

Awareness of testicular swelling among young adults in Saudi Arabia: A cross-sectional study

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Abstract

Background: Testicular masses can be a sign of various medical problems, ranging from acute emergencies such as testicular torsion to chronic illnesses such as cancer. Therefore, examinations, including self-examinations, are an important procedure for diagnosis and treatment, which can help prevent complications such as loss of fertility.

Aims: The aim of this study was to evaluate the level of awareness about scrotal swelling among adult men in Saudi Arabia.

Materials and Methods: A cross-sectional survey was administered to 3502 males, aged 18–50 years, from August 2021 to March 2022.

Results: A total of 3502 participants from different regions of Saudi Arabia responded to our survey over 43 days, from August 21, 2021 to October 3, 2021. Unmarried, Master's/PhD graduated male, showed a high level of knowledge and attitude toward testicular swelling.

Conclusion: The prevalence of cases of scrotal swelling, coupled with the lack of reporting or immediate intervention, was one of the reasons for the lack of research about this subject. The study notices several factors which impacted on participants' awareness of scrotal swelling and the risks it poses. The results also emphasized the importance of self-examination in respect to the avoidance of complications such as testicular cancer.

Keywords: Awareness, scrotal swelling, self-testicular examination, testicular swelling, young adult

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INTRODUCTION

A scrotal mass is a lump or swelling in the scrotum that can usually be detected through touch. The scrotum is the sac that contains the testicles and the structures that produce, transport and store male hormones and sperm. These lumps may or may not be painful.^[3]

Testicular masses can represent a variety of medical problems, ranging from acute emergencies such as testicular torsion to chronic illnesses such as cancer.^[1] Therefore, examinations, including self-examinations, are an important procedure for diagnosis, immediate intervention and treatment, to prevent complications such as loss of fertility.^[3]

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Table 1: Characteristics of the sample (n=3502)

Demographic profile	n (%)
Age (years)	
18-25	1542 (44.1)
25-30	934 (26.7)
30-40	511 (14.6)
40-50	296 (8.5)
<18	85 (2.4)
>50	132 (3.8)
Gender	
Male	3042 (87)
Female	455 (13)
Region	
Riyadh	523 (14.9)
Mecca	608 (17.4)
Eastern province	296 (8.5)
Medina	418 (11.9)
Al-Qassim	245 (7)
Tabuk	226 (6.5)
Al-Jawf	183 (5.2)
Al Bahah	100 (2.9)
Asir	228 (6.5)
Northern borders	143 (4.1)
Jizan	184 (5.3)
Ha'il	154 (4.4)
Najran	192 (5.5)
Nationality	
Saudi	3242 (92.6)
NonSaudi	258 (7.4)
Marital status	
Married	1479 (42.3)
Unmarried	2021 (57.7)
Educational level	
Elementary/intermediate	67 (1.9)
High school	743 (21.2)
Bachelor's	2388 (68.2)
Master's/PhD	271 (7.7)
Culprit/uneducated	31 (0.9)
Residence	
Urban	3026 (86.5)
Rural	474 (13.5)

In the US, testicular cancer is the most common solid tumor among males aged from 15 to 34, with an estimated 8850 new cases and 410 deaths in 2017 alone.^[2] According to the American Urological Association, the prevalence of hydrocele is 1% among adult males.^[4] Meanwhile, annually, testicular torsion impacts 3.8 of every 100,000 men who are younger than 18 years.^[5] In Brazil, moreover, a study was done on men of 40 years old or over, who were undergoing a prostate cancer screening program. This found that 10.1% of them suffered from spermatoceles.^[6]

In Saudi Arabia, there is a noticeable increase in the incidence of testicular cancer, which reached an annual rate of 94 cases in 2013.^[6] There are, nevertheless, a limited number of studies regarding this subject in a Saudi Arabian setting. Therefore, the primary goal of this study was to assess both the prevalence and level of awareness of testicular masses in Saudi Arabia, thereby leading the way for other research opportunities in this area.

