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Cognizance of hernia risk factors among adult in northern region, Saudi Arabia: A cross sectional study

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ABSTRACT

Objective: Global public awareness on the risk factors of abdominal wall hernia is limited, this is particularly scanty in our region. The purpose of this study is to examine the knowledge and awareness about risk factors of abdominal wall hernia among the citizens of the northern regions, in Kingdom of Saudi Arabia. *Method:* In this cross-sectional, community-based study 1037 citizens were surveyed using an online questionnaire composed of 15 questions. *Result*: About one-third (34.2%, n=355) had a good knowledge about hernia. However, more than half of the participants (54.3%, n = 563) showed poor level of knowledge, while only (13%, n=135) had a satisfactory level of knowledge about hernia. Satisfactory knowledge was observed in the age group between 18-25 years (18.1%, *n* = 365) compared to the other aged groups. *Conclusion:* There was significant incognizance about hernia among older populations of Northern regions. Future studies on adult education and public awareness, is imperative.

Keywords: Hernia, knowledge, awareness, risk factors.

1. INTRODUCTION

A hernia of the abdominal wall is a protrusion of viscus or part of a viscus through a weak part in the abdominal wall (Williams et al., 2013). It occurs when an organ or a fatty tissue passes through a spot in an encompassing muscle or connective tissue (fascia) (Al Hassan et al., 2018). In a normal abdominal wall, the strength of the different muscle layers is sufficient to resist any herniation of its content. However, a high abdominal pressure from straining due to constipation, prostatic symptoms, excessive coughing and obesity, can result in hernia (Henriksen et al., 2020). Inguinal hernia is the most common type in adult comprising 80% of all hernia repairs. Other types of hernia include epigastric hernia, umbilical hernia, para-umbilical, incisional hernia and femoral hernia. One of the more common types of hernias is an inguinal hernia, followed by a femoral hernia and an umbilical hernia

(Matsumoto et al., 2018).

Hernia has been well established as a gender-specific disorder. Several studies have shown that men are at a higher risk of developing inguinal hernias than women (AAssakran et al., 2020) as in the study conducted in Mosco showed 14.6% and 31.2% of the women and men respectively had these conditions (Sazhin et al., 2019). Also, the study which was conducted in Northwest Ethiopia showed that external hernia in male and female groups was 11.73% (95% CI 7.59% to 17.09%) and 11.59% (95% CI 7.57% to 16.76%) (Kibret et al., 2022).

Most abdominal hernias are asymptomatic; however, when patient's intra-abdominal pressure is increased in response to coughing, bending over, or lifting heavy weights, a swelling and uncomfortable bulging and heavy feeling occurs. A hernia could be reducible or irreducible; the former occurs when the tissue is return into the abdomen while the latter occurs when the hernia content cannot be reduced inside the abdominal cavity. If hernial content blood supply is impaired, the hernia becomes strangulated resulting in a serious and fatal complication (AAssakran et al., 2020). A hernia can develop after an abdominal muscle weakened due to many events such as inability of abdominal muscle to close properly or injury after surgery or a chronic cough. It can also happen due to various risk factors such as pregnancy, weight loss and smoking. A side from these, it can also occur because of various conditions such as diabetes and asthma (Alkhalaf et al., 2022; Albukairi et al., 2018). Studies revealed that overweight or obesity is a much higher risk of hernias development than using steroids. It also found that smoking might contribute to the development of inguinal hernia, In addition to the link between heavy lifting and inguinal hernia. Some of these include diabetes and asthma (Albukairi et al., 2018).

Hernia can essentially affect quality of life due to self-esteem, image, employability among affected individuals. For instance, another study revealed that hernia can cause five main issues to the patents represent as: Body image, mental health, symptoms, interpersonal relationships and employment. People with a chronic or recurrent gastrointestinal or other related condition such as a hernia often experience issues with mobility and bending. They noted the need to adapt to a variety of activities, including walking, adapting to a new stance and picking up objects. They also experienced overwhelming frustration due to the symptoms of their condition like low mood, depression, anxiety. Thus, hernias can affect the quality of lives in many aspects (Ahmed Alenazi et al., 2017; Smith et al., 2022). Mosco study revealed that 20.9% of the population had abdominal wall hernias. In addition, umbilical hernias were found in 10.2%, 8.3% had groin hernias and in the last, incisional in 2.4% (Sazhin et al., 2019). While the Ethiopia study revealed that 11.7% of the population had external hernias. The commonest type was found to be epigastric hernia (34%), followed by the inguinal hernia (29.8%). Other conditions such as chronic cough, old age, constipation and heavy objects lifting were statistically have significant association with this condition (Kibret et al., 2022).

