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Knowledge, practice, and negligence of Breast Cancer screening among women in Jeddah

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ABSTRACT

Background: Breast cancer is the most common cause of mortality among women in the world, and in Saudi Arabia. Screening of breast cancer is important for treatment, and reducing mortality among breast cancer patients. This study aimed to assess the level of knowledge, practice, and identify the reasons behind negligence of breast cancer screening among women. *Methodology:* A cross-sectional study was conducted on women living in Jeddah. The tool for collecting data was an online questionnaire distributed among women through social media. Specific sections in the questionnaire tested the participants' knowledge, and frequency of practice breast cancer methods. In the final section participants expressed why they neglect to screen for breast cancer. *Results:* The research recruited 842 individuals, 93.5 percent of whom were Saudi. 65 percent of participants were between the ages of 20 and 30. Breast self-examination was mentioned by 87.3 percent of women. 58.4% taught about breast self-examination. 23.9% of participants had low knowledge score of breast cancer screening, 41.9% had moderate knowledge score, and 34.2% had high knowledge scores. 90.7% of participants had bad practice towards breast cancer screening, 6.4% had fair practice, and only 2.9% had good practice. Participants' knowledge score was significantly correlated to their age, a nation and jobs. *Conclusion:* The conclusion, Saudi women had a poor level of knowledge about breast-cancer screening. Nevertheless, screening best practices were observed. Breast cancer awareness programs on the warning signs, symptoms, screening, and prevention should be started, especially at the local level.

Keywords: Breast Cancer, Screening, Breast self-examination, Clinical breast examination, Mammography.

1. INTRODUCTION

Breast cancer (BC) is the most common form of cancer among women and the second most common cancer globally (Al-Ghadeer et al., 2021; Nour et al., 2023). In developed countries, breast cancer rates are usually high, but recently they've been increasing in almost every part of the world. The prevalence of this condition varies between 1 and 2 percent in developed nations, with an annual increase of about 5 percent in developing nations (Ismail and Ravi, 2021). The Saudi cancer institute, breast cancer affected 16.7% of all cancers among Saudi citizens in 2015 and was the most common malignancy in women (Alqahtani et al., 2021).

According to studies, more than half of newly diagnosed cases of breast cancer in many Arabic nations were women under the age of 50 (Al-Mousa et al., 2020). Patients typically present with an advanced stage of the disease, and the majority of cancer patient fatalities are linked to a delayed diagnosis particularly for developing countries (Solikhah et al., 2021). 252,710 new cases of cancer in women were diagnosed in America in 2017; 30% of these instances were breast cancer diagnoses (Sun et al., 2017). The knowledge-lack about cancer-screening may be caused by a number of factors, such as widespread misconceptions and anxieties about cancer and its treatment as well as a lack of awareness about cancer prevention (Anwar et al., 2018).

Therefore, it's important to stress routine screening for breast cancer and educate the general public (Basri et al., 2023; Gouse et al., 2022). Self-examination, clinical breast examination, and mammography are the three most popular and widely utilized breast cancer-screening techniques worldwide (Manzour and Gamal Eldin, 2019). The number of conducted studies related to our topic, especially in the city of Jeddah was very few and almost none of them were conclusive for all three important screening methods for breast cancer. Previous studies have also failed to identify the reasons why some women might underestimate the importance of screening. Our study's objective is to assess the knowledge, practice, and negligence of breast-cancer-screening among females in Jeddah.

2. METHODOLOGY

This is an observational cross-sectional study conducted May 2022 – March 2023 in Jeddah, west of Saudi Arabia. The study's participants consisted of women who are 18 years old or above living in Jeddah. The sample size of 384 was calculated by Qualtrics calculator with a confidence level of 95% and a 5% margin of error. The inclusion criteria for this study were as follows: Women aged 18 years old or above, and live in Jeddah. Women under the age of 18 years old, outside of Jeddah, and males were excluded from this study.

Data collection

The study tool was used an online structured questionnaire distributed among female participants in Jeddah through social media apps such as WhatsApp, Twitter and Instagram. This tool was developed using a pre-designed questionnaire after consulting experts in research and studies conducted in Saudi Arabia (Heena et al., 2019). The questionnaire contains 33 questions in both Arabic and English languages, divided into four sections: Socio-demographic information, knowledge of breast-cancer screening, practice of breast-cancer screening and the reason for negligence of breast-cancer screening.

The first section contains Socio-demographic background questions. Participants were asked about age, marital state, nationality, education level, employment, smoking habit, menstrual periods and breast cancer history. This was reported in frequencies and percentages.

The second section includes nine questions that will test participants' knowledge of breast cancer-screenings such as the time of screening and how it's done. This section was divided into three parts: Knowledge of breast-self-examination, clinical-breast examination and mammogram. The scoring scale was used here is KAP scoring, so for every question answered correctly one point will be given. As for incorrect answers, missing and "don't know" answers zero points will be given. The final result will be calculated out of total nine points for each participant and then will be classified based on the following Levels of knowledge: (0-3 points = low), (4-6 points = moderate) and (7-9 points = high).

In section number three participants were asked six questions regarding how often they practice breast-cancer screenings. To assess the sufficiency of practice a KAP scoring scale was used. Each participant was given six questions and they had three options to answer with. Any questions answered with "yes" were given two points, questions answered with "sometimes" were given one point and answers with "No" were given zero points. The total amount of score could be achieved is twelve points. There final results were calculated and classified as follows: (0-4 points = poor practice), (4-8 points = fair practice) and (8-12 points = good practice).

