

ORIGINAL RESEARCH ARTICLE

Saudi women health beliefs and associated factors regarding cervical cancer prevention at Najran city: A theory-based study

DOI: 10.29063/ajrh2022/v26i7s.5

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Abstract

According to Saudi Arabia's 2030 vision, research should be directed to promote health and prevent diseases like cervical cancer (CC). Furthermore, the Kingdom pays specific attention to the health of women. CC ranks eighth among all cancers in Saudi Arabia; therefore, determining women's beliefs and associated factors will help prevent and treat them early. The objective of this study was to explore Saudi women's health beliefs and associated factors regarding CC prevention in Najran city. A cross-sectional design was carried out using a convenience sampling technique of 1085 participants from the Najran region. Data collection was done from June to September 2021, using tools consisting of basic data and personal/family history of the study participants and the health belief model (HBM) scale for CC. The findings revealed that up to 99% of the participants did not take the HPV vaccine, while only 2% undertook the Pap smear test. Less than one-fifth (17.9%) of the participants believed they were highly susceptible to developing CC, although more than two-thirds (70.4%) of them believed CC is a serious disease. Only one-tenth (9.8%) of the participants had low perceived barriers to undergoing a Pap smear test, even though a large proportion (85.3%) of them highly perceived its benefits and were motivated to uptake CC prevention. Rural area residence, low education, insufficient monthly income, and young age were negatively associated factors with CC prevention and health beliefs ($p < 0.05$). Participants with a family history of CC or who previously performed Pap smear test had a higher health motivation and perceived benefits of CC screening and prevention ($p < 0.05$). The study concluded that most Saudi women did not undertake Pap smear tests or HPV vaccine, although average scores of the sub-dimensions of the HBM scale about CC were moderate or high except for perceived susceptibility to CC. Therefore, national educational programs for Saudi women should be directed to increase their perceived susceptibility to CC and decrease the perceived barriers to Pap smear test. In addition, the ministry of health's educational efforts should be directed to rural areas' residents with low education, insufficient monthly income, and young age women. (*Afr J Reprod Health* 2022; 26[7s]: 43-51).

Keywords: Health belief, associated factors, cervical cancer, prevention

Résumé

Selon la vision 2030 de l'Arabie saoudite, la recherche devrait être orientée vers la promotion de la santé et la prévention de maladies telles que le cancer du col de l'utérus (CC). Par ailleurs, le Royaume accorde une attention particulière à la santé des femmes. Le CC se classe au huitième rang parmi tous les cancers en Arabie saoudite; par conséquent, déterminer les croyances des femmes et les facteurs associés aidera à les prévenir et à les traiter tôt. L'objectif de cette étude était d'explorer les croyances des femmes saoudiennes en matière de santé et les facteurs associés concernant la prévention du CC dans la ville de Najran. Une conception transversale a été réalisée à l'aide d'une technique d'échantillonnage de commodité de 1085 participants de la région de Najran. La collecte de données a été effectuée de juin à septembre 2021, à l'aide d'outils constitués de données de base et des antécédents personnels/familiaux des participants à l'étude et de l'échelle du modèle de croyance en la santé (HBM) pour le CC. Les résultats ont révélé que jusqu'à 99 % des participants n'ont pas pris le vaccin contre le VPH, tandis que seulement 2 % ont entrepris le test de Pap. Moins d'un cinquième (17,9%) des participants pensaient qu'ils étaient très susceptibles de développer le CC, bien que plus des deux tiers (70,4%) d'entre eux pensaient que le CC était une maladie grave. Seulement un dixième (9,8 %) des participants avaient de faibles obstacles perçus pour subir un test de Pap, même si une grande proportion (85,3 %) d'entre eux percevaient fortement ses avantages et étaient motivés à adopter la prévention du CC. La résidence en zone rurale, le faible niveau d'éducation, le revenu mensuel insuffisant et le jeune âge étaient des facteurs négativement associés à la prévention du CC et aux croyances en

matière de santé ($p < 0,05$). Les participants ayant des antécédents familiaux de CC ou ayant déjà effectué un test de Pap avaient une plus grande motivation pour la santé et les avantages perçus du dépistage et de la prévention du CC ($p < 0,05$). L'étude a conclu que la plupart des femmes saoudiennes n'avaient pas effectué de test de Pap ou de vaccin contre le VPH, bien que les scores moyens des sous-dimensions de l'échelle HBM concernant le CC aient été modérés ou élevés, sauf pour la sensibilité perçue au CC. Par conséquent, les programmes éducatifs nationaux pour les femmes saoudiennes devraient viser à accroître leur sensibilité perçue au CC et à réduire les obstacles perçus au test de Pap. En outre, les efforts d'éducation du ministère de la santé devraient être dirigés vers les résidents des zones rurales ayant un faible niveau d'éducation, un revenu mensuel insuffisant et les femmes jeunes. (*Afr J Reprod Health* 2022; 26[7s]: 43-51).