In Saudi Arabia, reports on hernia and its complications are limited. However, the study conducted in Arar city to investigate abdominal hernia prevalence. Out of the 1,567 individuals screened, about 11% had abdominal hernias, the majority (54.2%) were women (AhmedAlenazi et al., 2017). In 2021, another study was conducted to investigate abdominal hernia among adults in Saudi Arabia. The study revealed that the overall prevalence of this condition was 38.8%; however, in participants aged 18 to 25 showed a rate of 21.8% (Mahfouz and Al-Juaid, 2021). A variety of interventional treatment strategies can be used to treat a hernia, including surgery but depend on its complexity for example, according to some studies, timing surgery is essential in the repair of abdominal hernias in people with cirrhosis (AAssakran et al., 2020).

To our knowledge, there are no surveillance studies about hernia in northern region in Saudi Arabia. We aim to measure the awareness of the participants about abdominal hernia, its causes and expected complications and evaluate the knowledge and attitude of adults in the north region, Saudi Arabia regarding the risk factors of hernia.

2. METHOD AND MATERIALS

Study design

In this qualitative, cross-sectional, community-based study 1037 adults were included. A 15 items questionnaire was constructed after a thorough review of literature for the collection of data relevant to our study objectives. The questions were to evaluate the level of awareness about the risk factors of abdominal hernias. The questionnaire was piloted on 10 volunteers out of the study sample and some necessary corrections were done. The study was conducted on 17/05/2022. This study has been reviewed and approved by Research Ethic Committee (REC) at college of medicine, University of Hail, number of approval (H-2022-236).

Study population

The sample was taken from general population of Hail region, Saudi Arabia. Inclusion Criteria:

Both genders

Adults 18 years and older
Saudis who reside in Hail region, Saudi Arabia. Including both urban and rural areas

Statistical Analysis

Data entry and statistical analysis were performed using the statistical Package for Social Sciences (SPSS) software, version 26. Categorical variables were described utilizing frequency and percentage. Test for the association between level of knowledge and its associated factors was done using Chi-square test and statistical significance was determined at $p<0.05$ (Assar et al., 2022). The study included 1037 individuals.

Sample collection

Collection of data from the sample was accomplished using randomly self-administered online questionnaire. A pre-validated pre-translated questionnaire was used from a different study. After giving the consent to participate in this study, participants are asked to fill a questionnaire that consists of two sections. The first section is the personal data including (Name, gender, age, and level of education). The second part addressed knowledge of risk factors of hernia and had eight domains discussing multiple risk factors (asthma, lifting heavyweight, constipation, smoking, enlarged prostate, pregnancy, previous surgeries and diabetes) All the data that have been used in this study were kept private to establish the confidentiality of the study.

Ethical considerations

The research will be only conducted if research gets the ethical approval from the Ethical Committee, University of Hail.
Written informed consent form will be filled by all participants before their enrollment in the study.
The enrollment of participants to the study is completely voluntary.
Participants have autonomy to withdraw from the study at any point of time.
Confidentiality of identifying data will be maintained.

3. RESULTS

Demographic characteristics

As illustrated from Figure 1 and table 1, about one-third (34.2%) of the respondents perceived themselves as having good knowledge about hernia whereas 20.4% and 19.6% perceived themselves as having no knowledge or excellent knowledge regarding hernia, respectively

Table 1 Participants demographics (n=1037)

Variables	Frequency	Percentage
Age in years		
18-25	365	35.2
26-35	228	22.0
36-45	234	22.6
46-55	130	12.5
56-65	46	4.4
66-75	22	2.1
>75	12	1.2
Gender		
Male	515	49.7
Female	522	50.3
Educational level		
Primary school	68	6.6
Intermediate school	68	6.6
High school	227	21.9
University	674	64.9

