ORIGINAL RESEARCH ARTICLE

Perceptions of barriers to cervical cancer screening among Saudi women: A cross-sectional study

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Abstract

In the Kingdom of Saudi Arabia (KSA), Cervical Cancer (CC) ranked fourth in incidence and associated mortality among all cancers, with a mean age incidence of 61 years. This study evaluates the perceived barriers to CC screening among Saudi women in Najran city, KSA. A cross-sectional study was conducted in Najran/ KSA, involving 1085 females. The data collection instrument comprised three main parts: basic data questionnaire, women's knowledge regarding CC screening, assessment of health belief model scale for CC, and Pap smear test. Data collection started through an online survey from the beginning of October 2021 till the end of January 2022. Data analyses were performed using the Statistical IBM software, version 23 (IBM Corp., Armonk, N.Y., USA). The results showed that fear of bad results (68.9%), cost of treatment (58.8%), embarrassment (59.9%), and preference for female physician (47.4%) among several others were the barriers to CC screening identified by women Over 61% of the participants had a moderate barrier to CC screening, and 24.8% had high perceived barriers. Ordinal logistic regression shows that age, higher education, high monthly income, positive family history for CC, and adequate CC screening knowledge are positive predictors of low CC screening barriers (p<0.05). Increasing number of deliveries and parities was a negative predictor for low CC screening. CC screening barriers are still high among Saudi females. Some demographic variables may predict low CC screening barriers, and health care providers should consider these variables during CC preventive and educational programs. *(Afr J Reprod Health 2022; 26[7s]: 33-42).*

Keywords: Cervical cancer, barriers, screening, papanicolaou test, Saudi Arabia

Résumé

Au Royaume d'Arabie saoudite (Arabie Saoudite), le cancer du col de l'utérus (CC) s'est classé au quatrième rang en termes d'incidence et de mortalité associée parmi tous les cancers, avec une incidence moyenne à l'âge de 61 ans. Cette étude évalue les obstacles perçus au dépistage du CC chez les femmes saoudiennes de la ville de Najran, en Arabie saoudite. Une étude transversale a été menée à Najran/KSA, impliquant 1085 femmes. L'instrument de collecte de données comprenait trois parties principales: un questionnaire de données de base, les connaissances des femmes concernant le dépistage du CC, l'évaluation de l'échelle du modèle de croyance en la santé pour le CC et le test de Pap. La collecte de données a commencé par une enquête en ligne de début octobre 2021 à fin janvier 2022. Les analyses de données ont été effectuées à l'aide du logiciel Statistical IBM, version 23 (IBM Corp., Armonk, N.Y., USA). Les résultats ont montré que la peur des mauvais résultats (68,9 %), le coût du traitement (58,8 %), la gêne (59,9 %), la préférence pour une femme médecin (47,4 %) parmi plusieurs autres étaient les obstacles au dépistage du CC identifiés par les femmes Plus de 61 % des participants avaient un obstacle modéré au dépistage du CC et 24,8 % avaient des obstacles perçus élevés. La régression logistique ordinale montre que l'âge, l'éducation supérieure, un revenu mensuel élevé, des antécédents familiaux positifs pour le CC et une connaissance adéquate du dépistage du CC sont des prédicteurs positifs des barrières au dépistage du CC faible (p<0,05). L'augmentation du nombre d'accouchements et de parités était un facteur prédictif négatif pour le dépistage à faible CC. Les barrières au dépistage du CC sont encore élevées chez les femmes saoudiennes. Certaines variables démographiques peuvent prédire de faibles obstacles au dépistage du CC, et les prestataires de soins de santé devraient tenir compte de ces variables lors des programmes de prévention et d'éducation au CC. *(Afr J Reprod Health 2022; 26[7s]: 33-42).*

Mots-clés: Cancer du col de l'utérus, barrières, dépistage, test de papanicolaou, Arabie Saoudite

Introduction

Worldwide, cancer is a serious health problem, with an estimated 18.1millon newly diagnosed cancer cases and 9.6 million cancer-related deaths in 2018[1] (provide reference). For females, cervical cancer (CC) ranked fourth position in incidence with 570,000 newly diagnosed cases in 2018, representing 6.6% of all female cancers. CC is the second cause of cancer-related deaths in 42 countries worldwide[1]. In Saudi Arabia, there are 366 newly diagnosed corpus uteri cancer cases estimated for 5.8% of all female cancer in 2014. Based on provided statistics, CC ranked fourth position in incidence and mortality rate, and had a mean age of incidence of 61 years[2].