Finally, the final section of the questionnaire includes three questions. This section was designed to investigate the reasons behind the negligence of breast-cancer-screening among some women. They were asked about the reason why they refuse to

undergo any of the three screening methods. They were given few possible scenarios to from with the freedom to choose multiple answers. The most chosen answers might give information about the most common reasons why some women avoid breast screenings. The results were reported in frequencies and percentages.

Collected Data was entered on computer using the Microsoft Excel program (2016) for windows. Data was then transferred to the Statistical-Package of Social-Science Software (SPSS) program, version 20. To be statistically analyzed.

3. RESULTS

The study included 842 participants, 93.5% of them were Saudi. 65.9% of participants were 20- 30 years old, 13.2% were less than 20 years old and 9.5% were 31- 40 years old. 66% of participants were single and 29% were married. 56.7% were students and 19% were employees as in (Table 1). The prevalence of breast cancer was 1.9% of participants had previous diagnosis of breast cancer as in (Figure 1).

Table 1 Socio-demographic characteristics of participants (n=842)

Parameter		No.	%
Age	Less than 20	111	13.2
	20 -30	555	65.9
	31- 40	80	9.5
	41- 50	71	8.4
	51 -60	25	3.0
Marital status	Single	556	66.0
	Married	244	29.0
	Divorced	35	4.2
	Widow	7	.8
Nationality	Saudi	787	93.5
	Non-Saudi	55	6.5
Job	Employee	160	19.0
	Student	477	56.7
	Housewife	186	22.1
	Retired	19	2.3

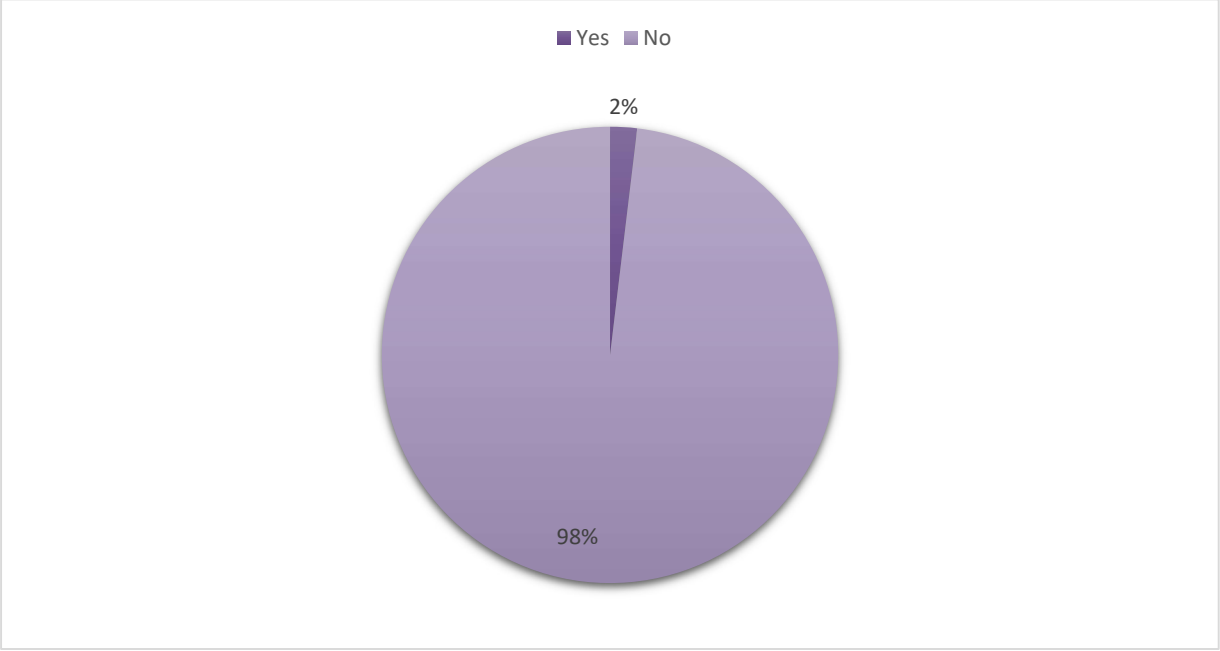

Figure 1 Prevalence of breast cancer among study participants (n= 842)

Table 2 shows that, 8.6% of studied participants were smokers. 77.8% had regular menstruation. 17.6% had a family-history of breast-cancer. 87.4% heard of breast self-examination. 58.4% taught about breast self-examination.

Table 2 Participants' smoking history and knowledge of breast self-examination (n=842)

Parameter	Yes	No
Smoking	72 8.6%	770 91.4%
Regular menstruation	655 77.8%	187 22.2%
Family-history of breast-cancer	148 17.6%	694 82.4%
Heard of breast self-examination	736 87.4%	106 12.6%
Taught about breast self-examination	492 58.4%	350 41.6%

Age at breast self-examination was reported at puberty by 36.5%, from 20 years by 15.2%, and from 30 years by 14.5%. Frequency of breast self-examination was reported monthly by 46.4%. Best time for breast self-examination was reported one week after menstruation by 52.4%. Almost 73% of participants reported that breast self-examination is done by using sensation of the breast using the hand sensation of the armpit using the hand. 90.1% reported that right thing to do when notice that breast self-examination is abnormal is to see a doctor (Table 3).