Mots-clés: Croyance en matière de santé, facteurs associés, cancer du col de l'utérus, prévention

Introduction

Cervical cancer (CC) is considered the fourth most prevalent gynecologic cancer among women. According to the World Health Organization, about 570,000 were diagnosed with CC in 2018, out of which about 311,000 women died¹. It has been estimated that 1.9 cases per 100,000 women are affected with CC in the Kingdom of Saudi Arabia (KSA)². CC ranks eighth among all cancers in Saudi Arabia, especially in women aged 14 and 45 years. Estimates indicate a prevalence rate of 2.3% of human papillomavirus among Saudi women³.

The most common predisposing factor for CC is HPV infection, which is largely transmitted through sexual intercourse. There are more than 100 types of HPV. Type 16 and 18 are accountable for 70% of cervical precancerous lesions. The most common type of cancer is squamous cell carcinomas, representing about 85%, with adenocarcinoma accounting for about 15%⁴. Other fewer factors associated with increased prevalence of CC include heavy smoking, multiparity, use of immunosuppressive drugs, and early sexual debut. The development from precancerous lesions to invasive cancer takes over 10–20 years⁵. CC does not cause any signs and symptoms in the early stages until it develops to a more advanced stage. Symptoms as bleeding, postcoital bleeding, intermenstrual bleeding, vaginal discharge, dyspareunia, and chronic pelvic pain⁶.

Cervical cancer incidence rate can be reduced by 60-90% and mortality rate by 90% through screening by Pap smear test. It is one of the easiest cancers to treat when detected and managed early¹. The key to prevention is CC screening, which effectively detects precancerous and early cancerous cervical lesions⁷. Socio-cultural beliefs, lack of knowledge, and attitudes among Saudi women towards the HPV vaccine suggest the need to educate and promote awareness of the risk factors and screening of CC and the administration

of the vaccine⁸. The Health Belief Model (HBM) is useful in understanding and changing health behaviors to prevent CC. This model assumes that health behavior is motivated by many components. It describes perceived susceptibility as individuals' beliefs regarding the probability of disease that could adversely affect health and perceived severity as individuals' understanding of the extent of disease severity⁹. Other HBM components are perceived benefits as one's beliefs of the benefit of using preventive strategies toward disease and perceived barriers which determine perceived factors that impede the adoption of healthy behavior as HPV vaccination¹⁰. Since HBM includes modifying factors like socioeconomic status, age, knowledge about CC, and screening measures that affect behaviors, this study applies the HBM to explore Saudi women's beliefs and associated factors regarding CC prevention in Najran city.

Methods

Study design and setting

A cross-sectional design was used for this study. It was implemented in Najran city, KSA. Najran is the major city in the Najran region, with a population consisting of 136,090 women aged 20 to 60 years. This proportion represents 53.6% of the total females in the Najran region and nearly one-quarter of the entire Saudi population, according to the 2016 Saudi demography Survey¹¹.

Participants and sample size

Epi-info, the free sample size calculator, was used to determine the sample size according to the following parameters: population size = 136,090; anticipated frequency of population have low health beliefs toward CC 50%, absolute precision 5%, and design effect 1%. The total sample size of 1075 participants was calculated based on a 99.9%

confidence interval. A total of 1150 females were included to compensate for the anticipated loss of participants or questionnaire exclusion due to incomplete data. Sixty-five responses were excluded due to incongruent data, so data analysis was conducted on 1085 completed questionnaires. A convenience sampling technique was used to recruit participants. Inclusion criteria were women aged 18 to 65 years, married, can read and write, and agreed to participate in the study.

