Research Article

# Evaluation of Knowledge, Attitudes and Behaviors of Family Physicians about Testicular Cancer and Testicular Self-Examination

**Duygu Ilke Yildirim***

*Department of Family Medicine, University of Health Sciences, Konya, Turkey*

**Corresponding author:**
Duygu Ilke Yildirim
Department of Family Medicine,
University of Health Sciences,
Konya, Turkey;
E-mail: azrailla@hotmail.com
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## Abstract

**Objective:** The aim of this study was to investigate the knowledge, attitudes and behaviors of family physicians regarding testicular cancer and testicular self-examination. **Methods:** This study was conducted with 307 physicians, including family physician specialists, family physician residents, contracted family physician specialist assistants (SAHU) and general practitioners, who agreed to participate in the study. All participants were administered a 33-item questionnaire consisting of socio-demographic questions and questions about testicular cancer and testicular self-examination, developed through literature review. **Results:** 307 family physician specialists, family physician residents, SAHU residents and general practitioners participated in the study. 10.4% of the participants were working as family medicine specialists, 67.4% as family physician assistants, 13.7% as SAHU residents and 8.5% as general practitioners. The rate of stating that all of the risk factors presented for testicular cancer are risks was found to be statistically significantly higher in specialist family physicians than in general practitioners and resident family physicians. **Conclusion:** The study revealed that family physicians lacked sufficient knowledge about testicular cancer and testicular self-examination, leading them not to recommend self-testicular examination to patients due to inadequate knowledge. In light of these findings, although self-testicular examination may not be recommended as a screening method, increasing awareness and knowledge among both family physicians and the public is crucial.

**Keywords:** Testiculer cancer; Family medicine; Self-examination

## Introduction

Cancer is a public health issue worldwide and is the second leading cause of death globally and in our country [1,2]. One in every five people worldwide is diagnosed with cancer at some point in their life [3]. Although mortality has decreased with advancements in medicine, cancer morbidity remains high and its incidence is increasing [1]. It is estimated that the number of cancer diagnoses, which was 19.3 million in 2020, will rise to 30.2 million by 2040 [4].

Testicular cancer is relatively rare, accounting for about 1% of all male tumors. However, it is the most common solid tumor in men aged 15-35 and its incidence has been increasing globally over the past few decades [5]. The rising incidence of testicular cancer highlights the importance of early detection and treatment. The significance of early diagnosis and treatment of testicular cancer has been known for many years [6]. With early diagnosis, the 5-year survival rate is known to be 99% [7]. Before curative treatments were available, early diagnosis and treatment were among the few ways to prevent mortality in young and healthy men. Although mortality rates have decreased with advancements in treatment, comprehensive chemotherapy or surgery required in cases of late diagnosis increases morbidity [8]. Despite the value of early detection, various studies around the world have reported an average delay of 26 weeks from the first symptom to surgical diagnosis [6,8]. These delays can be attributed to



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both patients and healthcare personnel. Patient-related causes of delayed diagnosis include ignorance, shame, fear of results and fear of emasculation, leading to late presentation to healthcare services [9].

Self-examination of the Testicles (TSE) is a simple, cost-free, non-invasive method that does not require technical tools and can be performed quickly, enabling the early diagnosis of testicular cancer or testicular diseases for all men. Additionally, regular monthly TSE helps in the early recognition of changes by familiarizing oneself with the testicular tissue [10]. TSE increases the chance of early detection of testicular cancer by 9-10 times. Despite the increasing incidence of testicular cancer, studies have shown that men are not well-informed about testicular cancer and its prevalence, do not recognize its general symptoms and almost never perform TSE. Similar results were found in a study conducted with final-year medical students in Nigeria.

The aim of this study is to evaluate family physicians' knowledge, attitudes and behaviors regarding testicular cancer and testicular self-examination.

## Materials and Methods

This descriptive and cross-sectional study was conducted between 01.08.2021 and 01.12.2021 with 307 physicians, including family medicine specialists, general practitioners, family medicine residents, and SAHU (contracted family physician) residents, who were working and voluntarily participated in the study. Data were obtained by administering a web-based online survey, which included informed consent and was created through a literature review, to family physicians suitable for participation in our study.

### Data collection tools

Data were collected using a questionnaire developed by reviewing the literature and previous similar studies. The questionnaire included sociodemographic characteristics (age, gender, marital status, information about the institution and unit where they work, years in the profession, professional title), general information about testicular cancer, risk factors, characteristics of TSE (frequency of performance, when it should be done, how it is done) and symptoms of testicular cancer. Before administering the survey, it was given to 20 family physicians working in primary care at different institutions to evaluate the understandability of the survey and identify any issues with the questions.

### Data analysis

The data obtained from the study were analyzed using the SPSS (Statistical Package for Social Sciences) 18.0 software. In descriptive analyses, frequency data were presented as number (n) and percentage (%), while numerical data were presented as mean ± Standard Deviation (SD) and minimum-maximum. The *Chi-square* ($\chi^2$) test and Fisher's exact test were used to compare categorical data. The results were evaluated within a 95% confidence interval, with significance considered at $p<0.05$.

