The effect of testicular cancer and testicular self-examination on knowledge, attitude and health beliefs in university students in Turkey

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Abstract

Purpose – This research was planned and applied as a descriptive study in order to determine the knowledge, attitudes and behaviors about testicular cancer (TC) and testicular self-examination (TSE) of male students who receiving health education.

Design/methodology/approach – This descriptive and cross-sectional study was conducted between May and August 2019 with male students. Early diagnosis of TC is quite important in terms of prognosis of the disease. The data were collected by using the questionnaire prepared by the researchers in accordance with the literature and the Turkish version of health belief model scale (HBMS) for TSE. The data were analyzed by number, percentage, mean and standard deviation and t test.

Findings – TSE HBMS, it was observed that the mean score of susceptibility subscale was 11.23 ± 3.73, the mean score of seriousness subscale was 28.20 ± 7.66, the mean score of benefit subscale was 21.57 ± 5.90, the mean score of the barriers subscale was 22.74 ± 5.16, the mean score of self-efficacy subscale was 9.91 ± 3.13 and the mean score of the health motivation subscale was 8.92 ± 2.84.

Originality/value – There was a statistically significant relationship between having heard of TC and health motivation ($p < 0.05$). There was a statistically significant relationship between the knowledge of TC and self-efficacy and health motivation ($p < 0.05$). There was a significant relationship between self-efficacy and TSE performing status ($p < 0.05$). There was also a significant relationship between the desire to obtain information about TSE and seriousness, barriers, self-efficacy and health motivation ($p < 0.05$). It was determined that majority of university students did not have any information about TC and TSE.

Keywords Testicular cancer, Testicular self-examination, Turkey

Paper type Research paper

Introduction

The testicles are internal genital organs and are involved in the production of spermatozoon which is the reproductive cell in males [1]. Testicular cancer (TC) begins with a change in normal testicular tissue and uncontrolled growth and forms a tumor. Germ cell tumor

develops in the sperm-producing cell and is the most common type of TC by 95%. Swelling without pain, dull pain in the scrotum and a feeling of weight are the most common testicular tumor symptoms [2].

Epidemiological risk factors for the development of TC can be listed, respectively, as cryptorchidism or undescended testicle history, Klinefelter Syndrome, testicular tumor history of first-degree relatives (sibling, father), the presence of a contralateral testicular tumor or testicular intraepithelial neoplasia and infertility [3–6].

TC incidence varies from <1 affected individuals per 100,000 males in large parts of Africa and Asia, 9.9 affected individuals per 100,000 males in Norway, 9.4 affected individuals per 100,000 males in Denmark and 9.2 affected individuals per 100,000 males in Switzerland [7]. In the United States, TC is more common amongst White individuals (6.9 affected individuals per 100,000 males)[8]. The incidence of TC is increasing worldwide, but the reasons for this increase have not been well-documented [9]. The incidence of TC in Turkey is 1.3% [10]. Although the incidence of TC seems to be low, its incidence has doubled in the last forty years [11]. Early diagnosis of TC is quite important in terms of the prognosis of the disease. The five-year survival rate in early-stage increases up to 95% [2, 6, 12]. If the TC is in stage 1, then that means that the cancer is only in the testicles and the survival rate is very high. The survival rate is significantly lower in males diagnosed in stages 3 and 4 [13].

According to the literature, causes of delay in diagnosis and treatment include lack of knowledge among young males about the danger and symptoms of TC and testicular self-examination (TSE) which is important for early diagnosis, not caring about the examination due to feelings such as guilt and sin and delays in visiting a physician [13]. TC cannot be prevented, but the important way to diagnose TC early is to perform TSE regularly [14].

Therefore, individuals need to be conscious and perform TSE for early diagnosis [15]. Monthly routine of TSE has advantages such as easy learning and application, no additional costs, no invasiveness and no lengthy waiting times. In addition, the recognition of testicular tissue provides benefits in the early detection of possible changes [16, 17]. Male students receiving health education are at risk of TC in terms of age group [16]. This research was applied as a descriptive study in order to determine the knowledge, attitudes and behaviors about TC and TSE of male students who receive health education.

Methodology
Study design and setting
This descriptive and cross-sectional study was conducted between May and August 2019 with male students studying at Selcuk University. The sample of the study consisted of 360 volunteer students who filled in the informed consent form.

