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Awareness, Practice and Barriers of Cervical Cancer Screening Among Women Attending Primary Health Care Centers in Dammam, Khobar, and Qatif, KSA.

Zahra AlAli[1], Reem Melaibary[2], Talal AlSharari[3], Yaquot AlMutairi[4], Maha S. Eltwansy[5]

Family Medicine Academy, E1 cluster, Kingdom of Saudi Arabia[1,2,3,4,5]
Assisstant Professor of Community Medicine and Public Health, Zagazig University, Egypt[5]

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ABSTRACT

Cervical cancer is one of the most common malignancies to strike women globally. The awareness and performance of cervical cancer screening among women are essential in the early detection and proper management of cervical cancer cases. This study aimed to assess awareness, practice and barriers of cervical cancer screening among women attending primary health care centers. This study is an analytic cross-sectional stud conducted on 385 women at primary health care centers in Dammam, Khobar, and Qatif during the period December 2023 until March-2024. A self-administered validated Arabic questionnaire was used to collect data about awareness, practice and barriers of cervical cancer screening. Among 385 women, almost two-thirds (64.7%) have heard about cervical cancer screening and most of them (70.6%) knew that it is important to perform cervical cancer screening. Most of respondents (82.3%) had poor overall awareness level. Only 23.1% of the participants had screened for cervical cancer and almost 10% have been screened more than once. The main reported barriers for performing cervical cancer screening were having inadequate information about it, absence of symptoms, lack of advice from treating physicians, lack of knowledge about which center performs the test and feeling afraid to do test. Overall awareness level, marital status, and the barrier feeling afraid of screening were significant predictors of practice ($p \leq 0.05$). As a conclusion the overall awareness level about cervical cancer screening was poor, although a significant proportion of participants have heard about cervical cancer screening. The uptake of the cervical cancer screening was low.

1. INTRODUCTION

Cervical cancer is an abnormal formation of cells in the cervix. Human papillomavirus is a sexually transmitted virus. It is the essential cause of cervical cancer globally and responsible for almost all cases of cervical cancer. More frequent cases occur at the age of 30. All women are at risk to develop cervical cancer, but several risk factors may increase the risk. HIV increases the risk 5 times. Moreover, multiple sex partners,

sexual intercourse at an early age, sexual intercourse with an uncircumcised man, 5 years or more use of the oral contraceptive pill, parity (three or more children), smoking, and inadequate personal hygiene are some risk factors that increase the risk of cervical cancer [1- 4].

Cervical cancer is one of the most frequent cancers that affected females. Worldwide, it's ranked as the fourth most cancer prevalent among women. Although cervical cancer is highly curable when diagnosed early, cervical cancer leads to millions of deaths at the rate of one death every two minutes, and 9 out of 10 women die because of cervical cancer in poor countries [5], [6].

In the Kingdom of Saudi Arabia (KSA), cervical cancer is classified as the 8th leading cause of female cancer, especially in women aged 15-44 years. The estimate of the annual number of new cases in Saudi was 358 diagnosed as cervical cancer. The world health organization reported that 6.5 million women older than 15 years of age in Saudi Arabia are at risk for cervical cancer. The mortality rate for Saudi Arabia was 179 annually [7].

Guideline for cervical cancer screening in the United States preventive task force recommends screening women from age 21-65 years every 3 years [8]. The world health organization recommends secondary prevention by screening women aged 30 years and older for cervical cancer. Screening is done by either pap smear or human papilloma virus testing. A Pap smear is a test usually done by a physician. The instrument used in this procedure is called a speculum This instrument will aid the doctor for a better view of the cervix. The sample will be collected by a special brush that will obtain cells from the cervix; these cells are sent to the laboratory for cytology assessment for abnormal cells [9]. There is also another test called human papillomavirus testing. It is like a pap smear test but here the sample is sent for evaluation of the presence of human papilloma virus [10].

There is a study conducted in four gulf countries in 2019 showed that the screening rate for cervical cancer was 7.6% in Saudi Arabia, 10.6% in Oman, 17.7% in Kuwait, and 28% in Emirates [11].