Table 3 Knowledge of participants of breast self-examination (n=842)

Parameter		No.	%
Age at breast self-examination starts.	Since birth	2	0.2
	At puberty	307	36.5
	From 20 years	128	15.2
	From 30 years	122	14.5
	After menopause	65	7.7
	I don't know	218	25.9
Frequency of breast self-examination performed	Daily	3	0.4
	Weekly	44	5.2
	Monthly	391	46.4
	Annually	126	15.0
	I don't know	278	33.0
Best time for a breast self-examination	One week after menstruation	441	52.4
	During the menstrual cycle	56	6.7
	During pregnancy	6	0.7
	During the lactation period	7	0.8
	I don't know	332	39.4
Who does self-examination	The doctor	68	8.1
	The nurse	19	2.3
	Personally	628	74.6
	I don't know	127	15.1
Breast self-examination using	Sensation of the breast using the hand sensation of the armpit using the hand	614	72.9
	Armpit sensation only	14	1.7
	Doing a mammogram	22	2.6
	Breast ultrasound work	5	.6

	Examination of the breast by looking in the mirror	46	5.5
	I don't know	141	16.7
Right thing to do when notice that breast self-examination is abnormal	See a doctor	759	90.1
	I don't know	59	7.0
	Nothing	9	1.1
	Leave it in God's hands and pray	15	1.8

As in Table 4, 54.8% of participants heard of clinical breast examination. 58% reported that clinical-breast-examination should be done by the doctor. 31.6% reported that clinical examination of the breast is done using mammogram. 44.3% reported that frequency of clinical breast examination if there is family-history of breast-cancer annually.

Table 4 Knowledge of participants of breast clinical examination (n=842)

Parameter		No.	%
Heard of clinical breast examination	Yes	461	54.8
	No	381	45.2
Clinical-breast examination should be done by	By yourself	33	3.9
	Doctor	488	58.0
	Nurse	103	12.2
	I don't know	218	25.9
Clinical examination of the breast is done using	Ultrasound	36	4.3
	By hand	64	7.6
	Mammogram	266	31.6
	All the above	204	24.2
	I don't know	272	32.3
Frequency of clinical breast examination if there is family history of breast-cancer	Every ten years	9	1.1
	Every five years	70	8.3
	Annually	373	44.3
	I don't know	380	45.1
	Daily	10	1.2

As in Table 5, regarding knowledge of mammogram, 58.2% of participants heard of mammogram. 31.8% reported that the appropriate age to start a mammogram is from the age of forty. 28.3% reported that it is an appropriate time to perform a mammogram if there is family history of breast-cancer annually.

Table 5 Knowledge of participants of mammogram (n=842)

Parameter		No.	%
Heard of mammogram	Yes	490	58.2
	No	352	41.8
Appropriate age to start a mammogram	Since puberty	71	8.4
	From the age of twenty	97	11.5
	From the age of forty	268	31.8
	After menopause	81	9.6
	I don't know	325	38.6
Appropriate time to perform a mammogram if there is family-history of breast cancer	Every three years	28	3.3
	Every two years	38	4.5
	Annually	238	28.3
	When a breast mass is discovered during the examination (either a self-examination or a clinical examination)	202	24.0

	I don't know	336	39.9

As for practice, Table 6 shows that 47.7% of participants done a breast self-examination before. 6.9% do monthly breast self-exams. 9.7% had a clinical breast exam before. 3.4% go for a clinical breast exam annually. 7% had a mammogram before. 3% go for a mammogram annually.

Table 6 Participants practice towards breast cancer (n=842)

Parameter	*Yes*	*No*	*Sometimes*
Done a breast self-examination before	402 47.7%	440 52.3%	0 0%
Do monthly breast self-exams	58 6.9%	582 69.1%	202 24.0%
Had a clinical breast exam before	82 9.7%	760 90.3%	0 0%
Go for a clinical breast exam annually	29 3.4%	783 93.0%	30 3.6%
Had a mammogram before	59 7.0%	783 93.0%	0 0%
Go for a mammogram annually	25 3.0%	788 93.6%	29 3.5%

As regards Table 7, it shows the barriers of breast examination among the studied participants. Thirty-six percent saw no reason to do breast self-examination, 14.8% said they fear that they find something bad, while 12% said they are afraid of breast self-examination. As for clinical breast examination, 18.9% didn't know who to consult, and 8.7% didn't want to go to a male physician. Regarding mammography, 30.8% saw no reason to do it as a screening test for breast cancer.

Table 7 Barriers of breast cancer examination among participants (n=842)

Parameter		No.	%
Barriers for breast self-examination (Bias Risk)	Fear of something bad	125	14.8
	I am afraid of the procedure	101	12.0
	I see no reason to do	305	36.2
	Other	173	20.5
	I did not know	138	16.4
Barriers for breast clinical examination (Bias Risk)	I'm afraid of taking the test	105	12.5
	I'm afraid of bad results	95	11.3
	I don't know who to consult for this test	159	18.9
	I see no reason to test	334	39.7
	Doctors are always male	73	8.7
	Other	139	16.5
Barriers for undergoing mammogram (Bias Risk)	Fear of the examination process	110	13.1
	Fear of bad results	87	10.3
	I don't know who to consult for the test	122	14.5
	I'm not the right age	135	16.0
	For financial reasons	113	13.4
	Mammograms are not available at the health facility	51	6.1
	I don't see a reason to do the scan	259	30.8
	Other	144	17.1

Figure 2 shows knowledge scores of breast cancer among studied sample. 23.9% had low knowledge score, 41.9% had moderate knowledge score, and 34.2% ha high knowledge scores. As in Figure 3, practice score of breast-cancer screening among studied sample. 90.7% of participants had bad practice, 6.4% had fair practice, and only 2.9% had good practice.