The cause of CC is complex and poorly understood. However, several risk factors have been identified including smoking, immune suppression, increased parity, oral contraceptives, and recurrent infection with sexually transmitted diseases. Human Papillomavirus (HPV) infection is the most crucial risk factor for CC, primarily type HPV 16 and 18[3,4]. Okunade (2020)[5] reported that CC is the most common complication of HPV infection, and about 99.7% is caused by persistent infection with type 16 or 17 HPV. They added that persistent infection with the oncogenic HPV may also cause oropharyngeal and anogenital cancer. From a pathological point of view, HPV can alter cell-cycle control in the epithelial cells leading to uncontrolled cell division and irreversible accumulated genetic damage[5]. Despite the relatively low incidence of CC in KSA, the link between HPV infection CC is comparable to other countries[4].

Screening and preventive CC programs mainly rely on two crucial levels of prevention. The primary level of prevention mainly targets HPV infection prevention, which can be achieved through HPV vaccination. Currently, there are two types of HPV effective vaccines which contain HPV types 16 and 18, and HPV types 6, 11, 16, and 18 virus-like particles[5]. By contrast, secondary level prevention of CC is concerned with the early detection of any deviation or cytological abnormalities of the cervical epithelial cells through Papanikolaou (Pap) smear testing[3]. The primary Pap smear screening can detect any precancerous changes in the cervical mucosa. In addition, molecular detection of HPV DNA or ARN can effectively detect oncologic HPV types. These two protective and preventive strategies are applied in developed and developing countries[3]. HPV vaccines are proven safe and effective in girls more than 15 years of age and may be taken on two or three doses based on the vaccine type[6]. According to the American Academy of Family Physicians, the first Pap smear screening should begin at the age of 21 years and should be repeated every three years. HPV test should be done only in case of positive HPV results. Women aged 30 to 60 should be co-screened by Pap smear and HPV test every five years or every three years with Pap test alone[7].

In Saudi Arabia, there is no organized CC screening program, which accounts for most cases of CC being diagnosed in advanced stages with minimal chance for cure[8]. Therefore, we believe that women's uptake of the CC screening should be encouraged by on women's preferences. In addition, barriers to CC screening should be eliminated or at least decreased to enhance service utilization[9]. Salem *et al.*, 2017 identified numerous barriers to CC screening among Saudi women. They reported that personal fear of embarrassment was the significant barrier for CC screening, followed by healthcare-related factors, including lack of screening sites in the community. Low perceived CC risk, knowledge, and fear of positive results were also documented[10]. In Najran, Saudi Arabia, the gynecologist visit is embarrassing to females; therefore, they delay it to emergencies. In addition, there is no available data regarding CC screening perceived barriers among women in Najran. This signifies the need to explore the barriers to CC screening in Najran to be considered during educational program planning. The current study evaluates cervical cancer screening perceived barriers among Saudi women in Najran city, KSA, with a view to proffer appropriate remediating actions.

Methods

Study design, subjects, and setting

This was a cross-sectional study conducted in Najran/ KSA. Najran is the biggest city in the Najran region and comprises 136,090 females in the

age group of 20 to 60 years. This represents 53.6% of the total females in the Najran region and 23.9% of the total population according to the 2016 Saudi demography Survey[11].