Table 2: Knowledge of testicular cancer (n=3502)

Questions	Responses/answers	n (%)
Do you have enough knowledge about testicular swelling?	Yes	828 (23.7)
	No	2672 (76.3)
Rate how dangerous testicular mass are? (1 is harmless and 5 is very harmful)	1	87 (2.5)
	2	237 (6.9)
	3	1109 (32.2)
	4	1047 (30.4)
	5	963 (28)
What is the 1 st impression come to your mind when you experience a swollen testicle?	Tumor	1129 (32.3)
	Benign mass	585 (16.7)
	Lipoma	522 (14.9)
	Varicocele	616 (17.6)
	Spermatocoele	214 (6.1)
	Orchitis epididymitis	225 (6.4)
	Hydrocele	209 (6)
From your opinion, what is the most important reason to consult a doctor when you have testicular swelling?	The swelling	940 (26.9)
	The fear that swelling can cause infertility	1289 (36.8)
	Pain	946 (27)
	Cosmetic	158 (4.5)
	The fear that the swelling might be infectious	167 (4.8)
Do you believe testicular swelling is treatable?	Yes	1921 (54.9)
	No	580 (16.6)
	May be	999 (28.5)
Are all testicular swellings considered tumors?	Yes	326 (9.3)
	No	2098 (59.9)
	May be	1076 (30.7)
What are the reasons that may prevent you from going to the doctor regarding testicular problems?	Fear of being dangerous	549 (15.7)
	Embarrassment	1340 (38.3)
	Not important	406 (11.6)
	I don't mind	1182 (33.8)
	5	24 (0.7)
Do you believe that testicular swelling can be fatal, god forbid?	Yes	1523 (43.5)
	No	1977 (56.5)
Do you know someone who died from swelling of the testicle?	Yes	274 (7.8)
	No	3226 (92.2)

MATERIALS AND METHODS

Sampling and sample size

A descriptive, cross-sectional, web-based survey employed a quantitative method of collecting data, through a questionnaire that measured the awareness of testicular swelling among young adult males in the Kingdom of Saudi Arabia. A representative sample ($N = 3502$) of participants took part in the survey. The study was conducted from August 2021 to March 2022.

Preparing the study instrument

After an intensive literature review and consultation with other experts in this area, the researchers and research supervisor developed a structured questionnaire. The data collected included the person's sociodemographic information such as age, gender, education, and marital status. The main survey then consisted of 22 items, which measured the participants' awareness of testicular swelling. The assessment covered areas such as general definition, signs and symptoms, age of incidence, self-examination

methods, and curability. In addition, the participant's attitude toward testicular swelling was also assessed in the questionnaire.

Data management

After the data were extracted, it was revised, coded, and fed into statistical software, namely, IBM SPSS version 22 (SPSS, Inc. Chicago, IL, USA). All statistical analyses were undertaken using two-tailed tests. $P < 0.05$ was considered statistically significant. For awareness items, each correct answer was scored one point, with a total summation of the discrete scores of the different items, and then calculated. A patient who scored less than 50 (2 points) of the maximum score was considered to have poor awareness, while good awareness was considered if he had a score of 50% or more (3 points or more) of the maximum. Descriptive analysis based on frequency and percent distribution was then done for all variables, including demographic data, awareness items, and attitude. The results of the study were presented in the form of tables, graphs, and pie charts.

Quality control

Reliability of data

Before starting the actual data collection process, the questionnaires were pre-tested. Ten males were randomly chosen from various age groups to test the study tool. The gaps and problems found by this test were addressed in accordance with simplifying and shortening the questions. The questionnaire was presented once to each of the respondents.

Validity of data

The questionnaire that was chosen to collect data was designed with the help of the research supervisor to ensure that all necessary information was included and that the objectives of the study were covered.

Ethical consideration

Ethical approval was obtained from the Medical Research Ethics Committee at Hail University. Informed consent was obtained from respondents before administering the questionnaire to them, with all ethical issues addressed prior to their participation.

RESULTS

A total of 3502 participants from different regions of Saudi Arabia responded to our survey. Responses were collected for 43 days, from August 21, 2021 to October 3, 2021. All respondents completed the survey, giving a response rate of 100%. The demographic information collected from respondents included age, gender, region,

nationality, marital status, educational level, and residence. The results are detailed below.

