

The knowledge of students from eastern Poland on testicular cancer and its prevention

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ABSTRACT

Introduction: Testicular cancer is the most common cancer among young men. Research suggests self-examination is a useful tool in the prevention of testicular cancer.

The aim of the study is to evaluate the knowledge of students in eastern Poland on the topic of testicular cancer and how to prevent this.

Materials and methods: A total of 410 male students were recruited from the cities of Lublin and Chełm in eastern Poland. The study was conducted by means of an original diagnostic opinion poll. The study was conducted in 2017.

Results: The age range of respondents was 18–28 years. The average age was 21.24 ± 1.43 years. The majority of respondents (46.1%, n = 189) had sufficient knowledge concerning testicular cancer prevention. Only 12.44% of the men declared regular testicular self-examination.

Conclusions: Awareness of testicular cancer in the population of surveyed students is insufficient, which is the main reason for failure to regularly self-examine the testes. Implementation of educational programs and training on the prevention of testicular cancer is required.

Keywords: testicular cancer; testicular self-examination; knowledge; university students.

INTRODUCTION

Over the past 4 decades, the incidence of testicular cancer (TC) in the world have more than doubled [1]. In 2010, the prevalence of TC in Poland was lower than the average for EU countries (5.1/105 vs. 6.0/105) [2]. Testicular cancer in Poland is a relatively rare type of cancer; in 2014, it constituted 1.4% of all malignancies among men [3]. However, this is the most common malignant tumor among young males; in 2011, among Polish males aged 20–44, it was the most frequently diagnosed malignant tumor [4].

Although the etiology of TC remains undetermined, it is believed that both genetic and acquired components play a role. Known risk factors include cryptorchidism (undescended testis), the genetic burden of TC, and Caucasian race [5, 6]. Symptoms of TC include heaviness in the scrotum and abnormal enlargement or swelling of the testicles accompanied by pain or discomfort in the testes. However, the most common symptom is a painless swelling of the testicle [7]. In 90% of cases, testicular enlargement appears in men with TC [8]. Men who are in the early stage of the disease have a better prognosis, with a 10-year survival time in >95% of patients [9]. Therefore, early detection is essential for successful treatment [10].

Testicular self-examination (TSE) is a convenient, inexpensive, and effective method for the early detection of neoplastic lesions. Regular self-examination of the testicles is a relatively

simple method to detect the vast majority of TC types at an early stage characterized by one of the highest 5-year survival rates [11].

In Poland, there have been organized socio-educational campaigns to help in the prevention of TC for several years. Their goal is to build awareness of the disease, overcome taboos, teach men how to perform TSE, and above all, to draw attention to methods of prevention that can save lives. The most well-known and large-scale campaigns are “Courageous win” – which has been in operation since 2009 [12], “Movember” – started in 2014 [13], and “Catch testes” – since 2016 [14].

Despite an increase in men’s awareness of cancer, its diagnosis, and treatment, the number of people who are admitted for late treatment is still high [15, 16]. Although current Polish quantitative research provides significant information on young men’s knowledge regarding TC and TSC [17, 18, 19, 20, 21, 22], subsequent empirical analyses would allow for a more thorough exploration of this topic. The authors of the quantitative research cited above also see the need for further investigation. Moreover, an important aspect that justifies the need for a more in-depth analysis of this issue are the results of research conducted by Piróg et al., which indicate that physicians’ activities in education are not exhaustive enough. This is despite the fact that the majority of men consider physicians the most reliable source of information [20]. Besides this, the main reason for the lack of regular TSE is a low awareness of

the problems associated with TC [22]. It is therefore important to explore this topic by comparing the results of research in Poland with the results of studies among young men from other countries.

The study aimed to evaluate the knowledge of students in eastern Poland on the topic of TC and its prevention.