Epi-info, the free sample size calculator, was utilized to determine the sample size according to the required parameters: population size = 136090; anticipated population frequency has low perceived CC screening barriers 50%, absolute precision 5%, and design effect 1%. The total sample size was based on 99.9% confidence interval, and was 1075 participants. A total of 1150 females were included to compensate for the anticipated loss of participants or questionnaire exclusion due to incomplete data. A convenience sampling technique to recruit participants (Any participants accessed the questionnaire and fit to the inclusion criteria were included in the study). Inclusion criteria were females aged 18 to 65 years, married, can read and write, are free from mental illness, and given consent for participation.

Instrument of data collection

The data collection instrument comprised three main parts:

Part I: basic data questionnaire. It was developed to elicit data regarding participants' marital status, residence, education, monthly income, age, age at marriage, marriage duration, gravidity, and parity. In this part, medical history for gynecological operations, genital infections, history of contraceptive use, Pap smear or HPV vaccine, and family history of CC were also explored.

Part II: women's knowledge regarding CC screening: It was adapted from Wood *et al.*, 2019[12]. It comprised seven true or false questions to test women's knowledge regarding CC prevalence, causes, screening, and preventive behaviors. The correct answer scored one, and the incorrect answer scored zero.

Part III: Health belief model scale for CC and Pap smear test: Guvenc *et al.,* 2010 developed this scale

to evaluate the women's health beliefs toward CC[13]. We adopted the part of barriers to Pap smear test. It comprises 14 items scored on a 5-point Likert scale ranging from strongly disagree (1) to strongly agree (5). Higher scores indicate higher barriers to the Pap smear test. The woman will be considered to have low (18-32), moderate (33-51), or high (52-70) perceived barriers to Pap smear test based on her score. Cronbach's alpha coefficients results for the Pap smear barriers subscales were 0.75 and 0.72 for the knowledge part .

The questionnaire was translated to the Arabic language; then, it was evaluated for face and content validity by a jury of five experts in the nursing field. Then it was assessed for reliability by Cronbach alpha coefficient test for the part II and III r=0.72, 0.75, respectively.

Data analysis

Data were entered to Statistical IBM software, version 23 (IBM Corp., Armonk, N.Y., USA)'. The researchers collected1150 questionnaires, and 65 sheets were excluded due to incongruent data. Data analysis was conducted on a 1085 questionnaire. Descriptive statistics as a number, percentage, mean, and standard deviation were used to explore data. Ordinal logistic regression was utilized to explore the predictors of high perceived barriers to Pap smear testing. The total of knowledge and barriers were done by summing items, and percentages were done from the total. The barriers to Pap smear were categorized as low (18-32), moderate (33-51), or high (52-70). P values considered significant at 0.005.

Results

Table 1 shows that 91.7% and 93.9% of the study participants were married and urban area residents, respectively. Besides, 65.3% of the study participants were university or post university educated, and 85.7% reported enough monthly income. History of gynecologic operation, genital infection, contraceptive use, and family cancer were

Table 1: Participants' basic data (n= 1085)

Basic data	N (1085)	%
Marital status		
Married	995	91.7
Divorced	68	6.3
Widow	22	2.0
Residence		
Rural	66	6.1
Urban	1019	93.9
Education		
Secondary school	377	34.7
University or postgraduate	708	65.3
Monthly income		
Not enough	155	14.3
Enough	930	85.7
History of gynecologic operations		
Yes	194	17.9
No	891	82.1
History of genital infection		
Yes	517	47.6
No	568	52.4
History of contraceptive use		
Yes	809	74.6
No	276	25.4
Family history of cancer CC		
Yes	36	3.3
No	1049	96.7
History of taking HPV vaccine		
Yes	11	1.0
No	1074	99.0
History of pap smear screening or HPV Vaccine		
Yes	22	2.0
No	1063	98.0
Age	37.79(7.41)	
Age at marriage mean (SD)	23.03(4.95)	
Marriage duration mean (SD)	15.17(9.73)	
Gravidity mean (SD)	4.34(2.89)	
Parity mean (SD)	3.59(2.35)	

reported by 17.9%, 47.6%, 74.6%, and 3.3% of the study participants, respectively. Almost all study participants did not take the Pap smear test (99%) or HPV vaccine (98). The study participants' mean age, age at marriage, marriage duration, gravidity, and parity were 37.79, 23.03, 15.17, 4.34 and 3.59, respectively.