Age of respondents

About 44.1% of participants ($n = 1542$) were between 18 and 25 years, 26.7% ($n = 934$) were 25–30 years, 14.6% ($n = 511$) were between 30 and 40 years, 8.5% ($n = 296$) were 40–50 years, while 2.4% ($n = 85$) were <18 years. 3.8% ($n = 132$) were older than 50, and therefore, excluded from the study [Table 1 and Figure 1].

Gender of respondents

: 87% ($n = 3042$) of the participants were male, while 13% ($n = 455$) of them were female [Table 1 and Figure 2].

Region of participants

From first to last, participants were from Mecca 17.4% ($n = 608$), then Riyadh 14.9% ($n = 523$), Medina 11.9% ($n = 418$), Eastern Province 8.5% ($n = 296$), Al-Qassim 7% ($n = 245$), Asir 6.5% ($n = 228$), Tabuk 6.5% ($n = 226$), Najran 5.5% ($n = 192$), Jizan 5.3% ($n = 184$), Al-Jawf 5.2% ($n = 183$), Ha'il 4.4% ($n = 154$), Northern Borders 4.1% ($n = 143$), and Al Bahah 2.9% ($n = 100$) [Table 1 and Figure 3].

Nationality of participants

42.3% of participants ($n = 3242$) were of Saudi nationality, while 57.7% ($n = 258$) were nonSaudi [Table 1].

Marital status

42.5% ($n = 1479$) of the participants were married, while 57.7% ($n = 2021$) were unmarried [Table 1 and Figure 4].

Educational level

68.2% ($n = 2388$) of the respondents were educated to a Bachelor's level, 21.2% ($n = 743$) high school, 7.7% ($n = 271$) Master's/PhD, 1.9% ($n = 67$) elementary or intermediate, and last 0.9% ($n = 31$) culprit/uneducated [Table 1].

Residence

86.5% ($n = 3026$) of the participants lived in an urban area, while the rest were from a rural area 13.5% ($n = 474$) [Table 1].

Knowledge about testicular swelling

To evaluate respondents' knowledge about testicular swelling, we asked them if they have enough knowledge about testicular swelling. 76.3% ($n = 2672$) of the respondents reported that they do not have enough knowledge about testicular swelling, while 23.7% ($n = 828$) reported that they do. We asked them also to rate how dangerous testicular masses were from 1 to 5, where 1 is

harmless and 5 is very harmful. 43.2% ($n = 1109$) rated testicular mass as 3 out of 5, 30.4% ($n = 1047$) rated it as 4 out of 5, 28% ($n = 963$) as 5 out of 5, 6.9% ($n = 237$) as 2 out of 5, and 2.5% ($n = 87$) as 1 out of 5 [Table 2].

Impression about testicular swelling

32.3% of participants ($n = 1129$) reported that the first thought which comes to their minds if they experience a swollen testicle is that it is a tumor. 17.6% ($n = 616$) reported that their initial thought was varicocele, 16.7% ($n = 585$) benign mass, 14.9% ($n = 522$) lipoma, 6.4% ($n = 225$) orchitis epididymitis, 6.1% ($n = 214$) spermatocele, and 6% ($n = 209$) hydrocele [Table 2].

Most important reason to consult a doctor

36.8% ($n = 1289$) reported that in their opinion, the most important reason to consult a doctor is the fear that the swelling may cause infertility. 27% ($n = 946$) reported that it was pain, 26.9% ($n = 940$) reported that the swelling itself is the most important reason, 4.8% ($n = 167$) reported that the fear that it might be infectious is the most important reason, while 4.5% ($n = 158$) reported that cosmetic issues are the most important reason for consulting a doctor [Table 2].

Ability to treat a testicular swelling

54.9% of respondents ($n = 1921$) thought that testicular swellings are treatable, while 16.6% ($n = 580$) thought they are not. 28.5% ($n = 999$) thought they might be treatable [Table 2].

Are all testicular swellings considered tumors?

When we asked the respondents this question, 9.3% ($n = 326$) answered yes, while 59.9% ($n = 2098$) answered no; 30.7% ($n = 1076$) thought they may be tumors [Table 2].