Data collection instrument

Data were collected using an online survey. It was developed by researchers after reviewing the related literature and contained two parts. *The first part* included basic data and personal/family history of the study participants like age, residence, education, monthly income, history of gynecologic operations, genital infection, contraceptive used, taking human papillomavirus vaccine, Pap smear screening, family history of CC, duration of the marriage, gravidity, and parity. *The second part* was the HBM scale for CC and Pap smear test: It was developed by Guvenc *et al.*⁹. The scale contained 35 items and was divided into five subscales susceptibility to CC (3 items), perceived seriousness of CC (7 items), barriers to Pap smear test (14 items), benefits of Pap smear test (4 items), and health motivation (7 items). In each item, the participant has to choose one of five alternatives: strongly agree= 5, agree =4, neutral =3, disagree =2, and strongly disagree=1. Higher scores reveal greater feelings regarding the construct. All scales are positively associated with CC screening behavior except for barrier items, which have a negative association⁹.

A jury of five experts in obstetrics and gynecology and a biostatistician tested the instrument's validity. The instrument reliability was tested through Cronbach's alpha coefficient test. Cronbach's alpha coefficients results for the five subscales ranged from (0.62 to 0.86), which showed an adequate internal consistency of the instrument.

Data collection procedure and analysis

Data were collected from June to September 2021. An online survey was first disseminated to the university students; later, they disseminated it to their relatives, friends, and others through social media (Facebook, Twitter, Telegram, WhatsApp, and Instagram).

Informed consent was written at the beginning of the electronic questionnaire, and if the participants agreed, the next step was the detailed questions. The participants had the right to refuse participation without any penalties.

Data analysis was performed using the IBM software, version 23 (IBM Corp., Armonk, N.Y., USA). The participants' basic data and personal/family history were represented using descriptive statistics. The health beliefs concerning CC were described in terms of numbers and percentages. Independent t-tests were performed to assess the relationship between selected basic data and the HBM subscale. The correlation between participants' health beliefs and other selected basic variables was examined using the Pearson correlation coefficient test (Pearson's r).

Results

Table 1 shows that 91.7% and 93.9% of the study participants were married and lived in urban areas, respectively. Furthermore, 65.3% of the study participants were highly educated, and 85.7% reported adequate monthly incomes. History of gynecologic operation, genital infection, contraceptive use, and family cancer were reported by 17.9%, 47.6%, 74.6%, and 3.3% of the study participants, respectively. Up to 99% did not take the HPV vaccine, while only 2% undertook the Pap smear test. The mean ages of the study participants at marriage, marriage duration, gravidity, and parity were 37.79, 23.03, 15.17, 4.34, and 3.59, respectively.

Table 2 shows that only 17.9% of the participants believed that they were highly susceptible to develop CC, although more than two-thirds (70.4%) of them believed that CC is a serious disease. The participants with moderate and high barriers to Pap smear test were 61.8% and 28.4%, respectively. Similarly, 85.3 % of the participants had high perceived benefits of undergoing a Pap smear test, while 79% were motivated to promote their health to prevent CC.

Table 3 shows that women who resided in rural areas were less likely to perform Pap smear test, while women in urban areas had high health motivation. Women with a university education were more likely to perceive CC as serious and believed more in the benefits of the Pap smear test as compared to women with secondary-level education.

Table 1: Demographic characteristics of study participants (n= 1085)

Basic data	n (1085)	%
Mean (S.D.)		
Marital status		
Married	995	91.7
Divorced	68	6.3
Widowed	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 CC		
Yes	36	3.3
No	1049	96.7
History of taking human papillomavirus vaccine		
Yes	11	1.0
No	1074	99.0
History of pap smear screening		
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)	

Women reporting insufficient monthly incomes had higher barriers to do a Pap test than women who reported adequate monthly income. In addition, women with a family history of CC had higher perceived seriousness of CC, benefits of Pap smear test, and health motivation than women without a family history of CC. Women with a history of Pap smear screening have higher perceived benefits of Pap smear test and health motivation than the women who did not perform it before. All identified differences are statistically significant, $p < 0.05$.