Table 2: Participants' knowledge regarding Pap smear screening (n= 1085)

Cervical cancer screening knowledge	Percentage of correct answer n (%)
HPV is the most common cause of CC (TRUE)	214(19.7)
HPV vaccination can prevent CC to great extent (TRUE)	356(32.8)
Pap smear is the diagnostic procedure for infection with HPV(FALSE)	515(47.5)
Health care provider collected sample is better than self-collected one (TRUE)	309(28.5)
CC testing should be performed annually (FALSE)	106(9.8)
Pap smear screening is highly accurate in CC diagnosis and have not chance for false results (FALSE)	144(13.3)
Around 20 per 1000 females have cervical Abnormalities at any time point in their life (TRUE)	121(11.2)

Table 2 shows that 19.7% and 32.8 of the participants knew that HPV mainly causes CC and can be prevented by HPV, respectively. In addition, 47.5% and 28.5% understood that the Pap test cannot detect HPV infection, and it would be worse if it has self-collected than provider-collected samples, respectively. A small proportion (9.8% and 13.3%) of the study participants answered that CC screening should not be performed annually and have low sensitivity for CC screening. Only 11.2% of the participants answered correctly regarding the prevalence of CC among women after 20 years.

Table 2 shows the number and percentage of the participants who agreed or disagreed with each perceived barrier to performing a Pap smear test. Fear of bad results (68.9%), cost (58.8%), embarrassment (59.9%), preference of female physician (47.4%), time limitation (41.6%), the anticipation of pain (30.9), lack of knowledge about the procedure (25.9%), too old to have a Pap smear (38.8%), accessibility problems (42.2%), Pap smear

Table 3: Perceived barriers for CC screening (n= 1085)

| Perceived barriers	Strongly disagree		disagree		Sometimes		Agree		Strongly agree	
	No	%	No	%	No	%	No	%	No	%
Fear of bad results may prevent me to go for Pap testing.	18	1.7	109	10.0	210	19.4	473	43.6	275	25.3
Lack of knowledge about the Pap test procedure makes me afraid to have it.	139	12.8	431	39.7	234	21.6	159	14.7	122	11.2
I don't know the health facilities that provides Pap testing.	18	1.7	175	16.1	394	36.3	314	28.9	184	17.0
Shame from lying on the gynecologist table may prevent me to have Pap test.	18	1.7	144	13.3	274	25.3	389	35.9	260	24.0
Pap smear testing is time consuming.	66	6.1	299	27.6	269	24.8	257	23.7	194	17.9
Pap testing procedure is painful.	110	10.1	330	30.4	310	28.6	197	18.2	138	12.7
I feel disrespect of the woman during Pap smear procedure.	56	5.2	249	22.9	269	24.8	300	27.6	211	19.4
I cannot maintain timely Pap test because of negligence or forgetfulness.	53	4.9	279	25.7	250	23.0	297	27.4	206	19.0
Pap test does not take high priority in my life, I have other important things.	32	2.9	187	17.2	446	41.1	248	22.9	172	15.9
I am too old to have a Pap testing on a regular basis.	64	5.9	241	22.2	341	31.4	269	24.8	170	15.7
The health facility that performs Pap testing is so far from my house.	66	6.1	297	27.4	264	24.3	259	23.9	199	18.3
If I am high risk for CC Pap smear have no preventive benefits.	110	10.1	324	29.9	306	28.2	200	18.4	145	13.4
I favor a female physician to perform a Pap testing.	55	5.1	244	22.5	266	24.5	299	27.6	221	20.4
I will never go for Pap testing if it is costly.	20	1.8	144	13.3	283	26.1	388	35.8	250	23.0
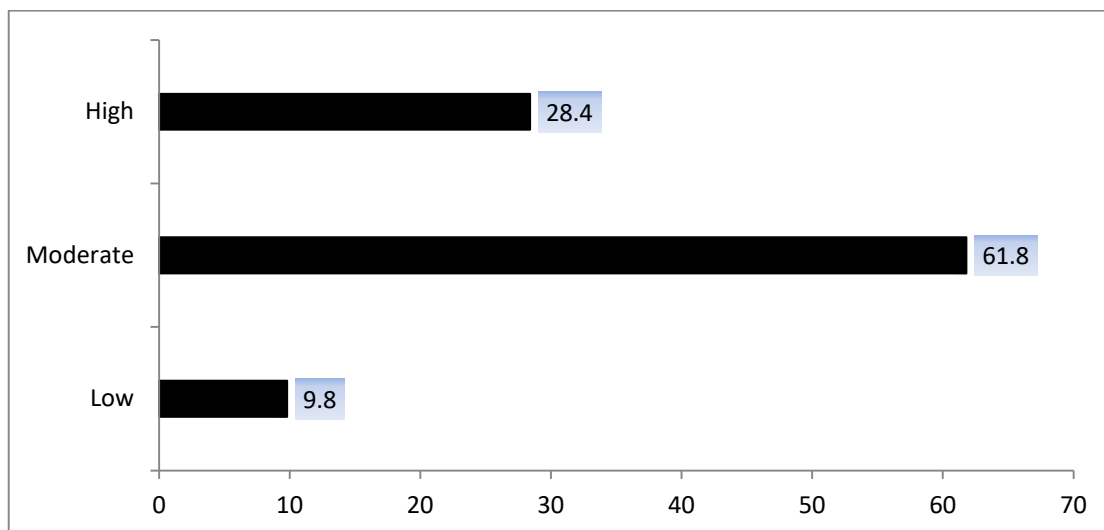
Figure 1: Overall perceived barriers to CC screening (n= 1085)