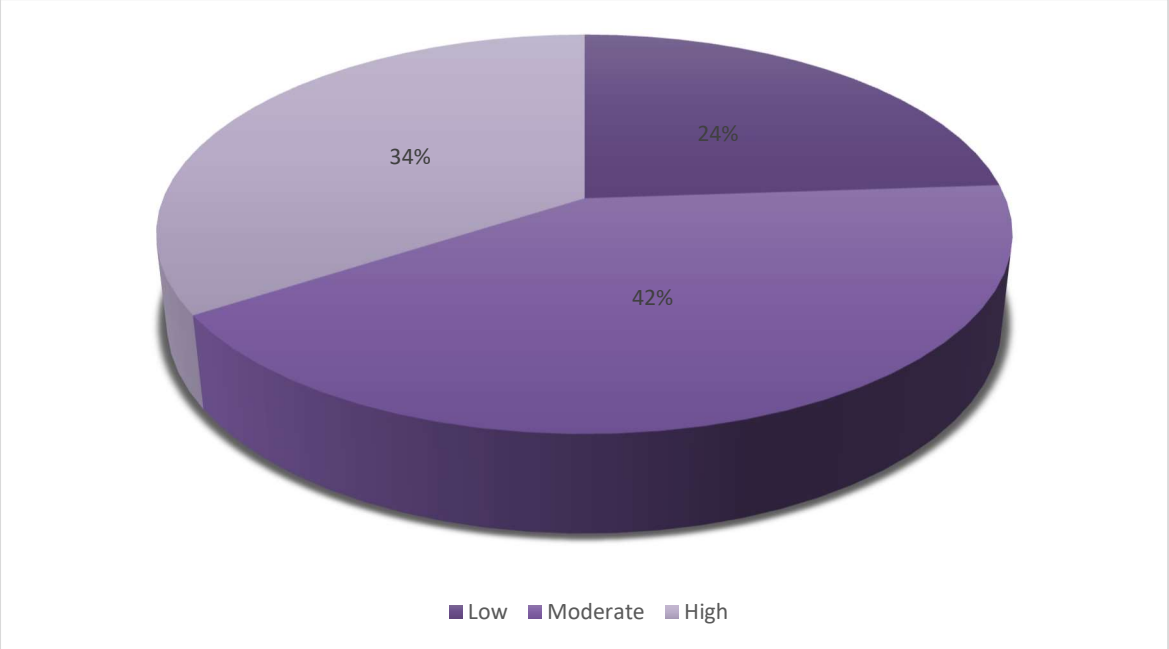

Figure 2 Knowledge score of breast cancer screenings

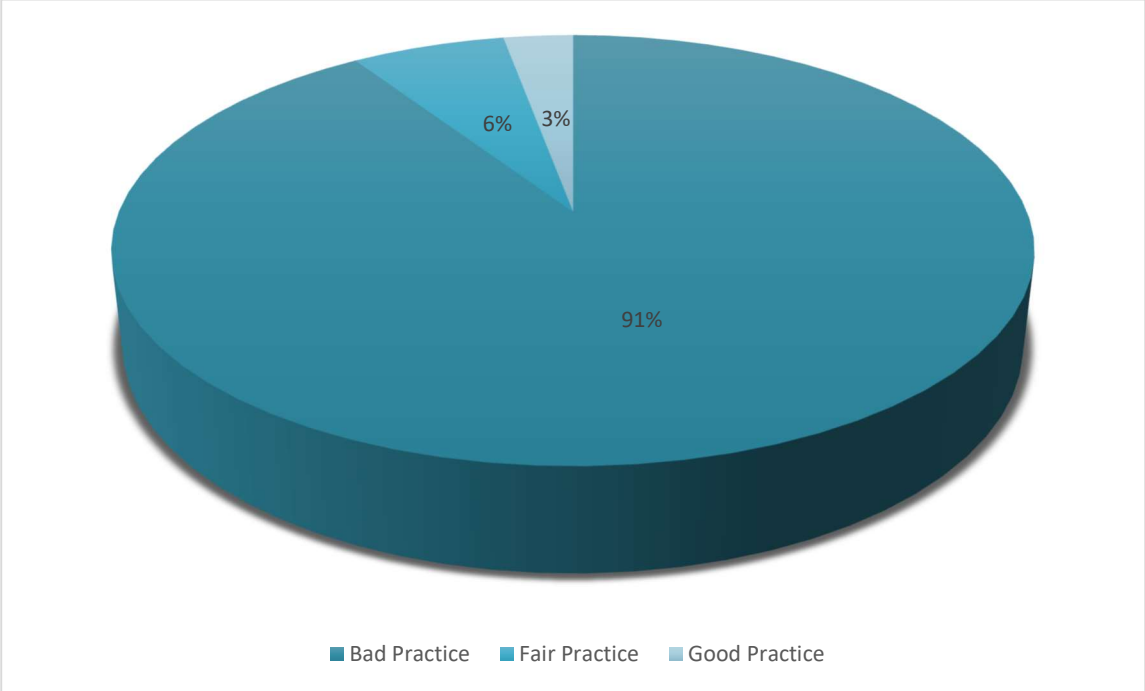

Figure 3 Practice score of breast cancer screening among participants

Knowledge scores of participants were significantly associated with age, nationality, and job of participants. However, practice scores of participants were significantly associated with age, marital status, and participants' jobs ($P< 0.05$) as in (Table 8, 9).