MATERIALS AND METHODS

Research was conducted in 2017 on 480 male students, aged 18–28, from 5 institutions of higher learning in the Lublin voivodeship (Fig. 1). The size of the research sample for this age category was calculated using the Dobson formula [23]. The stratified sampling method was used to select the study group. Of the 480 persons surveyed, 410 qualified for further research. The diagnostic survey with questionnaire method was used to gather data. Information was gathered by the paper and pencil interview method. The research was voluntary and anonymous. Each respondent was informed as to the goal of the research and the manner of completing the questionnaire. The research procedure was conducted in accordance with the principles of the Helsinki Declaration.

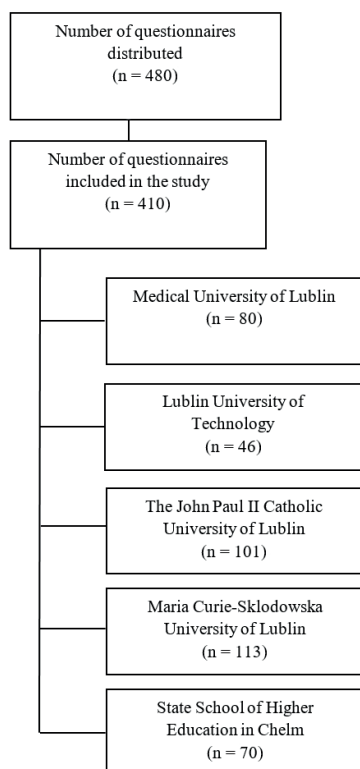


FIGURE 1. Diagram showing the method of selecting group participants

Instruments

The research was cross-sectional and consisted of 3 parts. The 1st part contained a questionnaire about TC and its prevention. In the 2nd part of the survey, respondents were asked to indicate the frequency with which they perform TSE. The final part gathered the respondents' sociodemographic data.

The questionnaire regarding TC, its prophylaxis and treatment consisted of 20 statements; the first 3 statements and question numbers 16–17 were concerned with knowledge about TSE, and the remaining questions were related to symptoms, risk factors, treatment methods, epidemiology and detection of TC. Respondents chose answers to statements from 2 options: "true" or "false".

The frequency of TSE was assessed by the question: "How often do you perform self-examination of the testicles?". Possible answers were: "once a month", "once every 6 months", "once a year", and "not at all". With a relatively small percentage of people who declared performing self-examination once a month, once every 6 months, or once a year, the subjects were regrouped according to whether they performed TSE "sometimes" or "not at all".

In the 3rd part of the questionnaire, the respondents were asked to indicate their age, and then were divided into the following groups: 20 years and under, 21 years, and 22 years and over. The next question was concerned with the respondent's permanent place of residence ("rural area" or "urban area") and place of residence during studies ("family home", "relatives" "dormitory" or "flat share"). Participants were asked to indicate the field of study, which was then classified as medical (nursing, emergency medical, biotechnology, medical and pharmacy) and non-medical (English philology, Slavic philology, construction, computer science, sociology, psychology, and theology). In subsequent questions, respondents were asked to determine their material status ("bad", "average", "good" or "very good"), the presence of cancer in the immediate family medical history ("yes" or "no"), smoking ("yes" or "no") and health ("poor", "average", "good", "very good").

Statistical analysis

Data from the questionnaire was organized and then codified according to defined categories and mapped in the Microsoft Office Excel program. The grouped material was subjected to statistical analysis to achieve full and detailed characteristics. The values of the measurable parameters analyzed were presented using the mean value and standard deviation, and non-measurable as cardinality and percentage. For qualitative features, χ^2 was used to detect the existence of a relationship between the analyzed variables. A significance level of $p < 0.05$ was set, indicating the presence of statistically significant differences or dependencies. The database and statistical surveys were analyzed using the computer software Statistica 9.1 (StatSoft, Poland).

