



## INVESTIGATION OF KNOWLEGE ABOUT PROSTATE CANCER SCREENING AND REGULAR EXERCISE AWARENESS IN MEN OVER 40 YEARS AGE ADMITTED TO HOSPITAL

### HASTANEYE BAŞVURAN 40 YAŞ ÜSTÜ ERKEKLERDE PROSTAT KANSERİ TARAMASI VE DÜZENLİ EGZERSİZ FARKINDALIĞINA İLİŞKİN BİLGİLERİN ARAŞTIRILMASI

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#### Öz

**Amaç:** Bu çalışmanın amacı; 40 yaşının üstündeki erkeklerde kanserden koruyucu bir etken olan düzenli egzersize ait bilinç düzeyinin ve prostat kanseri taramaları bilgisinin incelenmesidir.

**Materyal ve Metot:** Çalışma, prospektif olarak yürütüldü. Hastanemize başvuran 40 yaşının üstündeki erkeklerin demografik veri formunu, ‘Prostat Kanseri Taramaları Bilgi Testi (PKTBT)’ni ve ‘Egzersiz/Fiziksel Aktivite Bilinç Düzeyi Anketi’ni cevaplaması istendi.

**Bulgular:** Çalışmaya, yüz seksen bir erkek dahil edildi. PKTBT’nden alınan ortalama puan  $3.8 \pm 2.6$  olarak tespit edildi. Aile öyküsü pozitif olan kişilerin tarama bilgi testinden aldığı puanlar daha yüksekti ( $p=0.002$ ). Eğitimin artması tarama testi bilgisini artırıyordu ( $p<0.05$ ). Tarama testi bilgisi düşük olanlar, tarama programlarına daha az katılıyordu ( $p<0.05$ ). Sağlık-Egzersiz/Fiziksel Aktivite Bilinç Düzeyi Anketi’nden alınan ortalama puanın  $106.3 \pm 27.2$  olduğu bulundu. Kırsalda yaşayanların fiziksel aktivite bilinç düzeyi daha düşük iken eğitim arttıkça fiziksel aktivite alışkanlığı artıyordu ( $p<0.05$ ). Tarama testi bilgisi yüksek olanların hem fiziksel aktivite bilinci hem de alışkanlığı daha yüksekti ( $p<0.05$ ).

**Sonuç:** Sonuç olarak 40 yaş üstü erkeklerin prostat kanseri tarama testleri hakkında düşük düzeyde, egzersiz / fiziksel aktivite farkındalığı konusunda orta düzeyde bilgiye sahip oldukları belirlenmiştir. Toplumda, prostat kanserin erken tanısını kolaylaştıran tarama testleri bilgisi artırılırken bir yandan da sağlıklı yaşam alışkanlıkları konusunda bilgi ve alışkanlık düzeyinin artırılması gerekmektedir.

**Anahtar kelimeler:** Egzersiz, fiziksel aktivite, prostat kanseri, tarama

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## Abstract

**Aim:** In this study, we aimed to examine level of awareness of regular exercise, which is a protective factor from cancer, and knowledge about prostate cancer screening (PCaS) in men over 40 years of age.

**Material and method:** The study was conducted prospectively. Men over 40 years of age who applied to our hospital were asked to answer the demographic information form, "PCaS Test", and "Exercise/Physical Activity Awareness Level Questionnaire (E/PAALQ)".

**Results:** One hundred eighty-one men were included in this study. The mean score obtained from PCaS Test was  $3.8 \pm 2.6$ . Individuals, who had a positive family history, obtained higher scores from PCaS ( $p=0.002$ ). The increase in the level of education was increasing the level of knowledge about PCaS ( $p<0.05$ ). Individuals, who had low level of knowledge about screening test, were participating less in screening programs ( $p<0.05$ ). The mean score obtained from E/PAALQ was  $106.3 \pm 27.2$ . While the level of the physical activity awareness of the rural residents was lower, physical activity habit increased as the level of education increased ( $p<0.05$ ). In individuals with high level of knowledge about screening test, both awareness and habit of physical activity were higher ( $p<0.05$ ).

**Conclusion:** As a result, it was determined that men over the age of 40 have low-level of knowledge about prostate cancer screening tests and have moderate-level knowledge about exercise/physical activity awareness. In society, while increasing knowledge of screening tests that facilitate early diagnosis of prostate cancer, knowledge and habit level should be increased on subject of healthy living habits also.