Table 4: Predictors of low barriers for HPV and Pap smear screening (n= 1085)

Parameter	AOR	p value	95% CI	
			Lower	Upper
Age	1.093	0.000*	1.040	1.028
educational level	1.091	0.031*	0.998	1.193
Monthly income	1.797	0.002*	1.249	2.585
age at marriage	0.979	0.229	0.946	1.013
duration of marriage	0.999	0.969	0.972	1.028
gravida no	1.087	0.056	0.998	1.185
Para no	0.857	0.008*	0.765	0.961
contraceptive use	1.320	0.079	0.968	1.800
Family history of CC cancer	1.810	0.001*	1.259	2.585
Total CC knowledge	1.092	0.000*	1.044	1.142

AOR: Adjusted Odd Ratio   CI: confidence interval * significant at< 0.05

have no preventive benefits (31.8%) and feeling low importance of Pap test (38.8%) were the agreed and strongly agreed on barriers to Pap smear.

Figure 1 illustrates the overall perceived barriers to CC screening. Obviously, 61.8% of the participants had a moderate barrier to CC screening, and 24.8% had high barriers. Approximately one-ten of them had a low barrier.

Ordinal logistic regression in Table 4 shows that increasing age by one year increased the probability of low CC screening barriers [AOR=1.093, p=0.000, CI (1.040-1.028)]. Also, having higher education and high monthly income may increase the probability of having low CC barriers [AOR=1.091, p=0.031, CI (0.998-1.193), AOR=1.797, p=0.002, CI (1.249-2.585)]. An increasing number of deliveries is a negative predictor for low CC screening. An increase in one para may decrease the probability of having low CC barriers [AOR=0.857, p=0.008, CI (0.765-0.961)]. Positive family history for CC significantly increases the probability of low CC screening barriers. [AOR=1.810, p=0.001, CI (1.259-2.585)]. Lastly, increasing the CC screening knowledge may increase the probability of having low CC screening barriers. [AOR=1.092, p=0.000, CI (1.044-1.142)].