Given that cervical cancer ranks eighth among female cancer causes in Saudi Arabia, we felt it was important to study this issue. Several studies were conducted to evaluate the knowledge, attitude, and practice toward cervical cancer screening internationally and nationally but up to the knowledge of researchers there was no study carried out in the Eastern Province of KSA [12-19]. This study aimed to assess awareness, practice and barriers of cervical cancer screening among women attending primary health care centers.

2. Methods

Study design, setting and time:
Analytic cross-sectional study was carried out at primary health care centers at the ministry of health, under Eastern Province (EP) cluster in three different sectors, Dammam, Khobar, and Qatif in Saudi Arabia during the period December 2023 until March 2024.

Study population:
All Adult females attending primary health care centers living in Dammam, Khobar, and Qatif, Eastern Province of Saudi Arabia.

Sample size and technique:
The sample size was calculated using Rao soft sample size calculator. The total population who lived in

Eastern Province in mid of 2017 was 5 million [20]. Taking into consideration that the margin of error is 5%, confidence level is 95%, response distribution 50%, sample size was calculated to be 385. Adding 20% non-response, the sample size was 462.

Multi-stage sampling technique method was performed as follow:

1- First stage: Through dividing PHCs according to the geographic distribution into 3 cluster samples: Dammam, Khobar and Qatif.

2- Second stage: The sample was collected from 7 PHCs according to proportional distribution (3 from Dammam: 1 from AlKhobar: 3 from Qatif). The PHCs were selected by simple random technique method.

Selection of participants is proportional to the number of primary care centers in each cluster.

A total number of primary health centers is (72) PHCs in all three-cluster divided as follow:

- Dammam: 30 primary health care centers (42%), SS = 194 women.
- Khobar: 11 primary health care centers (15%), SS = 69 women.
- Qatif: 31 primary health care centers (43%), SS = 199 women.

3- Third stage: Convenient sampling technique method was be used to select the women from PHCs until reaching sample size for each cluster.

Data collection tool

The data was collected through a self-administered questionnaire in Arabic language, adopted from 3 published studies in Turkey, Al Madinah, and Jeddah [14], [16], [21] and modified by the researchers. The authors were contacted for permission.

Construct validity was done by an extensive literature review. The content validity was assessed by eight expert specialized consultants

Pilot study:

Pilot study was performed on 10 % of the sample (30 women) who was excluded from the study. It tested the clarity and understanding of the questionnaire, and the time taken to complete the questionnaire. Modifications was carried out accordingly. Reliability was tested by calculating Cronbach alpha for awareness section it was equals to 0.799.

The questionnaire was organized into the following four sections:

section I: Socio-demographic information (age, educational level, employment status, income level, marital status and resident area)

section II: Awareness about cervical cancer screening (risk factors, symptoms, pap smear test as a screening tool)

section III: The practice of cervical cancer screening (previous history and frequency of pap smear test)

section IV: Barriers to cervical cancer screening (some reasons may prevent women from taking the test)

Data collection method

The researchers collected the data from the women at primary health care centers during working hours from 8 Am to 4 PM. The participants were asked to complete the questionnaire through a prepared sheet on google using I pads of the researcher.

Data processing and analysis:

Data was coded and managed using Statistical Package for the Social Sciences (SPSS) version 23.

Scoring and coding was as following:

Awareness was measured by questions answered by yes and no/ I don't know. Correct answer was coded 1, while incorrect answer was coded 0. Total awareness score was calculated by adding all the questions. It was out of 11. The cutoff point was indicated at 60%. Less than 60% was considered poor awareness.

The practice and barriers were assessed by questions answered by yes and no. It was coded as yes=1 and

no=0.
Categorical data were presented in frequency and percentage. Chi square and fisher exact test were used when appropriate to measure the association. Logistic regression was used to detect the predictors. A p-value less than or equal to 0.05 was considered significant.

Ethical consideration:
Approval for the study was taken from the IRB committee of Dammam, Khobar and Qatif sectors in the E1 cluster. Permission to use the questionnaire was requested from the authors. The anonymity of the participants and confidentiality of the information was preserved. All participants were informed about the purpose of the study. The participants voluntarily agreed to answer the questionnaire. Written informed consent was taken before filling the questionnaire. Filled questionnaires was discarded at the end of the study

Budget
It was self-funded.

Conflict of interest
There was no conflict of interest.