**Keywords:** Exercise, physical activity, prostate cancer, screening.

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## Introduction

Cancer is the second most common cause of death after cardiovascular diseases<sup>1</sup>. Prostate cancer is the most frequently diagnosed cancer, and it ranks second among all malignant neoplasms<sup>2,3</sup>. According to the data in our country, the incidence of prostate cancer is 35-37.6 / 100000<sup>3,4</sup>. This number demonstrates that 28% of the male cancer cases in our country are diagnosed with prostate cancer, and prostate cancer is the second most common type of cancer in men<sup>3,4</sup>. When the figures of the current cancer incidence are projected to 2050, it is predicted that the incidence of cancer will increase by 3 times<sup>5</sup>. Fortunately, prostate cancer has a slowly progressive nature<sup>6</sup>. It is possible to diagnose in the early stage with screening tests, and the eradication success of prostate cancer detected at an early stage is high<sup>4,7</sup>.

Upon examining the literature, it is observed that the main factors causing the development of prostate cancer and/or preventing early diagnosis are listed as advanced age, positive family history, black race, unhealthy eating habits, lack of exercise, smoking, excessive alcohol consumption, obesity, low socioeconomic status, lack of knowledge about the disease, low level of education, lack of health insurance, difficulty in access to healthcare institutions, geographical region, genetic mutations and some occupational groups exposed to carcinogenic substances<sup>1,8-11</sup>. In non-communicable diseases such as cancer, the main goal should be to intervene in the risk factors that can be modified and to provide primary protection<sup>12,13</sup>. Developing the levels of knowledge/awareness about protective health and physical activity habits are thought to be the main factors that can be intervened.

The protective effect of physical activity on prevention of cancer development and progression originates from its effect on

the sex hormones, insulin, insulin-related growth factor (IGF), adipokine signal, and the mechanisms on inflammatory pathways<sup>7,14,15</sup>. In fact, while regular physical activity decreases the levels of sex hormone, insulin and IGF-1 in serum, it increases the levels of IGF-binding protein 1 and sex hormone binding globulin<sup>7,8,15</sup>. Thus, proliferation in prostate cells decreases and apoptosis in prostate tumor cells increases<sup>7,15</sup>. Adipokine supports tumor development with the presence and effect of obesity<sup>7,12,15</sup>. Regular exercise plays a preventive role in the development of cancer with its protective effect from obesity and the balancing effect on adipokine levels and chronic inflammatory processes<sup>7,12,15</sup>. Epidemiological studies confirm that increased physical activity decreases prostate cancer risk by 10-30%<sup>10,12</sup>.

The benefits of the exercise are not only primary protection from prostate cancer. Aerobic exercise, applied to patients diagnosed with prostate cancer and receiving treatment, has also positive contributions such as reducing cancer-related fatigue, increasing quality of life, preserving and developing muscle strength<sup>7,16,17</sup>. Physical activity at high levels leads to a reduction in prostate cancer-specific mortality rate<sup>7</sup>. Especially, the disease recurrence risk of patients with breast, colon, and prostate cancer decreases depending on exercise<sup>14</sup>. All this information suggests that the level of exercise awareness should be increased in order to provide primary, secondary and tertiary protection from cancer<sup>12</sup>.

Another suggestion of specialist organizations seeking with cancer to provide protection from cancer is to increase the level of knowledge of society about cancer screening programs<sup>8</sup>. In our country, when men over 40 years of age with a family history and men over 50 years of age without a family history apply

to the healthcare facility for prostate cancer screening, Prostate-Specific Antigen (PSA) measurement and digital rectal examination are performed<sup>3,8</sup>. However, it is known that participation rates in prostate cancer screening programs in our country are low<sup>18</sup>. Especially in cancers in which early diagnosis with a serological marker is possible, such as prostate cancer, it is evident that the participation in cancer screening programs affects the level of knowledge of society about this subject<sup>8,19,20</sup>.

The lack of knowledge/awareness is known to be a hindrance to maintaining a healthy lifestyle, gaining exercise habits and providing participation in cancer screening. We also observe that the protective effect of exercise against cancer is not known by society. The aim of this study is to examine the level of awareness of regular exercise, which is a factor that protects from cancer, and the knowledge about prostate cancer screenings, in men over 40 years of age.