Discussion

Exploring the perceived barriers to Pap smear tests is vital before designing any screening program. The current study results indicate that around half of the participants identify fear of a bad result, cost, time limitation, shame from examination, male gynecologist were barriers to performing Pap smear test. Nearly one-quarter of the women revealed that the fear of pain, lack of knowledge about the procedure, old age, poor access to Pap smear, "don't believe that Pap smear is important" are considerable barriers to perform Pap smear.

Similar barriers were reported by Akinlotan *et al.*, 2017 who investigated the barriers for CC screening among uninsured females and their knowledge regarding CC risk factors. They reported that Pap smear cost, fear from test results, and anxiety were essential barriers reported by their participants. They reported embarrassment, anticipated pain, male physician, and lack of knowledge in the second order. Lastly, they reported lack of time, lack of accessibility, and other health care factors as significant barriers[14]. In addition, Kirubarajan *et al.* 2021 conducted a systemic review that included 36 studies performed on 14362 participants to investigate the barriers and facilitators of CC screening among adolescents and young females. They categorized CC screening barriers into three main categories: lack of CC screening knowledge, negative beliefs and perception regarding Pap smear, and systemic barrier test. Lack of knowledge category concerned with poor knowledge regarding CC in general and Pap test in specific. Negative beliefs regarding Pap smear included anticipated pain, embarrassment, male physician, and fear of positive results. The systemic barrier to the test included difficult accessibility, cost, and difficulty in maintaining an appointment schedule[15].

A recent Saudi study conducted by Aldohaian *et al.*, 2019 used the health belief model to assess CC screening behaviors in Riyadh, KSA. Aldohaian *et al.* found that more than three-quarters of their participants reported female physicians' absence as the most crucial barrier to Pap smear screening. The second significant barrier reported by Aldohaian *et al.* participant was a lack of knowledge about Pap smear screening places and the inability to maintain appointment schedules. At the same time, a small proportion of their participants reported that they were too old to

perform Pap smear screening or that their husbands rejected the screening[16].

Another Saudi study conducted in Al Hassa Region KSA to investigate CC screening among female teachers reported similar results. The researchers illustrated that more than half of their participants reported lack of screening sites accessibility, lack of knowledge and educational programs, fear of screening results, anticipated pain, and embarrassment as the main barriers to CC screening[10]. Another qualitative research exploring Muslim women's beliefs toward CC in Canada reported that the absence of female physicians and respecting Muslim women's beliefs are the most critical barriers to CC screening[17]. In addition, Devarapalli *et al.*, 2018 conducted a systemic review on 31 studies to explore the CC screening barriers in low-income countries. They found that lack of knowledge and awareness, embarrassment, lack of time, and family support were the most common barriers reported[18]. Chua *et al.,* 2021 conducted a recent review to elaborate on the CC screening barriers among Southeast Asian women. They concluded that women shy or embarrassed, poor knowledge, and time constraints were the main hindering factors for CC screening program[19].

Embarrassment, male physicians, fear of test results are common barriers among the current and previous studies. This may be because fear and embracement are common human feelings regardless of ethnicity, religion, and nationality. All women need to respect their privacy and appreciate their fear when educating them about CC screening procedures, and this may be the take-home message[17].

Ordinal logistic regression in the current study shows that increasing age by one year increased the probability of low CC screening barriers. Also, having higher education and high monthly income may increase the probability of having low CC screening barriers, increasing CC screening chances. An increasing number of deliveries is a negative predictor for low CC screening. An increase in parity may decrease the probability of having low CC barriers. Positive family history for CC significantly increases the

probability of low CC screening barriers. Lastly, increasing the CC screening knowledge may increase the probability of having low CC screening barriers. It is worth mentioning that this is the first study that tried to reach the predictors for low CC screening barriers among Saudi women; therefore, international comparison in this regard is rare.

The previously mentioned Akinlotan *et al.*, 2017 reported that older women were less likely to be afraid of CC screening results as a barrier than young women[14]. In addition, Wong *et al.*, 2017 who examined the predictors of breast and CC screening among women with chronic renal diseases, reported a significant positive association between age and CC screening behavior[20]. The confirmatory results that older woman may have low CC screening barriers and lower fear from Pap smear results and, consequently, have a higher rate of CC screening than young women seems logical. CC cancer is more common in sexually active older women with recurrent pregnancy and childbirth. The perceived risk for CC may enhance the intention for Pap smear screening and decrease the perceived barriers[21].