RESULTS

Research group

In the group of 410 men aged 18–28, the average age was 21.24 ± 1.43 years. The largest group were respondents aged 22 and above – 36.01% ($n = 148$). Most students were residents of rural areas – 51.22% ($n = 210$). Respondents studying non-medical

subjects accounted for 80.49% (n = 330) of the studied group. Other sociodemographic features are presented in Table 1.

TABLE 1. Socio-demographic structure of the studied group (n = 410)

	Variable	n (%)
Age	up to 20 years	124 (30.24)
	21 years	138 (33.66)
	22 and over	148 (36.1)
Place of residence	urban area	200 (48.79)
	rural area	210 (51.21)
Faculty of studies	medical	80 (19.51)
	nonmedical	330 (80.49)
Material status	bad	5 (1.22)
	average	99 (24.15)
	good	235 (57.32)
	very good	71 (17.32)
Oncological family history	yes	147 (35.85)
	no	263 (64.15)

Knowledge of testicular cancer, its prevention, and its determinants

Of the 20 statements assessed by students about TC in Table 2, the ten most frequently mentioned answers are presented. Supplementary material from the remaining ten statements is provided in Table 3.

The results obtained from the students show that the majority of respondents – 90.24% (n = 370) – are familiar with the correct technique for conducting TSE and 93.17% (n = 382) know that they should be looking for changes in appearance or touch. Moreover, 91.95% (n = 377) of the respondents had knowledge about the symptoms, and 89.02% (n = 365) of the risk factors of TC. Among respondents 67.07% (n = 257) knew

that TSE should be performed monthly, and 78.29% (n = 321) believe that TSE should only begin once the person has reached the age of 35. As many as 64.15% (n = 263) of the respondents mistakenly assert that the removal of a testicle, as a result of neoplastic changes, negatively affects sexual activity, and 63.17% (n = 259) assert that this type of cancer occurs most often in men aged 45–70. Among of respondents 45.37% (n = 186) said that TC is an incurable disease and 36.34% (n = 149) said that the recommended method for detecting this cancer is frequent urine testing (Tab. 2).

The responses obtained were given points – for each correct answer, the respondent received 1 point; for an incorrect or blank answer, 0 points. The respondent could obtain a maximum of 20 points. The knowledge of the respondents was evaluated under 4 categories, depending on the number of points received, as “insufficient”, “sufficient”, “good”, and “very good”.

An overall analysis of the results on the knowledge of TC, its prevention and treatment, demonstrates that these students represent a below-average level of knowledge (M = 13.24; SD = 2.31). A detailed analysis of the correct answers obtained based on the author’s answer key, showed that most of those surveyed (46.1%, n = 189) had sufficient knowledge (between 10.94–13.24 points), while 10.73% (n = 44) had insufficient knowledge (below 10.93 points). Only 17.56% (n = 72) of the surveyed students showed a very good state of knowledge (15.57–20 points), and 25.61% (n = 105), a good state (13.25–15.56 points) – Table 4.

To assess the conditions of knowledge among students, the statistical relationship between knowledge in terms of its 4 degrees (“insufficient”, “sufficient”, “good”, and “very good”) and selected sociodemographic variables was investigated. Analysis of the collected material allows us to conclude that some sociodemographic factors have a significant impact on the state of knowledge. Detailed data are presented in Table 4.

Statistical analysis showed that the state of knowledge is significantly dependent on the field of study (p < 0.001). Respondents

TABLE 2. Results of the assessment on knowledge about testicular cancer and prophylaxis in the studied group