Table 8 Association between knowledge score with socio-demographic charters of participants (n=842)

		Knowledge score			Total (N=842)	P value
		Low	Middle	High		
Age	Less than 20	26	63	22	111	0.013
		3.1%	7.5%	2.6%	13.2%	
	20 - 30	129	220	206	555	
		15.3%	26.1%	24.5%	65.9%	
	31- 40	22	36	22	80	
		2.6%	4.3%	2.6%	9.5%	
	41- 50	19	23	29	71	
		2.3%	2.7%	3.4%	8.4%	
	51- 60	5	11	9	25	
		0.6%	1.3%	1.1%	3.0%	
Marital status	Married	61	93	90	244	0.174
		7.2%	11.0%	10.7%	29.0%	
	Single	125	245	186	556	
		14.8%	29.1%	22.1%	66.0%	
	Divorced	12	11	12	35	
		1.4%	1.3%	1.4%	4.2%	
	Widow	3	4	0	7	
		0.4%	0.5%	0.0%	0.8%	
Nationality	Saudi	189	321	277	787	0.026
		22.4%	38.1%	32.9%	93.5%	
	Non-Saudi	12	32	11	55	
		1.4%	3.8%	1.3%	6.5%	
Job	Employee	36	65	59	160	0.001
		4.3%	7.7%	7.0%	19.0%	
	Student	93	204	180	477	
		11.0%	24.2%	21.4%	56.7%	
	Housewife	67	78	41	186	
		8.0%	9.3%	4.9%	22.1%	
	Retired	5	6	8	19	
		0.6%	0.7%	1.0%	2.3%	

Table 9 Association between practice score with sociodemographic charters of participants (n=842)

		Practice score for screening			Total (N=842)	P value
		Bad practice	Fair practice	Good practice		
Age	Less than 20	105	5	1	111	0.001
		12.5%	0.6%	0.1%	13.2%	
	20 – 30	519	30	6	555	
		61.6%	3.6%	0.7%	65.9%	
	31- 40	75	4	1	80	
		8.9%	0.5%	0.1%	9.5%	
	41 -50	50	12	9	71	
		5.9%	1.4%	1.1%	8.4%	
	51- 60	15	3	7	25	
		1.8%	0.4%	0.8%	3.0%	
Marital	Married	205	23	16	244	0.001

status		24.3%	2.7%	1.9%	29.0%	
	Single	525	27	4	556	
		62.4%	3.2%	0.5%	66.0%	
	Divorced	28	4	3	35	
		3.3%	0.5%	0.4%	4.2%	
	Widow	6	0	1	7	
		0.7%	0.0%	0.1%	0.8%	
Nationality	Saudi	712	52	23	787	0.600
		84.6%	6.2%	2.7%	93.5%	
	Non-Saudi	52	2	1	55	
		6.2%	0.2%	0.1%	6.5%	
Job	Employee	133	19	8	160	0.0011
		15.8%	2.3%	1.0%	19.0%	
	Student	451	21	5	477	
		53.6%	2.5%	0.6%	56.7%	
	Housewife	172	10	4	186	
		20.4%	1.2%	0.5%	22.1%	
	Retired	8	4	7	19	
		1.0%	0.5%	0.8%	2.3%	

4. DISCUSSION

For breast cancer to be detected early, knowledge and awareness are essential. Breast cancer ranks top among female cancers in Saudi Arabia, where it accounts for 20.6% of all newly diagnosed female cancers (Mansoor, 2001). The purpose of this study was to evaluate women's awareness and screening for breast cancer, as well as to determine the causes of their non-screening. According to the current study, knowledge scores of breast cancer among studied sample were 23.9% had low knowledge score, 41.9% had moderate knowledge score, and 34.2% ha high knowledge scores. This was lower than reported in a Saudi study as majority of participants (53.7%) had an intermediate level of awareness about breast cancer risk factors, whereas only 9.2% were classified as having a good to exceptional level (Al-Mousa et al., 2020).

These findings are in line with earlier research on Jordanian nurses undertaken by Alkhasawneh, (2007), which revealed a low degree of breast cancer knowledge. Despite governmental initiatives to raise-awareness about breast-cancer, a comparable lack of understanding was identified among female university students and teachers in Jordan (Alsaraireh and Darawad, 2018; Suleiman, 2014). These results are consistent with an Iraqi study that was conducted among educated individuals, which found that nearly half of the sample had inadequate awareness of breast cancer (a score of less than 50%) (Alwan et al., 2012; Madanat and Merrill, 2002).

The Jordan Breast Cancer Program, which was established in 2007, as well as the campaigns Stay in My Life, Get Screened, and Do Not Wait for the Signs did not produce the desired effects, which were an increase in the general public's understanding and awareness of breast-cancer. It is known that BSE training increases a woman's awareness of her breasts, which may lead to a breast cancer diagnosis being made earlier (Lauby-Secretan et al., 2015; Alghamdi, 2023). According to our results, 90.7% of participants had bad practice, 6.4% had fair practice, and only 2.9% had good practice. This was higher than Saudi study reported that 42.7% of the participants in Saudi research admitted to doing BSE, while only 14.8% of them did so on a regular basis. A recent study in Al-Madinah found that 38.5% of people who visited primary healthcare facilities performed BSE (Al-Zalabani et al., 2018).