Baezconde-Garbanati *et al.,* 2019 surveyed the contributing factors for CC screening barriers among American women and reported a positive association between high CC screening barriers and low education as a personal barrier. They further elaborated that the Pap smear screening cost may contribute to the women's decision to undertake the screening decision, especially if the women don't have enough knowledge regarding CC screening[22].

Although Pap smear test plays a pivotal role in CC screening and the relatively high income of the Saudi population, Pap smear test cost is still a barrier among Saudi women. In the current study, women with high income have a higher probability of having low CC screening barriers when compared with women with low income. Cost, acceptability, and low educational level were also found in developed countries such as America. The same study also elaborated that poor knowledge, negative attitudes, and beliefs are strongly associated with CC screening barriers[22].

Ethical approval

This article is one of a large project supported and approved by Najran University, KSA ethics committee. The approval number is NU/RG/MRC/11/1. Informed consent was provided at the beginning of the electronic questionnaire, and it was required to proceed to questions. The participants were assured that research ethics guidelines protected their data and rights. Anonymity was followed, and data were treated confidentially and for the research purpose only.

Data collection started at the beginning of October 2021 till the end of January 2022. An online survey was first disseminated to the university students; later, they disseminated it to their relatives, friends, and others, through social media, e.g. (Facebook, Twitter, Telegram, WhatsApp, and Instagram). The informed consent and the inclusion criteria were written in the questionnaire introduction

Conclusion

Based on the study results, it can be concluded that fear of bad results, cost, embarrassment, preference of female physician, time limitation, anticipated pain, lack of knowledge about the procedure, too old to have a Pap smear, accessibility problems, Pap smear have no preventive benefits, and feeling low importance of Pap test, are the agreed and strongly agreed on barriers to Pap smear. Around three-fifths of the participants had a moderate barrier to CC screening, and one-quarter had a high barrier. Ordinal logistic regression shows that age, higher education, high monthly income, positive family history for CC, and adequate CC screening knowledge are positive predictors of low CC screening barriers. An increasing number of deliveries and parities are a negative predictor for low CC screening.

Implication of the study

This study explored CC screening barriers among Saudi females to enhance CC screening services utilization. The current study's results may help researchers understand CC screening barriers among Saudi women and the factors associated with low barriers. Furthermore, evidence-based understanding of CC screening barriers may help health care providers to plan effective and need sensitive CC educational and screening services by addressing the identified barriers. Weakness of the study including that the data were collected using a self-administered online questionnaire, which lead exclusion of illiterate women. So, further study was recommended to be conducted through a structured interview schedule. The current study included married and educated women using nonrandom sample in Najran city of Saudi Arabia and may not be generalizable to all Saudi women.

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Consent for publications

The authors have read and approved the publication of the manuscript in its current form. This manuscript has not been submitted for publication elsewhere and has not been previously published.

Competing interests

The authors declare they have no conflict of interest.

Authors' contributions

Elgzar- The conception and design of the study and analysis and interpretation of data, drafting the article and revising it critically for important intellectual content, final approval of the version to be submitted. *Alshahrani*- Drafting the article and revising it critically for important intellectual content, final approval of the version to be submitted. *Al-Thubaity*- Drafting the article or revising it critically for important intellectual content, final approval of the version to be

submitted. *Nahari*- The conception and design of the study and analysis and interpretation of data, drafting the article and revising it critically for important intellectual content, final approval of the version to be submitted. *Ibrahim*- The conception and design of the study, drafting the article or revising it critically for important intellectual content, and final approval of the version to be submitted. *Sayed*- drafting the article and revising it critically for important intellectual content, and final approval of the version to be submitted. *El Sayed*- The conception and design of the study and analysis and interpretation of data, drafting the article and revising it critically for important intellectual content.

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