Number	Conclusions	True n (%)	False n (%)
1.	When performing self-examination, the testicle should be held between the thumbs and the fingers of both hands. Gently massaging the organ in your hands and moving your fingers over it, look for any swelling, bumps, or unevenness	370 (90.24)	40 (9.76)
2.	Testicular self-examination is performed to identify changes in appearance and touch	382 (93.17)	28 (6.83)
3.	Symptoms such as swelling or thickening in one testicle, painless swelling, the experience of dull pain and heaviness in the scrotum may indicate testicular cancer	377 (91.95)	33 (8.05)
4.	The risk factors for developing testicular cancer include a diagnosis of testicular cancer in a family member, Caucasian race, a diet high in fat, alcohol consumption, low physical activity, and smoking cigarettes	365 (89.02)	45 (10.98)
5.	It is recommended that testicular self-examination be performed once a month	257 (67.07)	135 (32.93)
6.	Testicular self-examination should be performed regularly after the age of 35	321 (78.29)	89 (21.71)
7.	Removal of the testicle due to neoplastic changes negatively affects male sexual activity	263 (64.15)	147 (35.85)
8.	Testicular cancer is the most common cancer in men between 45–70 years of age	259 (63.17)	151 (36.83)
9.	Testicular cancer is a non-treatable disease, even when diagnosed very early, because cancer cannot be cured entirely	186 (45.37)	224 (54.63)
10.	The recommended method for detecting testicular cancer is frequent urine analysis	149 (36.34)	261 (63.66)

The correct answers are marked in bold.

TABLE 3. Results of the assessment on knowledge about testicular cancer and prophylaxis in the studied group

Number	Conclusions	True n (%)	False n (%)
1.	It is recommended to perform testicular self-examination during a shower or bath	240 (58.54)	170 (41.46)
2.	The testicle where the pathological changes appear should be soft and smooth to the touch	101 (24.63)	309 (75.37)
3.	Normal testicles have an irregular shape	189 (46.10)	221 (53.90)
4.	Testicular cancer is a malignant tumor	313 (76.34)	97 (23.66)
5.	A cause of cancer of the testis may be an undescended testis (cryptorchidism) in childhood	257 (62.68)	153 (37.32)
6.	A practical method of treatment of testicular cancer is orchidectomy or surgical removal of the testis	341 (83.17)	69 (16.83)
7.	In most cases, testicular cancer is painless which results in the misfortune of many patients ignoring the symptoms and delaying reporting to the doctor	326 (79.51)	84 (20.48)
8.	When performing testicular self-examination, one should start by looking at the scrotum to see if there are any distortions and that the skin is not tense or different	358 (87.32)	52 (12.68)
9.	Normal testicles are symmetrical	202 (49.27)	208 (50.73)
10.	Testicular cancer does not promote metastases to the lymph nodes and other organs due to the location of the testes i.e., outside the abdominal cavity	197 (48.05)	213 (51.95)

The correct answers are marked in bold.

TABLE 4. State of knowledge about testicular cancer prevention and selected sociodemographic variables

Variable	Categories	Knowledge – n (%)				Statistical analysis
		insufficient	sufficient	good	very good	
Age	20 years and below	9 (7.26)	50 (40.32)	37 (29.84)	28 (22.58)	$\chi^2 = 12.08$ $p = 0.60$
	21 years	14 (10.14)	70 (50.72)	38 (27.54)	16 (11.59)	
	22 years and above	21 (14.19)	69 (46.62)	30 (20.27)	28 (18.92)	
Place of residence	urban area	20 (10.00)	94 (47.00)	52 (26.00)	34 (17.00)	$\chi^2 = 0.36$ $p = 0.95$
	rural area	24 (11.43)	95 (45.24)	53 (25.24)	38 (18.10)	
Faculty	medical	4 (5.00)	23 (28.75)	25 (31.25)	28 (35.00)	$\chi^2 = 27.98$ $p < 0.001$
	nonmedical	40 (12.12)	166 (50.30)	80 (24.24)	44 (13.33)	
Material status	bad	2 (40.00)	2 (40.00)	1 (20.00)	0 (0.00)	$\chi^2 = 17.44$ $p = 0.042$
	average	14 (14.14)	38 (38.38)	32 (32.32)	15 (15.15)	
	good	27 (11.49)	112 (47.66)	52 (22.13)	44 (18.72)	
	very good	1 (1.41)	37 (52.11)	20 (28.17)	13 (18.31)	
Oncological family history	yes	16 (10.88)	55 (37.41)	39 (26.53)	37 (25.17)	$\chi^2 = 11.38$ $p = 0.0098$
	no	28 (10.65)	134 (50.95)	66 (25.10)	35 (13.31)	