Reasons which prevent going to the doctor regarding testicular problems

38.3% ($n = 1340$) of the respondents reported that embarrassment might prevent them from going to the doctor for testicular problems. 15.7% ($n = 549$) reported that the fear that it may be dangerous may prevent them, 11.6% ($n = 406$) thought that testicular problems are not important, 33.8% ($n = 1182$) reported that they do not mind going to the doctor for testicular problems, while 0.7% ($n = 24$) reported that negligence may be the reason [Table 2].

Fatality of testicular swellings

43.5% ($n = 1523$) thought that testicular swelling can be fatal, while 56.5% ($n = 1977$) thought it cannot be. Moreover, we also asked the respondents if they know someone who has died from swelling of the testicle.

Table 3: Selected characteristics of the sample, and the association with awareness level

Factor	Awareness level		P
	Good, n (%)	Bad, n (%)	
Age			
<18	38 (44.7)	47 (55.3)	0.001
18-25	964 (62.5)	578 (37.5)	
25-30	545 (58.4)	389 (41.6)	
30-40	278 (54.4)	233 (45.6)	
40-50	168 (56.8)	128 (43.2)	
>50	83 (62.9)	49 (37.1)	
Gender			
Male	1810 (59.5)	1232 (40.5)	0.610
Female	265 (58.2)	190 (41.8)	
Region			
Riyadh	296 (56.6)	227 (43.4)	0.000
Mecca	373 (61.3)	235 (38.7)	
Eastern province	190 (64.2)	106 (35.8)	
Medina	281 (67.2)	137 (32.8)	
Al-Qassim	121 (49.4)	124 (50.6)	
Tabuk	107 (47.3)	119 (52.7)	
Al-Jawf	81 (44.3)	102 (55.7)	
Al Bahah	75 (75.0)	25 (25.0)	
Asir	134 (58.8)	94 (41.2)	
Northern borders	99 (69.2)	44 (30.8)	
Jizan	112 (60.9)	72 (39.1)	
Ha'il	92 (59.7)	62 (40.3)	
Najran	115 (59.9)	77 (40.1)	
Nationality			
Saudi	1918 (59.2)	1324 (40.8)	0.513
NonSaudi	158 (61.2)	100 (38.8)	
Marital status			
Married	766 (51.8)	713 (48.2)	0.000
Unmarried	1310 (64.8)	711 (35.2)	
Educational level			
Elementary/intermediate	33 (49.3)	34 (50.7)	0.000
High school	355 (47.8)	388 (52.2)	
Bachelor's	1471 (61.6)	917 (38.4)	
Master's/PhD	200 (73.8)	71 (26.2)	
Culprit/uneducated	17 (54.8)	14 (45.2)	
Residence			
Urban	1849 (61.1)	1177 (38.9)	0.000
Rural	227 (47.9)	247 (52.1)	

All associations were examined with χ^2 analyses. Table presents the descriptive statistics of the investigated variables and their association

7.8% ($n = 274$) said yes, while 92.2% ($n = 3226$) said no [Table 2].

Table 3 shows that most of the participants (59.2%) of them were Saudi with a good level of awareness of testicular swelling, whereas the participants with a poor level of awareness of testicular swelling were nonSaudi accounted (38.8%). Moreover, there was no statistical significance difference between the nationality of the participants and their awareness level status of them ($P = 0.513$) [Table 3].

The table shows that men made up (3042) 87% of the sample's 3502 participants, while women made up (455) 13%. When comparing differences in gender, 59.5% of