3. Results

Table 1: Characteristics of Women Attending Primary Health Care Centers in Dammam, Khobar, and Qatif

Characteristic	**Frequency (n=385)**	**Percentage (%)**
Age in years:		
18-24	71	18.4
25-34	127	33.0
35-44	125	32.5
45-54	25	6.5
55-64	21	5.5
More than 64	16	4.2
Educational level:		
Illiterate/ Primary school	13	3.4
Secondary school	24	6.2
High school	127	33
University not medical field	162	42.1
University medical field	59	15.3
Occupation:		
Not working	170	44.2
Work in non-medical field	131	34.0
Work in medical field	58	15.1
Retired	26	6.8
Monthly income:		
Less than 5000 SR	170	44.2
5000-10000 SR	153	39.7
More than 10000 SR	62	16.1

Marital status:		
Not married	73	19.0
Married	268	69.6
Divorced / widow	44	11.4
Living place:		
Dammam	171	44.4
Khobar	102	26.5
Qatif	105	27.3
Others	7	1.8
Family history of cervical cancer:		
Yes		
No/ I don't know	15	3.9
	370	96.1
Diagnosed with cervical cancer:		
Yes	4	1.0
No/ I don't know	381	99.0

This table demonstrates that 385 respondents had completed the questionnaire. Most of the participants were married and aged between 25-44 years (69.6% and 65.5% respectively). More than half of the sample had university education (57.4%). Almost 44 % of the participants were living in Dammam, not working and had monthly income less than 5000 SR. Only 3.9 % and 1 % of respondents had family history and was diagnosed with cervical cancer respectively.

Table 2: Awareness of Cervical Cancer Screening Among Women Attending Primary Health Care Centers in Dammam, Khobar, and Qatif, KSA.

	Frequency (n=385)	**Percentage (%)**
Hear about cervical cancer screening		
Yes	249	64.7
No	136	35.3
Sources of information		
Family and friends	49	16.4
Physician	145	48.7
Social media	84	28.2
others	20	6.7
It is important to perform cervical cancer screening		
Yes		
No	272	70.6
I don't know	20	5.2
	93	24.2
Cervical cancer screening is accurate to discover cervical cancer in early stage?		
Yes	200	51.9
No	37	9.6
I don't know	148	38.4
Cervical cancer screening is not painful		
Yes	98	25.5
No	66	17.1

I don't know	221	57.4
Cervical cancer screening causes side effects if performed correctly		
Yes	54	14.0
No	114	29.6
I don't know	217	56.4
Suitable period/age to start cervical cancer screening		
3 years after marriage		
Age of 30	50	13.0
Age of 40	65	16.9
I don't know	78	20.3
	192	49.9
When to re-do cervical cancer screening		
Every 6 months	34	8.8
Every year	113	29.4
Every 3 years	51	13.2
I don't know	187	48.6
Stop cervical cancer screening at age of		
55 years	19	4.9
65 years	44	11.4
75 years	28	7.3
I don't know	294	76.4
Is there a difference between pap smear and vaginal swab		
Yes		
No	185	48.1
I don't know	18	4.7
	182	47.3
Aware about cervical cancer risk factors		
Yes	124	32.2
No	261	67.8
Aware about cervical cancer symptoms		
Yes	112	29.1
No	273	70.9

This table shows that most of the respondent women heard about cervical cancer screening (64.7%) and knew that it is important to perform cervical cancer screening (70.6%). The source of information was physician as reported by almost 50% of the sample. Around 52% of participants knew that cervical cancer screening is accurate to discover cervical cancer in early stage. Moreover, 48.1% of them knew that there is a difference between pap smear and vaginal swab. About 17% and 14% respectively thought that cervical cancer screening is painful and causes side effects if performed correctly. Low percentage of the sample correctly answered the suitable period to start, re-do and stop cervical cancer screening (13%, 13.2% and 11.4% respectively). Less than third of sample was aware about cervical cancer risk factors and symptoms (32.2% and 29.1% respectively).