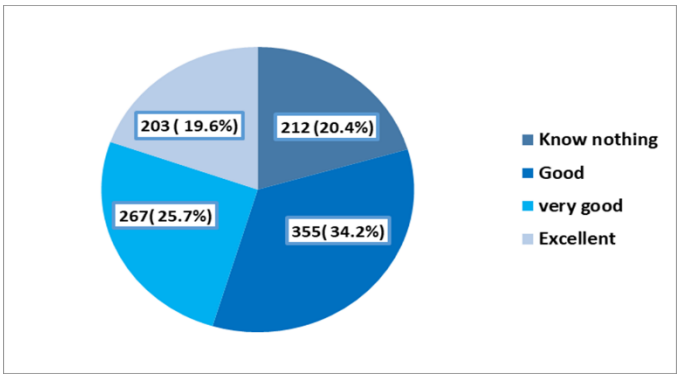

Figure 1 Self-perceived knowledge about hernia

Assessment of participants` knowledge about hernia

From Table 2, it is evident that almost two-thirds of the participants could recognize lifting heavy objects (68.9%) and pregnancy/labour (63.5%) as risk factors for hernia while smoking, straining at micturition, bronchial asthma and enlarged prostate were recognized as risk factors for hernia by 26.3%, 28.9%, 30.7% and 32.1% of the participants, respectively. On the other hand, 35.3% of the participants knew correctly that diabetes mellitus is not a risk factor for hernia. About two-thirds of the participants (65.1%) knew that hernia leads to serious complications. Overall, more than half of the participants (54.3%) had poor level of knowledge whereas only 13% had satisfactory level of knowledge about hernia as displayed in Figure 2.

Table 2 Participants` responses to knowledge statements about hernia risk factors and consequences

Knowledge statements	Right answers	
	No.	%
Risk factors for developing hernia include		
Heavy lifting (Yes)	714	68.9
Constipation (Yes)	418	40.3
Bronchial asthma (Yes)	318	30.7
Smoking (Yes)	273	26.3
Straining at micturition (Yes)	300	28.9
Pregnancy and labour (Yes)	658	63.5
Surgery (Yes)	533	51.4
Diabetes mellitus (No)	366	35.3
Enlarged prostate (Yes)	333	32.1
Prognosis of hernia		
Hernia leads to serious complications (Yes)	675	65.1

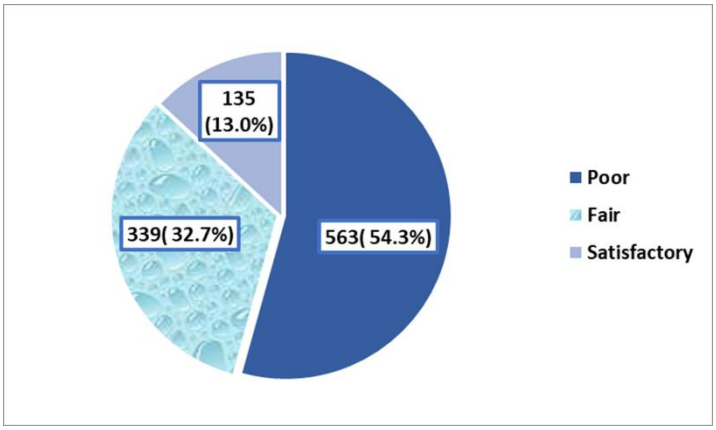

Figure 2 Overall level of knowledge of the participants about hernia risk factors and consequences.

Factors associated with level of cognizance about hernia

The best satisfactory knowledge was observed in the age group 18-25 years (18.1%) compared to the other aged groups, p=0.001. Regarding the association degree of the educational level with the knowledge about hernia, University and Primary school groups were the poorest levels (48.6 %) and (58.8 %) respectively in comparison with the rest groups, p<0.001. On the other hand, the change in the rate of satisfactory knowledge between the male and females' groups was statistically non-significant, 13.6% and 12.5% respectively, p= 0.096 as shown in Table 3.

Table 3 Demographic factors and level of knowledge about hernia.

	Level of knowledge about hernia			p-value*
	Poor N=563 N (%)	Fair N=339 N (%)	Satisfactory N=135 N (%)	
Age in years				
18-25 (n=365)	177 (48.5)	133 (33.4)	66 (18.1)	
26-35 (n=228)	127 (55.7)	73 (32.0)	28 (12.3)	
36-45 (n=234)	136 (58.1)	76 (32.5)	22 (9.4)	
46-55 (n=130)	64 (49.3)	48 (36.0)	18 (13.8)	
56-65 (n=46)	31 (67.4)	15 (32.6)	0 (0.0)	
66-75 (n=22)	18 (81.8)	4 (18.2)	0 (0.0)	
≥76 (n=12)	10 (83.4)	1 (8.3)	1 (8.3)	0.001
Gender				
Male (n=515)	293 (56.9)	152 (29.5)	70 (13.6)	
Female (n=522)	270 (51.7)	187 (35.8)	65 (12.5)	0.096
Educational level				
Primary school (n=68)	40 (58.8)	15 (22.1)	13 (19.1)	
Intermediate school (n=68)	47 (69.1)	16 (23.5)	5 (7.4)	
High school (n=227)	149 (65.7)	55 (24.2)	23 (10.1)	
University (n=674)	327 (48.6)	253 (37.5)	94 (13.9)	<0.001