Instruments/data collection
The data were collected by using the questionnaire prepared by the researchers in accordance with the literature and the Turkish version of the Health Belief Model Scale (HBMS) for TSE. The questionnaire consisted of two parts: (1) questions with descriptive information, (2) information and practices related to TC and TSE [10, 18, 19]. The Turkish version of HBMS included six subscales: (1) susceptibility, (2) seriousness, (3) benefits, (4) barriers, (5) self-efficacy and (6) health motivation. The scale was a Likert-type scale that was scored from 1 to 5, and the answers to the scale were scored as "strongly agree = 5; agree = 4; undecided = 3; disagree = 2 and strongly disagree = 1". The scale did not have a total score. Each subscale score was

calculated separately. High scores indicated a positive status for susceptibility, seriousness, benefits, self-efficacy and health motivation, while high scores in the barriers subscale indicated a negative status [18].

The data were collected at a convenient time in the students' classes. Before starting the research, the students were first informed about the research and introduced to the data collection instruments. The students were then given data collection instruments and asked to fill these out. The average data collection time for each student lasted 10–15 min.

Data analysis
In the analysis of the data, IMP SPSS 16.0 software was used. Number, percentage, mean and standard deviation and *t*-test was used to evaluate the data.

Ethical consideration
Approval was obtained from the relevant ethics committee before the study (Ethics committee Decision No. 2019/127).

Results

The ages of the students ranged from 18 to 30 years with an average age of 20.43 ± 1.87. It was determined that 63.3% of the students did not have romantic relationships. 51.9% of the students had never heard of TC before and 86.9% of them did not know about testicular cancer. The students who stated that they received information about TCr received the most information from the media (5.6%) and secondly from conferences/panel discussions (4.2%). About 90.6% of the students participating in the study had not heard of TSE before, only 5.8% knew how to perform TSE. 3.9% of the students were performing TSE and 91.9% knew the importance of TSE in the early diagnosis of TC. 78.9% of the students stated that they wanted to get information about TC and performing TSE (Table 1).

A total of 81.7% of the students stated that they did not know that TC was seen in males aged 15–35 years, 82.5% of them had no information about the undescended testicles which is the greatest risk group for TC, 55.6% did not know that the chance of healing from TC can go up to 80–90% with early diagnosis, 62.2% of the students had no information about the fact that the early diagnosis method in TC is TSE, 80.6% of the students did not know the necessity of TSE in the shower or right after the shower, 70.6% of the students had no information about the fact that TSE should be performed regularly every month and 77.8% did not know that it should be done every month at specific times. Most of the students had no information about the symptoms of TC (Table 2).

In the TSE health belief model scale, it was observed that the mean score of susceptibility subscale was 11.23 ± 3.73, the mean score of seriousness subscale was 28.20 ± 7.66, the mean score of benefit subscale was 21.57 ± 5.90, the mean score of the barriers subscale was 22.74 ± 5.16, the mean score of self-efficacy subscale was 9.91 ± 3.13 and the mean score of the health motivation subscale was 8.92 ± 2.84 (Table 3).

The relationship between TC and mean subscale scores of the TSE health belief scale was examined. There was a statistically significant relationship between having heard of TC and health motivation ($p < 0.05$). There was a statistically significant relationship between the knowledge of TC and self-efficacy and health motivation ($p < 0.05$). There was a significant relationship between self-efficacy and TSE performing status ($p < 0.05$). There was also a

Descriptive characteristics		Number	%
Age	$X \pm SD = 20.43 \pm 1.87$ (min = 18, max = 36)		
Marital status	Dating	95	26.4
	Engaged	20	5.6
	Married	17	4.7
	No relationship	228	63.3
Academic year	1st year	97	26.9
	2nd year	95	26.4
	3rd year	77	21.4
	4th year	91	25.3
Have you ever heard of TC before?	Yes	173	48.1
	No	187	51.9
Does anyone in your family have TC?	Yes	3	0.8
	No	357	99.2
Is there anyone in your close environment (friends, neighbors, etc.) diagnosed with TC?	Yes	6	1.7
	No	354	98.3
Do you know anything about TC?	Yes	47	13.1
	No	313	86.9
Where did you get information on TC? (n: 47)	Health professional	12	3.3
	Media	20	5.6
	Conference\panels	15	4.2
Have you heard of TSE?	Yes	34	9.4
	No	326	90.6
Do you know how to perform TSE?	Yes	21	5.8
	No	339	94.2
Do you perform TSE?	Yes	14	3.9
	No	346	96.1
How often do you perform TSE? (n: 14)	Monthly regular	3	0.8
	Irregular	11	3.1
Would you like to receive information about TSE?	Yes	284	78.9
	No	76	21.1
Is TSE important in the early diagnosis of TC?	Yes	331	91.9
	No	29	8.1