There have been reports of other numbers, including 52% in Hong Kong, 66% in KSA nursing students (Alsaif, 2004), 37.5% in Jordan (Alsaraireh and Darawad, 2018), and 76.5% in Uganda (Godfrey et al., 2016). The variations in the investigated population's characteristics and the community's cultural and religious heritage may be to blame for the disparity in rates between different researches. The most effective screening method for finding breast cancer at an early stage is mammography. Regular mammography screening has been associated with 20% to 25% lower breast cancer mortality rates.

According to research by Fancellu et al., (2019), women who regularly do mammography screenings were diagnosed early with smaller tumor sizes (14 mm) than those who did not (18 mm) (P 0.01). As a result, individuals had a threefold increased chance of having less involved surgery and a shorter hospitalization. However, several earlier researches stressed the fact that-females do not

tend to obtain mamo-grams on a regular-basis (Parsa et al., 2008). In our study, 58.2% of participants heard of mammogram. 31.8% reported that the appropriate age to start a mammogram is from the age of forty. 28.3% reported that it is an appropriate time to perform a mamm-gram if there is family-history of breast-cancer annually.

Only 17.2% of research participants had previously undergone a mammogram, according to a Saudi study (Al-Mousa et al., 2020). Despite Saudi women typically receiving free mammograms, the current paper found that 22.5% of women had previously had a mammography. This number is slightly less than what Al-Zalabani et al., (2018) recorded (27.7%), which may be explained with young age of most participants in our study. When analysis was limited to instructors over 40, rates for BSE and mammograms were 39% and 29.1%, respectively. BSE and mammography results were reported by 23.1% and 14.8% of the women in research conducted in the Riyadh region that used primary health centers, respectively (Ravichandran et al., 2011).

Another Saudi study done in Dammam found the same low performance rate for mammograms (Latif, 2014). According to a study by Al-Wassia et al., (2017), 40% of Saudi women have ever undergone a mammogram. According to Abdallah et al., (2015), 13% of Saudi females have had a mammogram. 92% of Saudi women 50 years of age and older, according to El-Bcheraoui et al., (2015), have never had a mammogram. The mammography screening rate in Jordan was previously reported to be exceedingly low (not even 10%) (Othman et al., 2015). Similarly low rates were observed in other Islamic countries, where women made up 21.5% of the Iranian population, 22.5% of the Qatari population, and 39.4% of the Turkish population, respectively.

As for barriers for screening, 12.5% afraid of taking the test, 11.3% afraid of bad results, and 18.9% don't know who to consult for this test. Barriers for undergoing mammogram were reported as 13.1% ear of the examination process, 10.3% fear of bad results, 14.5% don't know who to consult for the test, 16% not the right age, 13.4% for financial reasons, 6.1% for lack of availability at the health facility, and 30.8% don't see a reason to do the scan. This was consistent with a recent study that found the top cited barriers to breast-cancer screening to be fear of finding something abnormal (50.9%), being busy (49.4%), not understanding how to arrange for it (40.8%), and uncertainty about how it will be carried out (37.3%).

The main hurdles in a study done in Al-Madinah among those who attended basic healthcare centers were 12 false ideas about mammography being a painful treatment and the exposure of women to more unnecessary radiation. But in that study, ineffective communication with mammography staff members and the idea that mammography is embarrassing were also significant hurdles. Due to variations in the target population's characteristics, it is expected that the outcomes of the two researches will differ (Al-Zalabani et al., 2018).

Knowledge scores of participants were significantly associated with age, nationality, and job of participants. However, practice scores of participants were significantly associated with age, marital status, and participants' jobs. This was on agreement with previous literature as results of previous Saudi study demonstrated a strong positive link between the level of education and the three study-variables, knowledge about breast-cancer risk-factors, signs and symptoms, and awareness of breast cancer early detection and curability (Akpinar et al., 2011; Bener et al., 2009; Haji-Mahmoodi et al., 2002).

Additionally, 77.6% of participants who had or currently had a job were more knowledgeable about breast-cancer, early detection techniques, and curability than participants who had never held a job (Al-Mousa et al., 2020). This finding is corroborated by previous investigations in Kuwait (Saeed et al., 2014), Qatar (Bener et al., 2009), Nepal (Sathian et al., 2014), and India (Fotedar et al., 2013). The results of a study conducted in Ethiopia likewise demonstrated a strong correlation between participants' breast cancer knowledge and BSE usage. The commonest reasons indicated why the females were practicing-BSE were: For early discovery and seeking-treatment and fear of developing (Shallo and Boru, 2019).

5. CONCLUSION

In conclusion, Saudi women showed poor knowledge level regarding breast cancer screening. However, good practice was noticed towards screening. Particularly at the community level, breast cancer awareness campaigns on the signs, symptoms, screening, and prevention should be launched. The promotion of healthy behaviors among young women, particularly with regard to personal hygiene, breast self-examination, and other screening programs to ensure early identification and the initiation of treatment, may also be significantly aided by health education.