*Chi-square test

4. DISCUSSION

This study focusses in the knowledge and awareness about hernia risks in adults' population in the Northern region of Saudi Arabia, 1037 participants of all genders of various ages and educational levels were included. The ages of our participants varied from 18 to 75 years, 522 (50.3%) participants were females and 515 (49.7%) were males, other comparative study enrolled 100 Saudi Arabian participants from both genders (62% Males and 38% Females) (Albukairi et al., 2018). In another study conducted on Saudi Arabia population included 500 participants 65% were females and 35% were males. The participant ages were 29.2% (18 -25 years), 35.3% (26 39%), 31.0% (40 59%) and 4.5% (60 years and above) (Mahfouz and Al-Juaid, 2021). A Russian study included 783 participant most of them were women 485 (62%) and only 298 (38%) men (Sazhin et al., 2019). The educational level of our participants varied with age group and social level. Level of education included University and High school, Intermediate and Primary school, 674 (64.9%) participants were university graduates, 227 (21.9%) high school, 68 (6.6%) Intermediate school and 68 (6.6%) were primary school. Compared to 7%, 17%, 71% and 15% for middle, high school, college students and graduates respectively (Albukairi et al., 2018).

In this study, most participants (54.3%) showed a poor knowledge of hernia and its risks. 714 (68.9%) of the participants aware that lifting heavy objects is risk for hernia, 658 (63.5%) of the participants were aware that pregnancy and labor are risk factors for hernia. These are in line with an earlier study in which (87%) of the participants were aware about the relation between hernia and heavy lifting, with (65% and 62%) know that pregnancy and surgery are contributing factor for hernia respectively (Albukairi et al., 2018). More than half of this study's participants 533 (51%) recognized surgery as one of the risks for developing hernia, this is consistent with other studies that was done in Riyadh, Eastern region and Al-jouf which showed that 62%, 52.5%, 86% of the participants refer to surgery as a risk for developing hernia (Al Hassan et al., 2018; Alkhalaf et al., 2022; Albukairi et al., 2018). A 318 (30.7%) of the participants recognized bronchial asthma as a risk for hernia and 418 (40%) recognized constipation as a risk for

development hernia, like Al-jouf study in which 59% of participants refer to bronchial asthma as a risk factor for hernia and only 19% referred to constipation as a risk factor (Al Hassan et al., 2018).

In this study, 273 (26.3%) of the participants referred to smoking as a risk factor for developing hernia, which indicates a poor knowledge about the risk of smoking in development of hernia, this is also consistent with a study done in Eastern region which concluded that only 12.5% of the candidates referred to smoking as risk factor for hernia (Alkhalaf et al., 2022). Our research has shown that the demographic factors have a large impact on the knowledge toward hernia risk factors as most satisfactory level of knowledge came from the age group18 to 25 by (18.1 %) which in line with Al Qassim study which showed that ages from 22 to 28 years have a higher knowledge of abdominal hernia compared to other age groups which could explained by fact that most graduated participants were from this age group (AAssakran et al., 2020). The male participants had a satisfactory level of knowledge (13.6 %) in comparison to female (12.5%), this may be explained that males have a higher prevalence of hernia (48.1%) compared to females (33.9) that reflect on participants knowledge on hernia risk factors (Mahfouz and Al-Juaid, 2021; Sazhin et al., 2019).

In general, most of the participants in Hail 54% had a poor level of awareness of information related to risk factors of hernia with only 13% showed a satisfactory level of knowledge. This calls attention to conduct more research and provide advice to the general population about risk factors of hernia.

5. CONCLUSION

Abdominal wall hernias are a common condition affecting all ages and both sexes in Northern Saudi Arabia. However, the significant incognizant among older portions of the population about the risks and complications of hernia is worrisome and warrants further studies and targeted educational programs. The increased knowledge of youth about hernia is encouraging. Awareness toward hernia should be increased to manage the causes predisposing to the condition and reduce the recurrence of it in general population.

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Author Contributions

All authors above have participated equally in collecting the data, analyzing the data, writing the manuscript and reviewing the article.

Ethical approval

This study has been reviewed and approved by the Research Ethic Committee (REC) at University of Hail dated: 17/05/2022. No. of Research H-2022-236

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Conflict of interest

The authors declare that there is no conflict of interests.

Data and materials availability

All data sets collected during this study are available upon reasonable request from the corresponding author.

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