Table 1.
Sociodemographic
characteristics of
students participating
in the study (n: 360)

Information	I know n (%)	I don't know n (%)	I'm not sure n (%)
TC is most common in males aged 15–35 years	44 (12.2)	294 (81.7)	22 (6.1)
The greatest risk group for TC is those with undescended testicles	39 (10.8)	297 (82.5)	24 (6.7)
Early diagnosis increases the chance of recovery from TC to 80–90%	120 (33.3)	200 (55.6)	40 (11.1)
The earliest diagnostic method in TC is TSE	90 (25.0)	224 (62.2)	46 (12.8)
TSE should be performed in the shower or immediately after the shower	41 (11.4)	290 (80.6)	29 (8.1)
TSE should be done regularly every month	65 (18.1)	254 (70.6)	41 (11.4)
TSE is checked at a certain time each month	50 (13.9)	280 (77.8)	30 (8.3)
TSE is performed by gently checking the testicles between the fingers	57 (15.8)	269 (74.7)	34 (9.4)
During the examination, it is tried to feel if there is any mass (tuber) in the testicles and on the edges	72 (20.0)	256 (71.1)	32 (8.9)
Normally one of the testicles may be slightly smaller than the other	110 (30.6)	218 (60.6)	32 (8.9)
In TC, the mass is usually found on the back of the testicle	28 (7.8)	310 (86.1)	22 (6.1)
Where there is TC, there are signs of lump/mass, pain, weight loss, hair loss, general swelling and rash in the testicular sac	54 (15.0)	284 (78.9)	22 (6.1)
Problems with sexual intercourse occur in TC cases	59 (16.4)	268 (74.4)	33 (9.2)
Blood in the urine, pain and burning while urinating are signs of TC	57 (15.8)	267 (74.2)	36 (10.0)

Table 2.
Students' level of
knowledge about TC
and TSE (n: 360)

significant relationship between the desire to obtain information about TSE and seriousness, barriers, self-efficacy and health motivation ($p < 0.05$) (Table 4).

Discussion

The mean age of the participants was 20.43 ± 1.87. According to the literature reviews, this age group is in the risk group for TC [16, 20, 21]. Of the students who participated in our study, 90.6% had not heard of TSE before. Similar to our study, 48.3% of the participants did not hear of TSE in the study of Göçgeldi and Koçak [10] and 39.1% of the participants did not hear of TSE in the study of Yılmaz *et al.* [16]. A total of 56% of the participants in Ugurlu *et al.*'s study did not hear of TSE [14]. In Gutema *et al.*'s study, it was reported that 24% of the participants did not hear of TC [22]. A total of 57.6% of Altınel and Avci's research group stated that they had heard of TC [23], while this rate was 23.3% in Göçgeldi *et al.* [24].

Sub-scales	Min–max	Mean $\pm$ SD
Susceptibility	5–24	11.23 ± 3.73
Seriousness	10–48	28.20 ± 7.66
Benefit	6–63	21.57 ± 5.90
Barriers	9–42	22.74 ± 5.16
Self-efficacy	4–20	9.91 ± 3.13
Health motivation	3–15	8.92 ± 2.84

Table 3.
The mean scores of the subscale of the students' TSE health belief model scale (*n*: 360)