## Materials and Methods

It was determined that the research results should reach 181 participants in order to reflect the population at 80% confidence level (and precision rate 0.05). Men, who came our hospital in order to be examined and/or treated for any reason, whose ages ranged between 40-80 years and who were literate, constituted the population of the prospectively designed study. Men under 40 years of age and men over 80 years of age, and individuals with whom communication problems were experienced during the implementation of questionnaires were excluded from the study.

The participants were asked to answer the demographic data form prepared by the researchers<sup>19,21-24</sup>, the "Prostate Cancer Screening Knowledge (PCaS) Test"<sup>19</sup>, and

the "Exercise/Physical Activity Awareness Level Questionnaire (E/PAALQ)"<sup>25</sup>. The participants were given the necessary time to ask questions and to share on the subject.

The study was approved by the decision of the local ethics committee numbered 138 dated 16/04/2019.

### ***Statistical analysis***

The Pearson chi-square and likelihood chi-square methods were used for the independence test. Prior to analysis, the normal distribution test was performed using the Shapiro-Wilk method. In order to determine whether there was a

difference between the score averages the one-way ANOVA method was applied within the framework of general linear models. Kruskal-Wallis test method was used to compare prostate cancer knowledge level scores with other variables. All analyses were performed using SAS 9.4 (SAS Inst., 2019) version. Statistical significance level was accepted as  $p < 0.05$ . Data were presented as % (n) and mean  $\pm$  standard deviation.

**Table 1. Sociodemographic characteristics of the participants**

<b>Sociodemographic characteristics</b>	<b>%</b>	<b>n</b>
Educational Status		
Literate	1.1	2
Elementary School	23.8	43
Secondary School	14.9	27
High School	27.6	50
Associate Degree	9.4	17
Undergraduate (Faculty / College)	21	38
Graduate	1.7	3
Doctorate	0.5	1
Working Status		
Works full-time	62.4	113
Works part-time	2.8	5
Does not work	2.2	4
Retired but works full-time or part-time	3.3	6
Retired	29.3	53
Professional Status		
Public servant	37.1	66
Worker	33.7	60
Self-employed	29.2	52
Level of Income		
Income is less than the expenses	27.12	48
Income is equal to the expenses	63.3	112
Income is more than the expense	9.6	17

**Table 2. The participants' healthy life habits and disease histories**

Healthy life habits and history of disease	%	n
Smoking status		
Never smokes	30.5	55
Still smokes	33.9	61
Has given up smoking	35.6	64
Experiencing any problems/diseases related to prostate		
No	84	152
Yes (Benign prostatic hyperplasia, prostatitis, other)	16	29
Prostate cancer history in the family		
No	88.4	159
Himself	2.2	4
First-degree relative	5	9
Second-degree relative	2.2	4
Third-degree relative	2.2	4
Digital rectal examination habit		
Never	77.1	138
Once in a six month	4.4	8
Once in a year	8.4	15
Once in two years	1.7	3
At irregular intervals	8.4	15
PSA measurement habit		
Never	74.3	133
Once in a six month	3.9	7
Once in a year	11.7	21
Once in two years	0.6	1
At irregular intervals	9.5	17

PSA: Prostate-Specific Antigen

## Results

One hundred eighty-one men were included in this study. The average age of the participants was  $52 \pm 9.2$  years, the average height was  $172 \pm 6.7$  cm, the average body weight was  $81 \pm 13$  kg, and the average body mass index was  $27 \pm 4.1$  kg/m<sup>2</sup>. Of the individuals included in the study, 95.6% (n = 172) were married. Of the participants, 65.2% (n = 118) lived in the city center, 20.4% (n = 37) lived in the district, and the remaining 14.4% (n =

26) lived in the village. It was found out that most of the participants graduated from high school, worked full-time, and had health insurance (Table 1).

Smokers constituted 33.9% (n = 61) of the participants. Of the participants, 31.8% (n = 57) had at least one chronic disease and were using medication to treat their chronic disease. The individuals, who reported to have previously experienced any disease related to the prostate gland, constituted 16% (n = 29) of the cases (Table 2). Of the participants, 88.4% (n =

159) had no prostate cancer history in their background and family history. The prevalence of any disease related to the prostate gland (20%) was higher in the background of patients without health insurance ( $p = 0.0001$ ). The rate of having a history of any prostate gland related disease other than prostate cancer (3.5%) was found to be lower in individuals living in the village ( $p = 0.04$ ).