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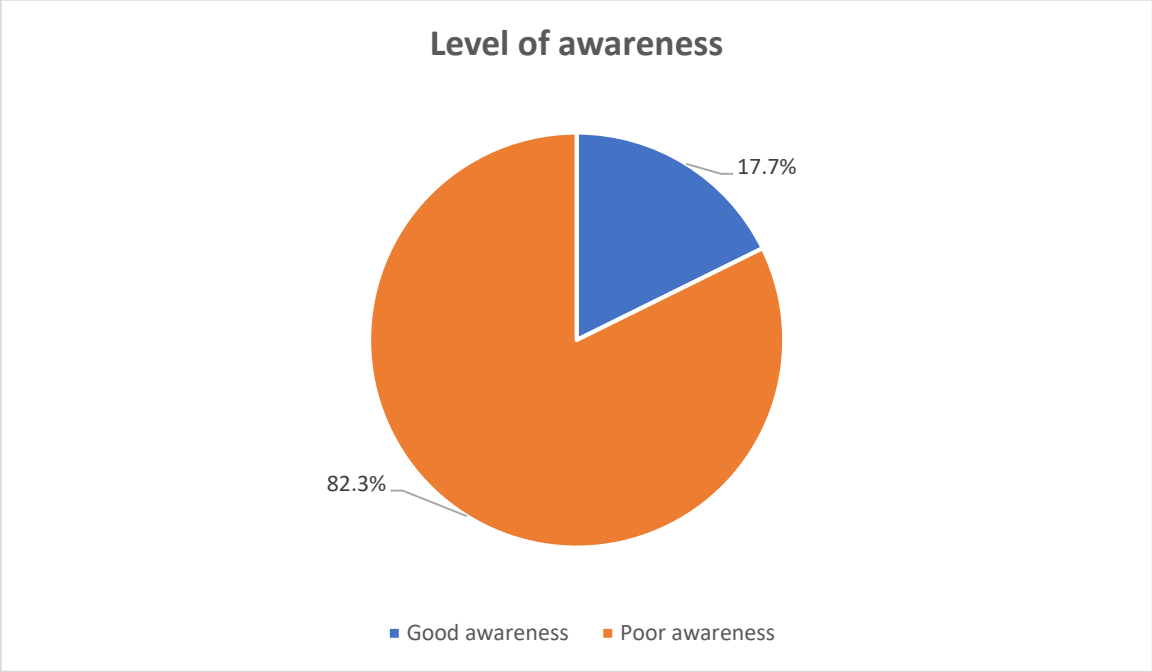

Fig 1: Level of Awareness of Cervical Cancer Screening Among Women Attending Primary Health Care Centers. This figure displays that most of the participants had poor level of awareness (82.3%).

Table 3: Practice of Cervical Cancer Screening Among Women Attending Primary Health Care Centers in Dammam, Khobar, and Qatif, KSA.

	Frequency (n=385)	**Percentage (%)**
Have you screened for cervical cancer		
Yes	89	23.1
No	296	76.9
How many times did you screened for cervical cancer		
0		
1	296	76.9
2	52	13.5
3 and more	26	6.8
	11	2.9
Where did you screened for cervical cancer		
PHCs		
Obstetric and gyn. clinics	17	15.7
Governmental hospitals	51	47.2
Private hospitals	24	22.2
	37	34.3
You will perform cervical cancer screening if it is available in Sehaty application		
Yes		
No	256	66.5
I don't know	51	13.2
	78	20.3

This table displays that 23.1% of the participants had screened for cervical cancer and 15.7% of them

performed it in PHCs. Almost 10% had screened more than once. Most of the sample (66.5%) reported that they will perform cervical cancer screening if it is available in Sehaty application.