Group	Susceptibility $X \pm$ SD	Seriousness $X \pm$ SD	Benefit $X \pm$ SD	Barriers $X \pm$ SD	Self-efficacy $X \pm$ SD	Health motivation $X \pm$ SD
Have you ever heard of TC before?						
Yes	11.46 ± 3.50	28.58 ± 7.28	21.87 ± 5.19	23.27 ± 5.02	10.13 ± 3.15	9.27 ± 2.69
No	11.01 ± 3.93	27.85 ± 8.01	21.29 ± 6.49	22.25 ± 5.26	9.72 ± 3.11	8.59 ± 2.94
	$t = 1.138$	$t = 0.903$	$t = 0.929$	$t = 1.872$	$t = 1.242$	$t = 2.262$
	$p = 0.256$	$p = 0.367$	$p = 0.353$	$p = 0.062$	$p = 0.215$	$*p = 0.024$
Do you know anything about TC?						
Yes	11.57 ± 3.56	28.36 ± 8.22	22.51 ± 4.88	22.97 ± 6.00	11.31 ± 3.33	10.19 ± 2.64
No	11.17 ± 3.76	28.18 ± 7.59	21.43 ± 6.03	22.70 ± 5.03	9.70 ± 3.05	8.73 ± 2.82
	$t = 0.704$	$t = 0.141$	$t = 1.358$	$t = 0.292$	$t = 3.122$	$t = 3.498$
	$p = 0.484$	$p = 0.888$	$p = 0.179$	$p = 0.771$	$*p = 0.003$	$*p = 0.001$
Do you know how to perform TSE?						
Yes	10.90 ± 3.93	26.52 ± 9.97	21.95 ± 5.49	22.71 ± 7.40	11.71 ± 3.84	9.80 ± 3.29
No	11.25 ± 3.72	28.30 ± 7.50	21.55 ± 5.93	22.74 ± 5.01	9.80 ± 3.06	8.86 ± 2.81
	$t = -0.392$	$t = -0.806$	$t = 0.320$	$t = -0.028$	$t = 2.226$	$t = 1.282$
	$p = 0.699$	$p = 0.429$	$p = 0.752$	$p = 0.978$	$*p = 0.037$	$p = 0.213$
Do you perform TSE?						
Yes	11.14 ± 3.97	29.21 ± 9.25	22.64 ± 4.36	22.64 ± 7.99	12.07 ± 3.85	10.00 ± 2.60
No	11.23 ± 3.73	28.16 ± 7.61	21.53 ± 5.96	22.74 ± 5.03	9.83 ± 3.08	8.87 ± 2.84
	$t = -0.084$	$t = 0.419$	$t = 0.917$	$t = -0.075$	$t = 2.147$	$t = 1.575$
	$p = 0.934$	$p = 0.682$	$p = 0.374$	$p = 0.940$	$*p = 0.050$	$p = 0.137$
Would you like to receive information about TSE?						
Yes	11.30 ± 3.72	28.63 ± 7.32	21.90 ± 6.05	22.30 ± 5.05	9.69 ± 3.04	8.73 ± 2.81
No	10.93 ± 3.79	26.60 ± 8.69	20.35 ± 5.16	24.38 ± 5.28	10.75 ± 3.34	9.60 ± 2.87
	$t = 0.769$	$t = 2.057$	$t = 2.238$	$t = -3.066$	$t = -2.483$	$t = -2.345$
	$p = 0.444$	$*p = 0.040$	$*p = 0.027$	$*p = 0.003$	$*p = 0.015$	$*p = 0.021$

Table 4.
The relationship between students' knowledge of TC and mean scores of TSE health belief scale's subscales (*n*: 360)

In the Netherlands study [12], the rate of hearing of TC was 26%. In a study by Rudberg *et al.* [25] on university students in Sweden, the rate was 11.3%. In the study of Vasudev *et al.* [26] in England, the rate was 91%. In a study by Khadra and Oakeshott [27] in England, this rate was reported as 91%. These findings might be the result of an insufficient focus on male health issues, not hearing of TSE which is necessary for early diagnosis of TC and early diagnosis of TC is not widespread enough.

In our study, 86.9% of the participants stated that they had no information about TC. In the study by Ugurlu *et al.* [14], 5.9% of the participants had knowledge; in Avci and Altinel [18], 18.4% of the participants were informed and in the study by Doğan *et al.* [1], 17.1% of the participants had previous knowledge. Only 5.8% of the students knew how to perform TSE. A total of 3.9% of the students perform TSE and 91.9% knew of the importance of TSE in the early diagnosis of TC.

Altınel and Avci reported that 6.2% of the students had heard of TSE [23]. Ercan [28] stated that 8.9% of the students knew of TSE. Lechner *et al.* [12] reported that 3% of the participants had knowledge. In the study by Khadra and Oakeshott [27], it was stated that 28% of the research group had information about TSE. Rudberg *et al.* [25] found that 5.6% of the students heard of TSE. In Göçgeldi *et al.*'s study on soldiers [24], this rate was at 20.7%.

Kuzgunbay *et al.* [29] reported that 11% of the students who participated in the study had knowledge and 2.5% of them had performed TSE. Ugboma and Aburoma [30] reported that 88.6% had not heard about TC and 63% did not know how to do TSE. Similarly, in our study, only 5.8% of the students knew how to perform TSE, 3.9% of the students performed TSE and 91.9% knew the importance of TSE in the early diagnosis of TC.