The mean score obtained from the "PCaS Test" was  $3.8 \pm 2.6$ . Of the participants, 92.3% were knowledgeable at a low level and 7.7% were knowledgeable at a moderate level. It was found out that the residents of the district had relatively more knowledge scores on prostate cancer screenings ( $p = 0.003$ ). The scores received from the "PCaS Test" by individuals with a positive family history were higher ( $p = 0.002$ ).

Three-quarters of men over the age of 40 had never been screened for prostate cancer before. The rate of participation in the screening programs of individuals who received a low score from the screening test was lower ( $p < 0.001$ ). Individuals, who most frequently participated in the digital rectal examination, were found to be district residents ( $p = 0.002$ ). A family history of prostate cancer was increasing participation in both the digital rectal examination and PSA measurement ( $p < 0.05$ ). A significant relationship was found between the habits of having the PSA measurement made in the blood for prostate cancer screening and the education level ( $p = 0.001$ ). While the habit of having PSA measurements made was the lowest in secondary school graduates (7.4%), it was observed that the habit increased as the education level increased.

Of the participants, 16% ( $n = 29$ ) thought that they had enough knowledge about prostate cancer. The presence of a prostate cancer history in the family led people to

express themselves as more knowledgeable ( $p < 0.05$ ). Of the individuals who thought that they were knowledgeable about prostate cancer, 35.1% acquired this knowledge from doctors, nurses or other healthcare personnel, while 21.2% stated that they acquired it from their family members and friends. The rate of individuals, who gained awareness through the internet and social media, which are very popular nowadays, was about 14.9%.

Of the participants, 55.4% ( $n = 79$ ) thought that they had enough knowledge about exercise/physical activity. When all the data were evaluated, the mean score obtained from the "E/PAALQ" was determined to be  $106.3 \pm 27.2$ . Most of the individuals, who stated that they did not have enough knowledge about exercise/physical activity, lived in city centers ( $p = 0.01$ ). However, the individuals who received the lowest score from the "E/PAALQ", lived in the village ( $p = 0.004$ ). Furthermore, the average score obtained from this questionnaire by individuals with health insurance was higher ( $p = 0.02$ ).

The knowledge acquisition resources of individuals who believed that they were sufficiently knowledgeable about exercise/physical activity were in parallel with individuals who thought they had sufficient knowledge about prostate cancer. When the data were examined, the rate of individuals who indicated doctors, nurses or healthcare personnel as their source of knowledge was 28.9%, and the rate of individuals acquired knowledge from their friends and family was 26.6%. While the rate of individuals acquired knowledge about the subject from written or visual media was 18%, the rate of individuals stating social media and the internet as the knowledge resource was 16.4%. It was determined that the education level of the participants made a difference in the ways of obtaining

knowledge ( $p < 0.0001$ ). While individuals with lower levels of education frequently regarded family/friends as the knowledge acquisition resource, individuals with especially undergraduate and higher education level frequently used written and visual communication tools.