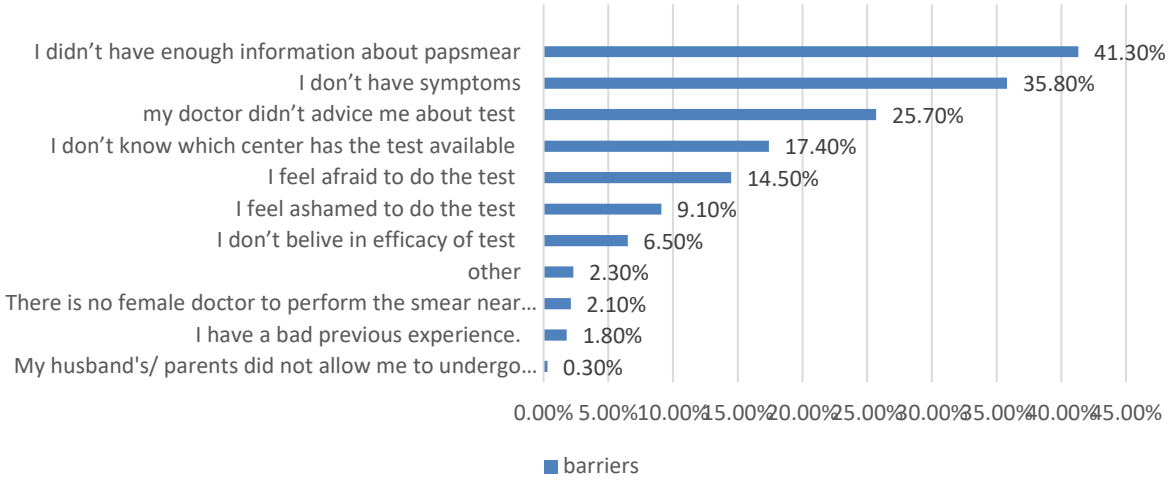

Fig 2: Barriers of Cervical Cancer Screening Among Women Attending Primary Health Care Centers in Dammam, Khobar, and Qatif, KSA. In this figure the most common barrier found among participant was inadequate information about cervical cancer screening (41.3%), followed by having no symptoms (35.8%), then lack of medical guidance for importance of doing test by healthcare worker (25.7%). Lack of knowledge about which center performs the test and feeling afraid to do the test were reported also by 17.4% and 14.5% respectively.

Table 4: Association between Practice and Characteristics of Women Attending Primary Health Care Centers in Dammam, Khobar, and Qatif

Characteristic	**No practice F (%)**	**Practice F (%)**	**P value**
Age in years:			
18-24	58 (81.7)	13 (18.3)	0.051
25-34	107 (84.3)	20 (15.7)	
35-44	86 (68.8)	39 (31.2)	
45-54	17 (68.0)	8 (32.0)	
55-64	15 (71.4)	6 (28.6)	
More than 64	13 (81.3)	3 (18.8)	
Educational level:			
Illiterate/ Primary school	11 (84.6)	2 (15.4)	0.349
Secondary school	21 (87.5)	3 (12.5)	
High school	100 (78.7)	27 (21.3)	
University not medical field	117 (72.2)	45 (27.8)	
University medical field	47 (79.7)	12 (20.3)	
Occupation:			
Not working	134 (78.8)	36 (21.2)	0.114
Work in non-medical field	101 (77.1)	30 (22.9)	
Work in medical field	46 (79.3)	12 (20.7)	
Retired	15 (57.7)	11 (42.3)	

Monthly income: Less than 5000 SR 5000-10000 SR More than 10000 SR	 138 (81.2) 115 (75.2) 43 (69.4)	 32 (18.8) 38 (24.8) 19 (30.6)	 0.136
Marital status: Not married Married Divorced / widow	 73 (100.0) 190 (70.9) 33 (75.0)	 0 78 (29.1) 11 (25.0)	 0.000*
Living place: Dammam Khobar Qatif Others	 129 (75.4) 81 (79.4) 81 (77.1) 5 (71.4)	 42 (24.6) 21 (20.6) 24 (22.9) 2 (28.6)	 0.876
Family history of cervical cancer: Yes No/ I don't know	 8 (53.3) 288 (77.8)	 7 (46.7) 82 (22.2)	 0.039*
Diagnosed with cervical cancer: Yes No/ I don't know	 1 (25.0) 295 (77.4)	 3 (75.0) 86 (22.6)	 0.04**

*Statistically significant difference ($p \leq 0.05$)

**Fisher exact test

This table shows that there was statistically significant difference between practice and marital status, family history and diagnosed with cervical cancer ($p \leq 0.05$).