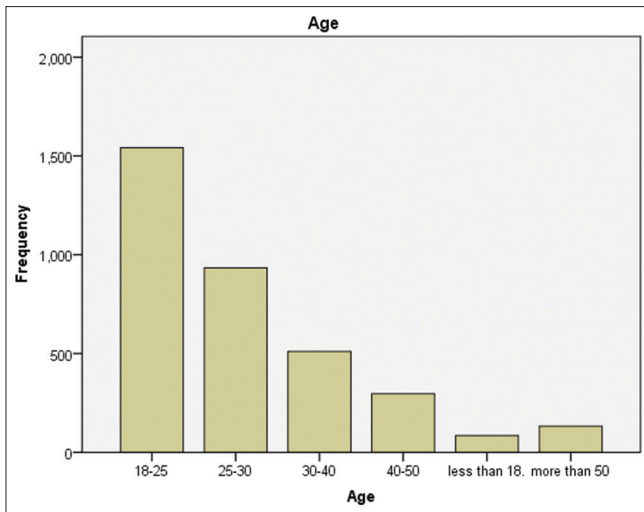


Figure 1: Age of the respondents

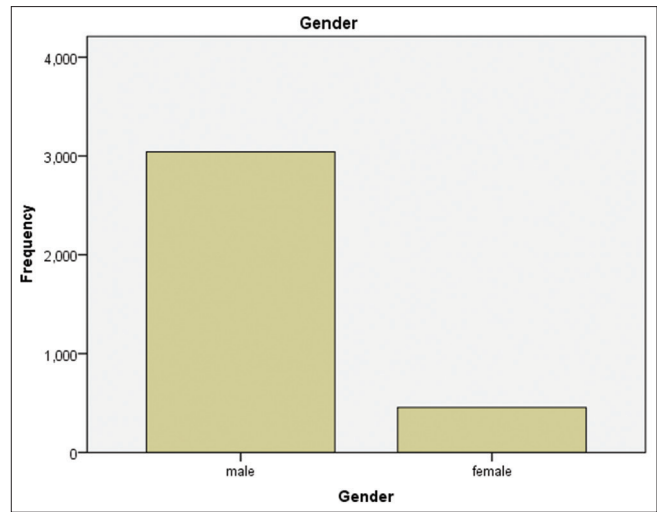


Figure 2: Gender of the respondents

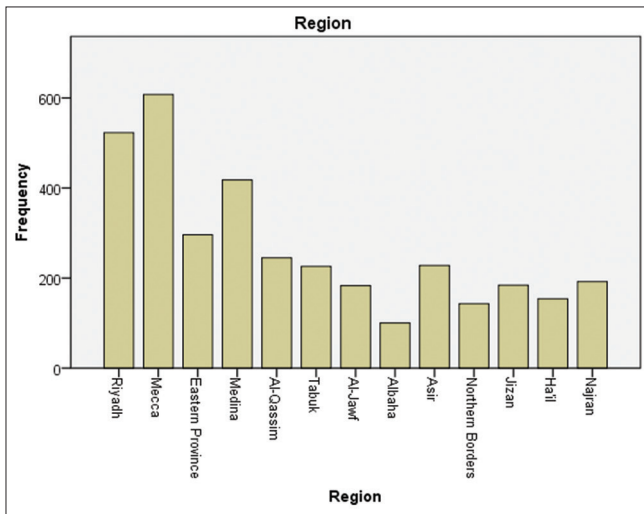


Figure 3: Regions of the respondents

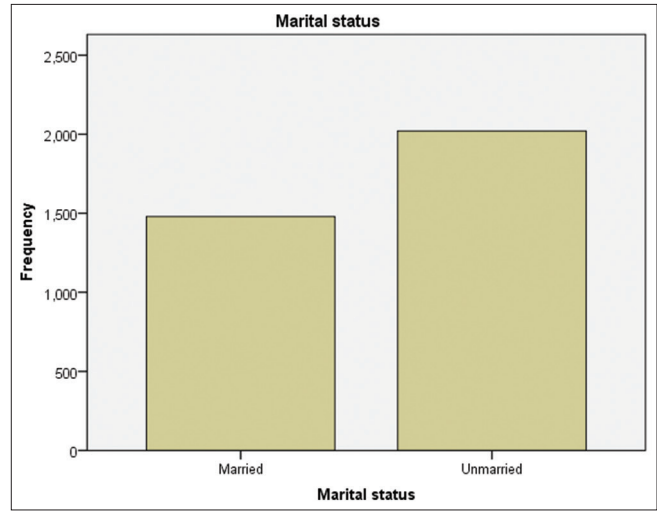


Figure 4: Marital status of the respondents

male participants with good awareness, 58.2% of female participants with good awareness, ($P = 0.610$). There are no notable variations between these factors. As a result, do not differ statistically significantly, [Table 3].