studying in the medical field are characterized by significantly greater knowledge (good – 31.25%, $n = 25$, very good – 35%, $n = 28$) on the subject of TC prevention than students of non-medical majors (good – 24.24%, $n = 80$, very good – 13.33%, $n = 44$).

In addition, it was found that respondents with a higher material status (good – 18.72%, $n = 44$, very good – 18.31%, $n = 13$) had significantly more knowledge than people with a lower material status (bad – 40%, $n = 2$, average – 14.14%, $n = 14$). The difference was statistically significant ($p = 0.042$).

There was also a significant correlation between the level of knowledge and the occurrence of cancer in the family ($p = 0.009$). Respondents who had cancer in the family (25.17%, $n = 37$)

were significantly more knowledgeable than respondents in the family who did not have cancer (13.31%, $n = 35$).

There were no statistically significant correlations between the state of knowledge and age, place of residence, and self-assessment of health.

Declared frequency of testicular self-examination in the studied group of students and its selected determinants

The results obtained on the declared frequency of TSE indicated that as many as 63.17% ($n = 259$) of respondents admitted that they did not perform this test at all, 14.64% ($n = 60$) performed this test once a year, and 9.75% ($n = 40$) once every 6 months. Only 12.44% ($n = 51$) of students performed TSE once a month.

Statistical analysis showed that the declared frequency of TSE was significantly dependent on age ($p = 0.039$). The respondents aged 20 years and below (45.97%, $n = 57$) declared TSE substantially more often than participants aged 22 years and above (33.78%, $n = 50$) and aged 21 years (31.88%, $n = 44$).

As a result of the statistical analysis, it was found that the respondents studying medical subjects (51.25%, $n = 41$) declared TSE significantly more often than respondents studying in non-medical fields (33.33%, $n = 110$, $p = 0.003$).

There was also a significant relationship between the levels of declared TSE and the occurrence of cancer in the family ($p = 0.02$). Students who were not characterized by oncological family history (44.22%, $n = 65$) significantly more often declared that they performed TSE compared to the respondents who had cancer in their family (32.70%, $n = 86$).

There were no statistically significant correlations between the declared frequency of self-testing of the testes and the place of residence or the material status (Tab. 5).

TABLE 5. Declared frequency of testicular self-examination and selected sociodemographic variables

Variable	Categories	Knowledge – n (%)		Statistical analysis
		sometimes	not at all	
Age	20 years and below	57 (45.97)	67 (54.03)	$\chi^2 = 6.49$ $p = 0.039$
	21 years	44 (31.88)	94 (68.12)	
	22 years and above	50 (33.78)	98 (66.22)	
Place of residence	urban area	81 (40.50)	119 (59.50)	$\chi^2 = 2.26$ $p = 0.133$
	rural area	70 (33.33)	140 (66.67)	
Faculty	medical	41 (51.25)	39 (48.75)	$\chi^2 = 888$ $p = 0.003$
	nonmedical	110 (33.33)	220 (66.67)	
Material status	bad	3 (60.00)	2 (40.00)	$\chi^2 = 5.97$ $p = 0.113$
	average	33 (33.33)	66 (66.67)	
	good	81 (34.47)	154 (65.53)	
	very good	34 (47.89)	37 (52.11)	
Oncological family history	yes	86 (32.70)	117 (67.30)	$\chi^2 = 5.38$ $p = 0.02$
	no	65 (44.22)	82 (55.78)	