Table 5: Association between Practice and Awareness and Frequent Barriers Reported by Women Attending Primary Health Care Centers in Dammam, Khobar, and Qatif

Characteristic	**Not screened F (%)**	**screened F (%)**	**P value**
Awareness Good Poor	 39 (57.4) 257 (81.1)	 29 (42.6) 60 (18.9)	 0.000*
I have insufficient information Yes No	 134 (84.3) 162 (71.7)	 25 (15.7) 64 (28.3)	 0.004*
I have no symptoms Yes No	 108 (78.3) 188 (76.1)	 30 (21.7) 59 (23.9)	 0.632
No doctor has ever advised me about the importance of test. Yes No	 74 (74.7) 222 (77.6)	 25 (25.3) 64 (22.4)	 0.559

I do not know of any health center that provides testing. Yes No	 44 (65.7) 252 (79.2)	 23 (34.3) 66 (20.8)	 0.017*
I feel afraid to get tested. Yes No	 45 (80.4) 251 (76.3)	 11 (19.6) 78 (23.7)	 0.505

This table demonstrates that there was statistically significant difference between practice and level of awareness. Moreover, there was statistically significant difference between the reported barriers had no enough information and feeling afraid of screening and with practice ($p \leq 0.05$).

Table 6: Logistic regression of Practice and significantly associated factors

	β	SE	Walid	P	OR (95% CI)
Marital status	1.379	0.358	14.872	0.000*	3.97(1.97 – 8.01)
Family History	1.0	0.599	2.792	0.095	2.72(0.84 – 8.79)
Diagnosed by cervical cancer	2.155	1.194	3.258	0.071	8.63(0.83 – 89.5)
Awareness	1.002	0.312	10.333	0.001*	2.73(1.48 – 5.02)
Having insufficient information	0.550	0.285	3.731	0.053	0.58 (0.33 – 1.01)
I feel afraid to get tested.	0.621	0.314	3.912	0.048*	1.86(1.01 – 3.44)

This table shows that marital status, awareness and the barrier feeling afraid of screening were significant predictors of practice ($p \leq 0.05$). Married women were more likely to be screened for cervical cancer than divorced/ widowed and not married (OR= 3.97, CI: 1.97 – 8.01). Women with good awareness were more likely to be screened than those with poor awareness (OR=2.73, CI: 1.48 – 5.02). Women not feeling afraid of screening were more likely to practice screening (OR=1.86, CI: 1.01-3.44).

4. Discussion

The awareness and performance of cervical cancer screening among general population women are essential in the early detection and proper management of cervical cancer cases [22], [23]. Thus, this study was performed primarily to assess the awareness and performance as well as to define barriers of cervical cancer screening among women attending primary health care centers at three main Eastern Saudi cities; Dammam, Khobar, and Qatif.

In the current study, almost two-thirds of the surveyed women heard about cervical cancer screening. This is

comparable to [14] who stated that 68% of participants had heard about pap smear test. In another nationwide online Saudi study conducted by [15] most of the participants (84%) have heard of cervical cancer screening. On the other hand, the finding of this study is higher than [16], [17] who found that 51.9% and 52.5% of sample respectively had heard about pap smear test.

Additionally, [18], [19] reported that only 48.7 and 43.5% of respondents respectively heard about pap smear test.

A significant proportion of respondents in this study knew that it is important to perform cervical screening. Similarly, [17] declared that 82.2% of sample thought that screening of cervical cancer is crucial.

In this study almost half of sample could recognize that cervical cancer screening is accurate to discover cervical cancer in early stage. This was inconsistent with [16] who identified that more than half (55.4%) of participants believed that pap smear test provides incorrect results.

Defective knowledge regarding certain items; particularly timing and recommended frequency for screening was discovered in the present study. Minority of sample knew correctly the suitable period to start cervical cancer screening, re-perform it, and stop it. This is in agreement with [16] who reported that only 15 % of sample indicated that the pap smear test should be done every 3 years. Whereas, [18] stated that 33.1% of participants did not know the proper age for undergoing Pap smear screening.

As regards to awareness of cervical cancer risk factors and symptoms, this study shows that less than third of sample were aware about them. In a review published by [12] about 33% of women had adequate knowledge of risk factors and signs and symptoms of cervical cancer. Moreover, around two thirds of women in [19] study didn’t know risk factors of cervical cancer.

Higher proportion of the participants in this study had poor overall awareness level regarding cervical cancer screening, which was comparable to [12] who found that knowledge of screening through PAP Smear was 20.31%. This low awareness may be attributed to the deficient knowledge of many items regarding timing of screening and cervical cancer risk factors and symptoms.

