup>14</sup>

Special tests such as Pap-smear and HPV tests are used in the early diagnosis of cervical cancer.<sup>18</sup> Pap-smear is considered the most effective instrument for secondary prevention worldwide.<sup>10</sup>

In the study, students with a family history of cancer were more knowledgeable about and applied early diagnosis methods for cancer (Table 3). The research findings were in parallel with the literature. Since the study was conducted in the faculty of health sciences and 32.2% of the participating students had a family history of cancer, their knowledge about early diagnosis methods for cancer was slightly higher than that of the normal population (Table 1).

Studies investigating cancer behavioral of students studying in the faculty of health sciences using the MBSS could not be reached. Hence, MBSS findings were discussed within the research. Despite a statistically significant difference in the mean MBSS score of students with a family history of cancer compared to the mean MBSS score of students without a family history of cancer, it was observed that the increase in the number of family members with cancer did not have a statistically significant difference in terms of the mean MBSS score. This suggests that the increase in the number of family members with cancer is attributed to the genetic risk factor, which is an unmodifiable risk factor among cancer risk factors, as seen in Table 2. This case indicates that, as the number of family members with cancer increases, the individual moves away from seeking information and exhibits a fatalistic attitude. Furthermore, it is assumed that students with a family history of cancer think it is early for them to have cancer since they are young.<sup>9</sup>

## CONCLUSIONS

The study revealed that students with a family history of cancer were more knowledgeable about cancer risk factors and early diagnosis methods and applied early diagnosis methods such as mammography, CBE, and endoscopic examinations. Additionally, the mean MBSS scores of students with a family history of cancer were found to be high. This study has shown that students with a family history of cancer are more

knowledgeable about cancer risk factors and early diagnosis methods and apply early diagnosis methods compared to those who do not have a family history of cancer.

#### Author contributions

Study idea/design: NG, FA, MMK

Data collection: NG, MMK

Data analysis and interpretation: NG, MMK

Literature review: NG

Writing of the article: NG, FA

Critical review: NG

Final approval and responsibility: NG, FA

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