## Results

This study included 307 participants working as family medicine residents, family medicine specialists and general practitioners. Of the participants, 55% (n=169) were male and 45% (n=138) were female. Among the participants, 67.4% (n=207) were family medicine residents, 13.7% (n=42) were SAHU residents, 10.4% (n=32) were family medicine specialists and 8.5% (n=26) were general practitioners. The other socio-demographic characteristics of the participants are shown in Table 1.

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

| Variables | Categories | n | % |
|---|---|---|---|
| Gender | Female | 138 | 45 |
| | Male | 169 | 55 |
| Age (years) (Mean ± SS, Min-Max)* | | 30.54 ± 6.01 | (24.00-60.00) |
| Age category | 24-40 years | 288 | 93.8 |
| | 41-60 years | 19 | 6.2 |
| Marital status | Married | 169 | 55 |
| | Single | 138 | 45 |
| Profession | Family medicine | 32 | 10.4 |
| | General practitioner | 26 | 8.5 |
| | SAHU | 42 | 13.7 |
| | Family medicine resident | 207 | 67.4 |

| | | | |
|---|---|---|---|
| Instituion | ASM (Family health center) | 78 | 25.4 |
| | TSM (Community health center) | 4 | 1.3 |
| | Medical faculty | 73 | 23.8 |
| | City hospital | 125 | 40.7 |
| | Training and research hospital | 23 | 7.5 |
| | Other | 4 | 1.3 |
| Years in profession (years) (Mean ± SS, Min-Max)* | | 5.93 ± 5.89 | (0.00-37.00) |

**Note:** *: Mean ± Standard deviation, Minimum-Maximum

The rates of family medicine residents following up on testicular cancer patients were found to be statistically significantly lower compared to general practitioners and family medicine specialists (p=0.003). Family medicine specialists were statistically significantly more likely to indicate that mumps infection, estrogen use during pregnancy, and other risk factors presented for testicular cancer were all risks compared to general practitioners and resident family physicians (p values were 0.001, 0.004, and 0.002, respectively). The rate of indicating that gynecomastia, hematuria, abdominal pain and other symptoms presented for testicular cancer could all be symptoms of testicular cancer was also statistically significantly higher in family medicine specialists compared to the group of general practitioners and residents (p values were 0.008, 0.015, 0.003 and <0.001, respectively). The rate of receiving education other than medical school education about TSE was statistically significantly higher in family medicine specialists compared to general practitioners and residents (p=0.036) (Table 2).

**Table 2: Distribution of responses regarding Testicular Cancer (Testis Ca) and Testicular Self-Examination (TSE) by title groups.**

| | Title** | | | | |
|---|---|---|---|---|---|
| **Characteristic** | **Specialist (n=32) n (%)** | **Practitioner (n=26) n (%)** | **Resident (n=249) n (%)** | **$X^{2***}$** | **p** |
| **Testicular cancer patient follow-up** | | | | | |
| Yes | 16 (50.0) | 8 (30.8) | 56 (22.5)* | 11.465 | 0.003 |
| No | 16 (50.0) | 18 (69.2) | 193 (77.5) | | |
| **Is mumps infection a risk for testicular cancer?** | | | | | |
| Yes | 24 (75.0)* | 9 (34.6) | 104 (41.8) | 13.825 | 0.001 |
| No | 8 (25.0) | 17 (65.4) | 145 (58.2) | | |
| **Is estrogen use during pregnancy a risk for testicular cancer?** | | | | | |
| Yes | 21 (65.6)* | 8 (30.8) | 91 (36.5) | 10.896 | 0.004 |
| No | 11 (34.4) | 18 (69.2) | 158 (63.5) | | |
| **Are all factors risks for testicular cancer?** | | | | | |
| Yes | 21 (65.6)* | 8 (30.8) | 84 (33.7) | 12.843 | 0.002 |
| No | 11 (34.4) | 18 (69.2) | 165 (66.3) | | |
| **Is gynecomastia a symptom of testicular cancer?** | | | | | |
| Yes | 22 (68.8)* | 15 (57.7) | 105 (42.2) | 9.554 | 0.008 |
| No | 10 (31.2) | 11 (42.3) | 144 (57.8) | | |
| **Is hematuria a symptom of testicular cancer?** | | | | | |
| Yes | 22 (68.8)* | 12 (46.2) | 104 (41.8) | 8.36 | 0.015 |
| No | 10 (31.2) | 14 (53.8) | 145 (58.2) | | |
| **Is abdominal pain a symptom of testicular cancer?** | | | | | |

| | | | | | |
|---|---|---|---|---|---|
| Yes | 22 (68.8)* | 15 (57.7) | 99 (39.8) | 11.723 | 0.003 |
| No | 10 (31.2) | 11 (42.3) | 150 (60.2) | | |
| **Are all symptoms indicative of testicular cancer?** | | | | | |
| Yes | 22 (68.8)* | 11 (42.3) | 79 (31.7) | 17.189 | <0.001 |
| No | 10 (31.2) | 15 (57.7) | 170 (68.3) | | |
| **TSE education** | | | | | |
| Received at least one different education | 14 (43.2)* | 6 (23.1) | 57 (22.9) | 6.626 | 0.036 |
| Did not receive any different education | 18 (56.3) | 20 (76.9) | 192 (77.1) | | |