These differences in awareness and knowledge about cervical cancer and its screening observed in mentioned studies could be partially attributed to cultural background as well as variations in the demographic characteristics in these studies; even those conducted in the same country.

In the current study, physicians were the reported source of information about cervical cancer screening by almost half of the respondents while in another recent nationwide Saudi studies, [15], [19] the main source of information was the internet. This might explain partially the relative higher rate of women heard about pap smear and its importance in the current study. Internet may provide misleading and not reliable information. This finding highlights the importance of engaging of physicians in providing adequate and accurate information to their patients regarding cervical cancer screening.

In the present study, less than one-fourth (23.1%) of the respondents has been screened for cervical cancer and only 2.9% screened for three times or more. This low uptake of cervical cancer screening has been reported also in many previous studies carried out in India [12], and Uganda [22] (13.22% and, 16% respectively). [12] identified that 13.22% of participants had practiced screening. Much of the literature in this study highlighted a gap between knowledge of Cervical Cancer and actual uptake of screening among

community women. While many women have heard of Cervical Cancer, fewer are aware of its symptoms, and far fewer have undergone any type of screening. Yet, many women expressed a positive attitude and willingness to undergo screening despite the low uptake.

On the other hand, [14], published relatively high percentage; 46.1% had actually undergone a Pap smear once or more throughout their lives. Having Pap smear test for women was affected by age and knowledge level about cervical cancer.

In Saudi Arabia, the practice of screening varied. The results of this study were lower than [8], [18] where 33.4% and 26% of participants respectively had practiced screening. On the other hand, it was higher than as reported by [15], [17], [19] (15.3%, 8% and only 2 patients had a Pap smear respectively).

The low level of practice discovered in this study may be related to many significant barriers as reported by participants including lack of awareness, having no enough information about screening test and lack of knowledge about the centers where the test is available. Other barriers also may be the cause as absence of symptoms and lack of advice from treating physicians as reported by higher proportion of the sample however, it is not significantly associated with practice. Availability of pap smear test on Sehaty application will enhance women to perform the test if indicated as reported by most of studied sample.

In line with the findings of the current study, in the literature, the main reported barriers to perform cervical cancer screening were low level of awareness and knowledge, suboptimal perceived risk of cervical cancer, absence of many signs and symptoms in early stage of the disease, cultural and social stigma linked to cancer, fear of cancer diagnosis, price of the test, and embarrassment [24]. Overcoming these barriers is essential to increase the rate of cervical cancer screening performance.

In this study, women with good awareness about cervical cancer and not feeling afraid of screening were more likely to practice screening than their counterparts. This enforces the importance of increasing awareness of women about cervical cancer screening and well as encourage them to do the test without fear. To the best of researcher's knowledge, this study is the first of its kind to investigate the awareness and practice of women regarding cervical cancer screening in Eastern Province, Saudi Arabia. However, some limitations should be mentioned. First of all, the study was carried out in only Eastern Saudi Arabia which affects the ability to generalize the results over other Saudi cities. Second, its design as a cross-sectional study has a problem in the temporal relationship between the dependent and independent variables.

Conclusion: The overall awareness level about cervical cancer screening was poor, although a significant proportion of participants have heard about cervical cancer screening. The uptake of the cervical cancer screening was low.

Recommendations:

1. Recommendations for health care practitioners:

To improve the level of awareness of cervical cancer screening among women age 21 to 65 yrs by

a. Providing Arabic medical brochures for patients concentrating on knowledge about risk factors and symptoms of cervical cancer. Also, the suitable period to start, re-do and stop cervical cancer screening

b. Starting annual campaigns for cervical cancer screening.

c. To understand common barriers for cervical cancer screening and to figure out solution for each barrier.

Increasing patient motivation to take an active role in their health by encouraging them to ask their physician for more information about the screening.

2. Recommendations for the system:

a. Initiating a direct link in Sehaty application for those who want a direct pathway for pap smear testing

b. Increase awareness through educational campaigns, digital advertisements

3. Recommendations for researchers:

4. Further studies are recommended rather than cross-sectional studies to investigate factors affecting practice. Systematic review and meta-anlysis are strongly recommended due to the various studies conducted in different regions in Saudi Arabia.

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