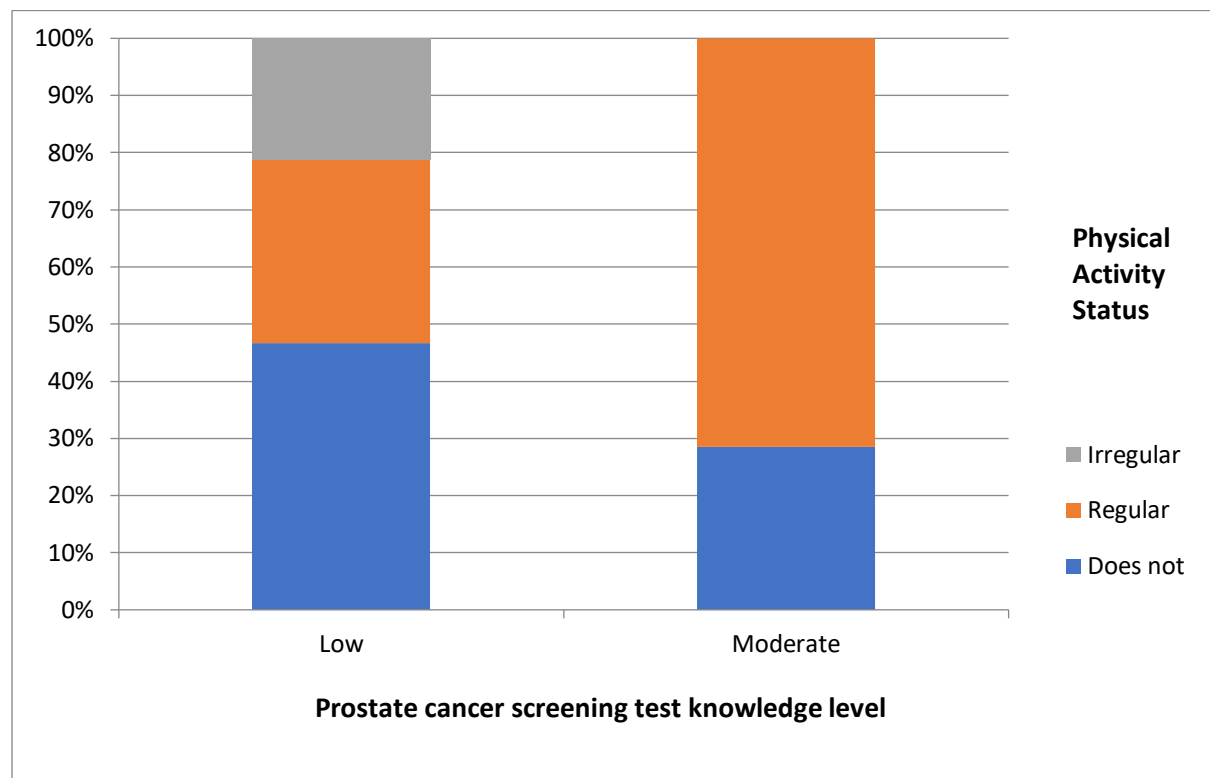
The rate of individuals who were doing regular physical activity for 3-5 days in a week and at least for half an hour and over was 35.3% ( $n = 63$ ) while the rate of those who stated that they exercised at irregular intervals was 19.6% ( $n = 35$ ). The increase in the level of education caused an increase in physical activity habits ( $p = 0.04$ ).

Individuals, who had a relatively higher level of knowledge about prostate cancer

screening test, had a higher level of knowledge about exercise and habit of exercising regularly ( $p < 0.05$ ), (Graph 1).

Of the participants, 38.1% ( $n = 69$ ) answered the question "Does regular exercise prevent cancer development?" as "Yes", and 8.3% ( $n = 15$ ) as "No" and 53.6% ( $n = 97$ ) as "I do not know." When the participants were asked the question "In which types of cancer exercise can play a preventive/protective role?", the rate of individuals who thought that exercise could prevent all kinds of cancer was in the first rank with 27.1%. They were followed by individuals who thought that exercise prevented lung cancer (16.7%) and prostate cancer (6.3%).

**Graph 1. Distribution of the physical activity habit according to the prostate cancer screening test knowledge level**



## Discussion

According to the data we obtained, the society's level of knowledge about prostate cancer screening tests and participation in screening programs are low. The main factors that affect the level of knowledge and positively participation in screening programs are the positive family history and the level of education. Factors that complicate the access to healthcare providers such as the lack of health insurance and living in rural areas change the incidence of prostate gland diseases. However, the effect of these factors on the prostate cancer knowledge level and on the participation in screening programs is not significant. Individuals with a higher level of knowledge about the screening test and with a higher level of education were determined to have higher exercise awareness levels and habits. This can be considered as an indicator of increased general healthy living awareness in these people. However, it was determined that society lacks the knowledge and behavior which state that exercise can protect from cancer.

Increasing the level of knowledge about cancers having screening tests is very important in terms of public health<sup>19</sup>. Studies conducted in our country show that society does not have enough knowledge about prostate cancer screenings<sup>3,24</sup>. In the study by Arlı et al.<sup>3</sup>, the rate of individuals with low level of knowledge was 93.7% and the mean knowledge score was  $4.05 \pm 2.14$ . In the study by Ceyhan et al.<sup>24</sup>, the mean knowledge test score was  $4.81 \pm 2.24$ , and it was emphasized that the level of knowledge of the society was low. According to the data we obtained in our study, the fact that there was no one who had knowledge of prostate cancer screening at a high level in our sample group suggested that awareness should be definitely raised in the society in this regard.