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Author Contributions

The authors confirm contribution to the paper as follows: Study conception and design: Abdullah Qureshey. Data collection: Abdullah Qureshey, Rayan Alshuaylan, Mohammed Faleh, Zahra Al-Abbad. Draft manuscript preparation: Abdullah Qureshey, Ghader Jamjoum, Rayan Alshuaylan, Mohammed Faleh, Zahra Al-Abbad, Essam Wael Zarei, Asseel Alaidarous, Azzam Aljuaid, Khames T Alzahrani. All authors reviewed the results and approved the final version of the manuscript.

Ethical approval

Ethical approval was obtained from the research ethics committee of king Abdul-Aziz University, Faculty of medicine. Application number: (169-23). An informed consent was obtained from each participant after explaining the study in full and clarifying that participation is voluntary. Data collected were securely saved and used for the research purposes only.

Informed consent

Written informed consent was obtained from all individual participants included in the study.

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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.

REFERENCES AND NOTES

1. Abdallah AS, El-Gharabawy RM, Al-Suhaibany HO. Knowledge, Attitude and Practice about Breast Cancer among Women in Saudi Arabia. Int Arch Med 2015; 1–13.
2. Akpinar YY, Baykan Z, Naçar M, Gün I, Çetinkaya F. Knowledge, attitude about breast cancer and practice of breast cancer screening among female health care professionals: A study from Turkey. Asian Pac J Cancer Prev 2011; 12(11):3063–8.
3. Al-Ghadeer B, Al-Ghadeer A, Aldoughan S. Breast cancer knowledge and barriers to screening among women in Al-Ahsa, Saudi Arabia. Int J Med Dev Ctries 2021; 106–12.
4. Alghamdi W. Socio-demographic predictors of knowledge, attitude and practice of antenatal exercise among pregnant women. Med Sci 2023; 27:e92ms2886
5. Alkhasawneh IM. Knowledge and practice of breast cancer screening among Jordanian nurses. Oncol Nurs Forum 2007; 34(6):1211-7. doi: 10.1188/07.ONF.1211-1217
6. Al-Mousa DS, Alakhras M, Hossain SZ, Al-Sadi AG, Al-Hasan M, Al-Hayek Y, Brennan PC. Knowledge, attitude and practice around breast cancer and mammography screening among Jordanian women. Breast Cancer (Dove Med Press) 2020; 12:231–42.
7. Alqahtani T, Alqahtani AM, Alshahrani SM, Orayj K, Almanasef M, Alamri AH, Easwaran V, Khan NA. Assessment of knowledge and practice of mammography and breast self-examination among the general female population in Asir region of KSA. Eur Rev Med Pharmacol Sci 2021; 25(23):7231–7.
8. Alsaif AA. Breast self-examination among Saudi female nursing students in Saudi Arabia. Saudi Med J 2004; 25(11): 1574–8.
9. Alsaraireh A, Darawad MW. Breast cancer awareness, attitude and practices among female university students: A descriptive study from Jordan. Health Care Women Int 201 8; 39(5):571–83.
10. Alwan NAS, Al-Attar WM, Eliessa RA, Madfaie ZA, Tawfeeq FN. Knowledge, attitude and practice regarding breast cancer and breast self-examination among a sample of the educated population in Iraq. East Mediterr Health J 2012; 18(4):337–45.
11. Al-Wassia RK, Farsi NJ, Merdad LA, Haj S. Patterns, knowledge and barriers of mammography use among women in Saudi Arabia. Saudi Med J 2017; 38(9):913–21.
12. Al-Zalabani AH, Alharbi KD, Fallatah NI, Alqabshawi RI, Al-Zalabani AA, Alghamdi SM. Breast Cancer Knowledge and Screening Practice and Barriers Among Women in Madinah, Saudi Arabia. J Cancer Educ 2018; 33(1):201–7.
13. Anwar SL, Tampubolon G, Van-Hemelrijck M, Hutajulu SH, Watkins J, Wulaningsih W; PILAR Research Network. Determinants of cancer screening awareness and participation among Indonesian women. BMC Cancer 2018; 18(1):208. doi: 10.1186/s12885-018-4125-z