In our findings, 78.9% of the students wanted to receive information about TC and TSE. In a study conducted by Altınel and Avci, 76.6% of the participants stated that they wanted to get information about TC and TSE [23]. Göçgeldi *et al.* [24] reported this rate as 97% and in the studies of Ercan [28] and Yılmaz *et al.* [16]. In this research, the majority of students wanting to receive information may suggest that students' perceptions of seriousness about the subject may be high and that they can adopt early diagnosis more because they care about the subject.

Only 3.9% of the participating students in our study stated that they were performing TSE. Although students are at most risk, Doğan *et al.* [1] reported the rate of performing TSE as 6.1%. In the study conducted by Göçgeldi and Koçak, the rate of performing TSE at least once in their life was found to be 8.8% [10]. In a study conducted by Altınel and Avci [23] on university students, 3.3% of the students stated that they performed TSE. Our study data are similarly based on the studies conducted in Europe and Turkey. All these ratios are thought-provoking results for TSE, which can be learned and applied with simple education.

Asgar Pour *et al.* [31] stated that the participants had little information about TC and TSE. Similarly, in many studies, most of the participants stated that they did not know how to perform TSE [12, 14–16, 23–25, 27, 30, 32–35].

In the TSE health belief scale, the mean score of the susceptibility subscale was 11.23 ± 3.73, the mean score of seriousness subscale was 28.20 ± 7.66, the mean score of benefit and health motivation subscale was 21.57 ± 5.90, the mean score of barriers subscale was 22.74 ± 5.16, the mean score of self-efficacy subscale was 9.91 ± 3.13 and the mean score of health motivation subscale was 8.92 ± 2.84.

Similarly, in the study by Pınar *et al.*, [15], the highest mean score was determined as seriousness (20.69 ± 6.94, min: 5, max: 25). Following these mean scores, mean scores of the subscales given as self-efficacy (18.76 ± 5.01, min: 6, max: 30), barriers (11.51 ± 3.37, min: 5, max: 25), susceptibility (11.44 ± 4.56, min: 5) (max: 25) and perceived benefits (9.36 ± 2.68, min: 3, max: 15).

In the study of Akar and Bebiş [19], there was a significant difference in the beliefs and behaviors of peer education regarding TC and TSE.

In their study, Asgar Pour *et al.* [31] found no significant difference between the TSE health belief scale scores before and after TSE training. There was a statistically significant relationship between having heard of TC and health motivation ($p < 0.05$). There was a statistically significant relationship between the knowledge of TC and self-efficacy and health motivation ($p < 0.05$). There was a significant relationship between self-efficacy and TSE performing status ($p < 0.05$). There was also a significant relationship between the desire to obtain information about TSE and seriousness, barriers, self-efficacy and health motivation ($p < 0.05$).

Avci and Altinel [18] found a significant difference between participants who perform and those who do not perform TSE in the self-efficacy subscale. Self-efficacy scores of people who know and perform health-protective behaviors are higher than those who do not [36–38]. In order for the behavior change to be successful, the perception of susceptibility and seriousness toward the current situation must be high.

In our study, a significant difference was found in the self-efficacy and health motivation subscales of the scale for those with and without knowledge about TSE. In the study of Doğan *et al.* [1], the mean scores of self-efficacy of those who had previously received information about TC were significantly higher than those who did not. This study also found that the mean number of barriers subscale scores of the participants who performed TSE was lower than those who did not ($p = 0.040$) [1]. In our study, there was a statistically significant difference in the self-efficacy sub-dimension of the participants who performed TSE and those who did not.

In the study of Pınar *et al.*, [15], it was reported that the frequency of performing TSE increased in the last year of those with high seriousness perception scores. Although it is not statistically significant, it was determined that the frequency of performing TSE of participants with high "susceptibility", "self-efficacy" and "benefit" perception have increased in the last year, while the frequency of performing TSE of participants with high "barriers" perception has decreased.

Limitations
It was conducted only among a university student group who volunteered to participate; therefore, the findings cannot be generalized to all males at the university. For the generalization of results, it is recommended to conduct a study with an adequately calculated sample size large enough to allow for statistical testing and adopting a random selection method of participants.

Conclusion
The incidence of TC is increasing worldwide and is becoming a serious health problem. The majority of students did not know the symptoms of TC according to our study. The students who have heard about TC and have knowledge about it have high health motivations. The self-efficacy status of the students who knew of and perform TSE was higher. It is recommended that further studies with larger populations should be conducted. Also, education programs should be carried out about how to perform TSE among students.

Conflict of Interest: None

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