DISCUSSION

Young men are not fully aware of the risk of developing TC, which is the most common type of cancer for their age group. The results of the authors' own study [21] as well as the results of studies conducted on different groups of men in Poland by other authors such as Baran et al. ($n = 300$ men aged 18–35) [17], Kędra and Pyśk ($n = 150$ men aged 20–45) [18], Pieraszek et al. ($n = 198$ men aged 17–29) [19], Piróg et al. ($n = 131$ men aged 17–38) [20] and Sugajska et al. ($n = 296$ men aged 20–32) [22], clearly show that the knowledge in this demographic on the topic of TC and its prevention is insufficient. This is also confirmed by results of a study conducted at 5 universities in 5

Asian and African countries on a group of 2,061 men aged 16–30 (average age 21.4; $SD = 2.4$), which showed that of the whole study group, only 17.6% of male students indicated that they knew how to perform a TSE. In Bangladesh and Singapore, this percentage was over 20%, whereas it was lowest in Madagascar (12.2%) [23]. Studies of medical students at the University of Nigeria ($n = 101$) and secondary school students in Uganda ($n = 160$), confirmed that there is a low level of knowledge among men on the topic of TC as well as a poor awareness of the practice of TSE [7, 24]. In an analysis performed by Ugwumba et al., it was confirmed that the symptom of TC most widely known among the respondents was testicular pain (58%) [24]. Similar results were presented by Sugajska et al., where testicular pain was indicated by 57% of students from Warmińsko-Mazurski University [22]. Of those surveyed, only 19% [24] knew that testicular enlargement or a tumor (12%) [22], could be signs of TC. The present study did not analyze the factors related to the failure in performing TSE, although it did confirm that a small percentage of the young men surveyed (12.44%) do this on a regular basis. Pietraszek's et al. research showed that 26.3% of respondents declared knowledge of self-examination techniques, but only 2.5% of all the men surveyed performed them correctly, citing a lack of knowledge as the main cause of difficulty in performing this examination [19]. Research reports by other authors also confirm this [25, 26]. Özbaş et al. showed that only 12% ($n = 33$) of 275 surveyed young men of Turkish origin knew what a TSE consists of, and only 4.3% ($n = 12$) performed it [25].

A consequence of insufficient knowledge in the field of testicular neoplasms may cause an undesirable delay in appropriate diagnosis [24]. This is confirmed by an analysis by Öztürk et al., which indicates that a low level of education has a greater influence on belated diagnosis than factors such as age or material status [27]. Embarrassment is another important reason cited by the author for causing delays in consulting a physician about potential pathological changes. The same factor was also indicated by Roy and Casson who showed that, in order to increase motivation of young men to perform TSE, awareness of the risk of the disease and knowledge of its symptoms are necessary [28]. In the USA, it is recommended that doctors provide information on TC and encourage young men aged 15–35 to perform TSE [29]. It has been demonstrated that men who have a greater knowledge of the risk factors and symptoms of TC perform self-examinations more regularly than others [30, 31]. Undoubtedly, an important aspect of disseminating knowledge about TC and TSE is through an increase of socio-educational campaigns for men and their families using social marketing methods, as well as doctors and nurses teaching techniques of self-examination more frequently [32].

Limitations

The study was cross-sectional; therefore, causal conclusions cannot be drawn. A significant limitation was the fact that it was only carried out in 2 cities in eastern Poland. Moreover, students are not a representative group for young adult men in general due to their age and level of education. Despite these

limitations, which may affect the amount of generalizations that can be drawn from the results, we believe that our findings may form the basis for multicenter research in the future.

CONCLUSIONS

The results obtained show that the knowledge of young men concerning the prevention of TC is still insufficient. A low awareness of the problem is the main reason for the unsatisfactory frequency of TSE in the studied group of students. Efforts should be made to develop targeted educational programs that can increase knowledge regarding TC in young men as well as the practice of TSE. It is necessary to urgently develop and implement proven educational programs aimed at the prevention of TC addressed not only to men but also to people significant in their social environment.

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