In the study by Çapık<sup>18</sup>, factors influencing screening test knowledge were reported to be the level of education, previous participation in the screening test, the presence of the positive family history, and the presence of health insurance. Arlı et al.<sup>3</sup> reported that the increase in age decreased the level of knowledge. Ceyhan et al.<sup>24</sup> reported that the scores of individuals, who had previously received knowledge about screening tests, were higher. Mofolo<sup>23</sup> reported that the low level of education, black race, and not knowing the language spoken in the country would be related to screening test knowledge. In our study, it was determined that this issue was related only the presence of prostate cancer history in the family PCaS.

According to the literature, low level of knowledge about screening test is a factor reducing the participation in screening programs<sup>20,24</sup>. The results obtained in our study were also in this direction. While individuals with low level of knowledge about screening participate less in screening programs, the rate of participation in these programs increases as the level of education increases and when the family has a history of cancer.

Zare et al.<sup>20</sup> state that society's PCaS can be increased through Health Belief Model-Based Education programs and individuals who have more knowledge will participate in screening programs. We believe that participation in screening programs, which offer the possibility of early diagnosis, should be increased by increasing the level of knowledge about screening in our society.

Prostate cancer is a cancer type which can be diagnosed early and of which risk can be reduced when regular exercises are done and healthy living habits are applied<sup>12</sup>. Morrison et al.<sup>8</sup> reported that Jamaican men had moderate levels of PCaS. However, factors such as healthy



eating habits and regular exercise participation, which can be modified and which are protective against prostate cancer, were stated not to be implemented mostly. Unfortunately, the results we obtained in our study were more negative because, while Morrison et al.<sup>8</sup> reported that the rate of individuals who did not exercise regularly was 35%, in our study, the rate of individuals, who stated that they did exercise regularly, was determined to be 35.3%.

Social media digital platforms and other means of communication are extremely popular nowadays as a source of knowledge on health-related issues<sup>22, 26</sup>. Merten et al.<sup>1</sup> stated in the study, in which they examined the level of knowledge about the factors creating cancer risk in young men, that the increase in the level of education caused an increase in the use of the internet as a source of knowledge. In our study, it was determined that the increase in the level of education provided the acquisition of exercise knowledge from written and visual communication tools. From this point of view, we think that especially in communities which are young and have higher education level, written and visual communication tools, which include the Internet, can be benefited from in order to improve the awareness of exercise, to teach cancer screening programs and to improve public health.

When we handle healthy living habits as a whole, as in cancer screening test knowledge, an increase also in the level of knowledge about exercise and physical activity leads to the increase in physical activity habit<sup>25</sup>. The data we obtained in our study were also in this direction. It is necessary to educate all individuals in our society to develop their healthy lifestyle habits, and this knowledge should be transformed into a habit.

In the literature, it is often mentioned that exercise is protective against cancer<sup>27</sup>. However, the awareness level of this knowledge is low. For example, while students of faculties of medicine have the knowledge that physical activity is protective in chronic diseases such as coronary heart disease, hypertension, and hypercholesterolemia, they have limited knowledge about cancer<sup>5</sup>. In our study, it was determined that the knowledge about the fact that exercise could be protective against cancer was insufficient. Furthermore, it was identified that individuals, who thought that exercise was protective against cancer, could not define its relation with cancer types, such as breast, colon, etc. in which the protective effect of exercise was high<sup>5</sup>.

## Conclusion

As a result, it was determined that men over the age of 40 have low-level of knowledge about prostate cancer screening tests and have moderate-level knowledge about exercise/physical activity awareness. It was identified that most of the participants did not know that exercise was protective against cancer. Therefore, in society, while increasing the knowledge of screening tests that facilitate the early diagnosis of cancer, on the other hand, the knowledge and habit level should be increased on the subject of healthy living habits such as an increase in physical activity which is preventive of cancer.

## Conflict of Interest

The authors declare that they have no conflict of interest

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None

## Ethical Approval

Ethical approval received from the Ethics Committee of Suleyman Demirel University Faculty of Medicine. (18.04.2019-2867572.050.01.04)

All participants were informed about the aims and the methods of the study and afterward they have signed the informed consent.

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