**Note:** *Indicates the source of the difference, **Column percentages are provided, ***_Chi-square_ test was used

Participants with a history of following up on testicular cancer patients were found to have statistically significantly higher rates of reading informative sources and receiving at least one different type of education other than medical school education about testicular cancer, believing they had partially sufficient knowledge about testicular cancer and reading informative sources about TSE compared to participants without a history of following up on testicular cancer patients (p values were 0.007, 0.010, 0.006 and 0.003, respectively). It was also determined that all participants with a history of following up on testicular cancer patients believed that regular testicular examinations were beneficial (Table 3).

**Table 3: Comparison of participants' education and knowledge status regarding testicular cancer and TSE by testicular cancer follow-up history.**

| | Testicular cancer follow-up** | | | |
|---|---|---|---|---|
| **Feature** | **Present (n=80) n (%)** | **Absent (n=227) n (%)** | **$\chi^{2***}$** | **p** |
| **Informative source reading** | | | | |
| Yes | 32 (40.0) | 55 (24.2) | 7.245 | 0.007 |
| No | 48 (60.0) | 172 (75.8)* | | |
| **Education** | | | | |
| Received different education | 39 (48.8) | 74 (32.6) | 6.634 | 0.01 |
| No different education | 41 (51.3) | 153 (67.4)* | | |
| **Adequate knowledge level** | | | | |
| Yes | 1 (1.3) | 5 (2.2) | 7.428 | 0.006 |
| No | 16 (20.0) | 83 (36.6) | | |
| Partially | 63 (78.8)* | 139 (61.2) | | |
| **TSE informative source reading** | | | | |
| Yes | 23 (28.8)* | 32 (14.1) | 8.637 | 0.003 |
| No | 57 (71.2) | 195 (85.9) | | |
| **Regular testicular examination** | | | | |
| Beneficial | 80 (100.0) | 214 (94.3) | | |
| No beneficial | - | 13 (5.7) | | |

## Discussion

The knowledge, attitudes and behaviors regarding Testicular Cancer (TC) and Testicular Self-Examination (TSE) of 307 physicians, including family medicine specialists, general practitioners and family medicine residents who voluntarily participated in our study, were examined. In our literature review, we did not come across any study examining the knowledge, attitudes and behaviors of family physicians regarding TSE, hence we were unable to make comparisons with the literature. Previous studies have predominantly

focused on young men, medical students and allied health personnel.

Overall, our findings indicate that participants generally lacked sufficient knowledge about TC and TSE, with correct response rates close to or below the average. This deficiency in knowledge may be attributed to the reluctance of international and local health organizations to recommend TSE, the relatively low prevalence of TC, its exclusion from national cancer screening programs and insufficient emphasis on TC and TSE in medical school curricula.

Uyar et al. found that 73.4% of final-year medical students were unaware of TSE and the TSE implementation rate was 32.1%. Similarly, Bektaş et al. found that 91.8% of male nursing students lacked sufficient knowledge about TSE, 65.6% did not know how to perform TSE and only 11.6% performed TSE. In another study, Altınel et al. found that 93.8% of students had never heard of TSE, 3.3% did not know how to perform it, and 18.8% of those who claimed to know how to perform it did so incorrectly. Gocgeldi et al., in a study among young adult males, found that only 20.7% had heard of TSE, 8.8% had performed it at least once and 57.6% of those who had not performed it were unaware of the TSE technique. They also found that 69.8% of participants did not perform testicular examinations on patients diagnosed with or suspected of infertility, possibly due to the condition's association with urology rather than primary care.

Family medicine specialists had significantly more knowledge about TC risk factors and symptoms compared to other participants. They also had a higher rate of receiving different types of education outside medical school education about TC. Medical specialization appears to contribute to greater knowledge and expertise in TC and TSE. Participants with a history of following up on TC patients were found to have more knowledge about TC and TSE. This suggests that physicians who follow TC patients have more knowledge and expertise in this area.

## Conclusion

The study revealed that family physicians lack sufficient knowledge about testicular cancer and Testicular Self-Examination (TSE), leading them to not recommend TSE to their patients due to inadequate awareness.

In light of these findings, although TSE is not currently recommended as a screening method, raising awareness on this topic is crucial. It is necessary to increase the knowledge level of family physicians and the community, organizes informative meetings for family physicians, include this topic in the training programs of family medicine assistants and assign projects related to this topic to 6$^{th}$-year medical students and students in community-based medical education programs. We believe that these measures will increase awareness of testicular cancer and be highly beneficial.

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