The table shows that there are statistically significant differences for the variables: age, residency, region, marital status, educational level) at the participants' awareness level, where it was ($P = 0.000$) for each variable, [Table 3].

DISCUSSION

The goal of this study was to evaluate the level of societal awareness of scrotal swelling in adult males in the Kingdom of Saudi Arabia and the factors affecting awareness levels.

We reported that the first impression of 17.6% of participants faced testicular swelling would be to think

that it is a varicocele. In a study conducted in 2019 on male athletes in the Riyadh region, Hariri *et al.* reported that 41% of the study population had never heard about varicocele, though 76.4% of the patients who reported knowledge regarding varicocele defined it correctly. On examining 48 of their respondents, 35.4% were diagnosed with left varicocele and 10.4% were diagnosed with bilateral varicocele.^[7] Moreover, in our study, we found that 36.8% of participants feared that all testicular swelling can cause infertility, while 69.8% of participants in Hariri *et al.*'s study thought that varicocele could lead to infertility.

Abomelha found that the annual rate of testicular cancer is increasing, reaching 94 cases in 2013, with those affected aged between 15 and 93.^[6] This low prevalence of testicular cancer in Saudi Arabia might be the reason why most (59.9%) participants in our study think that not all testicular swellings

are tumors. Furthermore, 54.9% thought that testicular swellings are treatable and 92.2% believe that testicular swellings are not fatal. Regarding seeking medical advice for testicular swelling, due to the social and cultural sensitivity surrounding discussions of genitalia in Saudi society, it is not unexpected that 38.3% of our participants admitted that embarrassment was the reason preventing them from visiting a doctor regarding their testicular swelling.

This is the first study of its kind in Saudi Arabia. Testicular swelling is an important topic to understand in regard to the general health of the Saudi population and to prevent the serious consequences that can arise from the late detection of serious etiologies. Hence, further detailed studies should be done in this field.

This study fills an important research gap, which exists due to the lack of cross-sectional studies in the Kingdom of Saudi Arabia that indicate the extent of the swelling of the scrotum, in addition to the lack of health education programs related to the scrotum due to the cultural sensitivity which surrounds the discussion of the genitals. This made the learning process more complicated, as did the different cultures of the local community. Such factors contribute to the low awareness of the community about the symptoms and complications of testicular swelling, the importance of examination and health follow-ups to prevent testicular complications that may lead to infertility/ the inability of the testicle to produce testosterone, along with the lack of awareness regarding self-examination. These issues result in increases in the prevalence of testicular swelling and delays in taking the necessary measures and medical interventions in a timely manner when faced with testicular swelling, which may, in turn, pose a threat to individuals and society.

This study has limitations too, however. The first limitation is that the study targeted only advanced (A) level students. Some males who were eligible for the study were left out, because they are in ordinary (O) level at Ntare School, yet they have the same risk of testicular cancer. The second limitation is that it is difficult to determine the temporal relationship of testicular swelling, in addition to the susceptibility of recall bias, along with the presence of the possibility of bias in the rate of infection and prevalence, as cases with early deaths and individuals who had been exposed in the past were missed.

CONCLUSION

The study results indicate that there is an increase in proliferation (scrotal swelling) and its complications such as testicular cancer. In addition, the results indicate a correlation between the low level of community awareness about scrotal swelling, its causes, symptoms, treatment methods and complications, along with demographic and social factors. Given the prevalence of scrotal swelling and low community awareness, these findings should prompt further investigation and attention, especially from urologists, andrologists, and nurses. It is essential to inform patients and the wider public about the importance of follow-up and screening, as well as teach them the simple early detection technique of testicular self-examination. The study thus emphasizes the importance of activating outpatient and inpatient education campaigns, in addition to encourage further research using cases collected from medical records, to assess future trends in the prevalence of scrotal swelling, as well as to identify risk factors.

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Nil.

Conflicts of interest

There are no conflicts of interest

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