14. Basri LA, Milyani A, Bahader W, Alghamdi AM, Haider MA, Moemen AH. A survey to determine the knowledge, preference and perception towards labor analgesia among women in the ministry of health hospitals, Jeddah, Saudi Arabia. Med Sci 2023; 2738:1–10.
15. Bener A, El-Ayoubi HR, Moore MA, Basha B, Joseph S, Chouchane L. Do we need to maximise the breast cancer screening awareness? Experience with an endogamous society with high fertility. Asian Pac J Cancer Prev 2009; 10 (4):599–604.
16. El-Bcheraoui C, Basulaiman M, Wilson S, Daoud F, Tuffaha M, Al-Mazroa MA, Memish ZA, Al-Saeedi M, Mokdad AH. Breast cancer screening in Saudi Arabia: Free but almost no takers. PLoS One 2015; 10(3):e0119051. doi: 10.1371/journal.pone.0119051
17. Fancellu A, Sanna V, Sedda ML, Delrio D, Cottu P, Spanu A, Giuliani G, Conti M, Piras R, Crivelli P, Porcu A. Benefits of Organized Mammographic Screening Programs in Women Aged 50 to 69 years: A Surgical Perspective. Clin Breast Cancer 2019; 19(5):e637–42. doi: 10.1016/j.clbc.2019.04.013
18. Fotedar V, Seam RK, Gupta MK, Gupta M, Vats S, Verma S. Knowledge of Risk Factors & Early Detection Methods and Practices towards Breast Cancer among Nurses in Indira Gandhi Medical College, Shimla, Himachal Pradesh, India. Asian Pac J Cancer Prev 2013; 14(1):117–20. doi: 10.7314/apjcp.2013.14.1.117
19. Godfrey K, Agatha T, Nankumbi J. Breast cancer knowledge and breast self-examination practices among female university students in Kampala, Uganda: A descriptive study. Oman Med J 2016; 31(2):129–34. doi: 10.5001/omj.2016.25
20. Gouse HSM, Wahid SMA, Al-Gaedy R, Al-Ahdal DA, Katib GA, Melebari R, Sultan IE. Perception, attitude and experience of women living in Jeddah with or without Breast lump towards BSE & mammography: Pre- Post study. Med Sci 2022; 26(120):1.
21. Haji-Mahmoodi M, Montazeri A, Jarvandi S, Ebrahimi M, Haghighat S, Harirchi I. Breast self-examination: Knowledge, attitudes, and practices among female health care workers in Tehran, Iran. Breast J 2002; 8(4):222–5. doi: 10.1046/j.1524-4741.2002.08406.x
22. Heena H, Durrani S, Riaz M, Alfayyad I, Tabasim R, Parvez G, Abu-Shaheen A. Knowledge, attitudes, and practices related to breast cancer screening among female health care professionals: A cross sectional study. BMC Womens Health 2019; 19(1):122.
23. Ismail NF, Ravi D. Knowledge and Awareness of Breast Cancer and Mammography Among Women in Klang, Selangor. Malaysian J Appl Sci 2021; 6(1):15–20.
24. Latif R. Knowledge and attitude of Saudi female students towards breast cancer: A cross-sectional study. J Taibah Univ Med Sci 2014; 9(4):328–34.
25. Lauby-Secretan B, Scoccianti C, Loomis D, Benbrahim-Tallaa L, Bouvard V, Bianchini F, Straif K; International Agency for Research on Cancer Handbook Working Group. Breast-cancer screening-viewpoint of the IARC Working Group. N Engl J Med 2015; 372(24):2353-8. doi: 10.1056/NEJMsr1504363
26. Madanat H, Merrill RM. Breast cancer risk-factor and screening awareness among women nurses and teachers in Amman, Jordan. Cancer Nurs 2002; 25(4):276–82. doi: 10.1097/00002820-200208000-00003
27. Mansoor I. Profile of female breast lesions in Saudi Arabia. J Pak Med Assoc 2001; 51(7):243–7.
28. Manzour AF, Gamal-Eldin DA. Awareness about breast cancer and mammogram among women attending outpatient clinics, Ain Shams University Hospitals, Egypt. J Egypt Public Health Assoc 2019; 94(1):26. doi: 10.1186/s42506-019-0026-5
29. Nour B El, Al-Talib A, Aswad O, Aljumah A, Alshammari F, Jamlan F. Breast cancer in Saudi Arabia, clinical aspects, risk factors, awareness and preventive practices. Med Sci 2023; 2856:1–9.
30. Othman A, Ahram M, Al-Tarawneh MR, Shahrouri M. Knowledge, Attitudes and Practices of Breast Cancer Screening Among Women in Jordan. Health Care Women Int 2015; 36(5):578–92. doi: 10.1080/07399332.2014.926900
31. Parsa P, Kandiah M, Zulkefli NAM, Rahman HA. Knowledge and behavior regarding breast cancer screening among female teachers in Selangor, Malaysia. Asian Pac J Cancer Prev 2008; 9(2):221–8.
32. Ravichandran K, Al-Hamdan N, Mohamed G. Knowledge, attitude, and behavior among Saudis toward cancer preventive practice. J Family Community Med 2011; 18(3):135–42. doi: 10.4103/2230-8229.90013
33. Saeed RS, Bakir YY, Ali LM. Are women in Kuwait aware of breast cancer and its diagnostic procedures? Asian Pac J Cancer Prev 2014; 15(15):6307–13. doi: 10.7314/apjcp.2014.15.15.6307
34. Sathian B, Nagaraja SB, Banerjee I, Mittal A, De A, Roy B, Rajesh E, Senthilkumaran S, Hussain SA, Menezes RG. Awareness of breast cancer warning signs and screening methods among female residents of pokhara valley, Nepal. Asian Pac J Cancer Prev 2014; 15(11):4723–6. doi: 10.7314/apjcp.2014.15.11.4723
35. Shallo SA, Boru JD. Breast self-examination practice and associated factors among female healthcare workers in West Shoa Zone, Western Ethiopia 2019: A cross-sectional study.

BMC Res Notes 2019; 12(1):637. doi: 10.1186/s13104-019-4676-3
36. Solikhah S, Lianawati L, Matahari R, Rejeki DSS. Determinants of Breast Cancer Screening Practice among Women in Indonesia: A Nationwide Study. Asian Pac J Cancer Prev 2021; 22(5):1435–41. doi: 10.31557/APJCP.2021.22.5.1435
37. Suleiman A. Awareness and attitudes regarding breast cancer and breast self-examination among female Jordanian students. J Basic Clin Pharm 2014; 5(3):74-8. doi: 10.4103/0976-0105.139730
38. Sun YS, Zhao Z, Yang ZN, Xu F, Lu HJ, Zhu ZY, Shi W, Jiang J, Yao PP, Zhu HP. Risk factors and preventions of breast cancer. Int J Biol Sci 2017; 13(11):1387–97. doi: 10.7150/ijbs.21635