Table 2: Study participants' health beliefs related to CC (n= 1085)

Health beliefs	Low n(%)	Moderate n(%)	High n(%)			
susceptibility to CC	445	41.0	446	41.1	194	17.9
seriousness of CC	27	2.5	294	27.1	764	70.4
Barriers to Pap smear test	106	9.8	671	61.8	308	28.4
Benefits of Pap smear test	16	1.5	143	13.2	926	85.3
Health motivation	18	1.7	210	19.4	857	79.0

Table 4 shows statistically significant positive correlations between all HBM constructs ($p < 0.05$) except for the barriers construct. Barriers to the Pap smear test were negatively correlated to the other four HBM ($p < 0.05$). The participant's age was positively correlated with the perceived seriousness, benefits of Pap smear, and health motivation ($p < 0.05$). The number of gravidae was positively correlated with the benefits of Pap smear and health motivation; furthermore, parity was positively correlated to health motivation ($p < 0.05$).

Discussion

The current study results indicated that almost all participants did not take the HPV vaccine or Pap smear test. This result indicates the low utilization of CC screening and preventive measures by Saudi women in Najran city and reflects that women perceived susceptibility to CC was low. Pap smear test performance and HBV vaccination rates reported in the current study are less than those reported in similar studies conducted in other KSA regions, including Aseer (27%), Qassim (15.3%), and Jeddah (16.8)¹²⁻¹⁴. Another study conducted using an online survey in different KSA regions reported that 8% of their participants performed Pap smear test. At the same time, they reported a low rate of HPV vaccination (2%), similar to the current study¹⁵. These variations between the current study results and the latter study group may be attributed to Bedouin culture in the Najran region. In Bedouin culture, there are many restrictions on the female visit to the gynecologist, especially for the preventive reasons. In addition, more than four-fifths of current study participants perceived themselves at moderate or low risk of CC. Another Iranian study investigated CC preventive behavior using HBM by Mehraban *et al.*

Table 3: Relationship between selected basic data and HBM subscale (n= 1085)

Basic data	Perceived susceptibility Mean(SD)	Perceived seriousness Mean(SD)	Barriers to Pap smear test Mean(SD)	Benefits of Pap smear test Mean(SD)	Health motivation Mean(SD)
Residence					
Rural	9.09(3.24)	27.16(4.57)	49.09(9.27)	16.57(2.83)	26.54(4.54)
Urban	8.28(3.05)	27.45(5.31)	45.81(11.03)	17.22(2.84)	29.04(5.02)
t test(P-value)	1.950(0.055)	0.488(0.627)	2.749(0.007)	1.813(0.074)	4.298(0.000)
Education					
Secondary school	8.16(3.13)	26.93(5.50)	45.64(10.96)	16.90(3.01)	29.09(4.74)
University or postgraduate	8.43(3.03)	28.37(4.67)	46.20(10.96)	17.72(2.41)	28.77(5.17)
t test(P-value)	1.367(0.172)	4.309(0.000)	0.809(0.419)	4.562(0.000)	1.024(0.306)
Monthly income					
Not enough	8.64(3.055)	27.20(5.78)	47.80(10.52)	17.28(2.95)	28.04(5.88)
Enough	8.28(3.07)	27.47(5.18)	45.71(11.01)	17.17(2.82)	29.03(4.86)
t test(P-value)	1.350(0.179)	0.556(0.579)	2.278(0.024)	0.434(0.665)	1.974(0.050)
Family history of CC					
Yes	8.43(3.07)	27.70(5.08)	45.18(11.29)	17.41(2.72)	29.07(5.02)
No	8.04(3.05)	26.64(5.73)	46.29(10.84)	16.53(3.098)	28.33(5.02)
t test(P-value)	1.853(0.065)	2.881(0.004)	1.421(0.156)	4.199(0.000)	2.130(0.034)
History of Pap smear screening					
Yes	8.36(3.47)	28.54(5.18)	41.72(16.25)	18.90(1.30)	32.00(3.46)
No	8.33(3.06)	27.42(5.27)	46.05(10.90)	17.17(2.85)	28.85(5.03)
t test(P-value)	0.024(0.981)	0.713(0.492)	1.303(0.193)	4.327(0.001)	2.977(0.013)

t: independent t-test; P is statistically significant at $p < 0.05$

Table 4: Person correlation between participants' health beliefs and selected basic variables (n= 1085)

participants' variables		Perceived susceptibility	Perceived seriousness	Barriers to Pap smear test	Benefits of Pap smear test	Health motivation
Perceived seriousness	r	0.308**				
	p	0.000				
Barriers to Pap smear test	r	-0.479**	-0.339**			
	p	0.000	0.000			
Benefits of Pap smear test	r	0.097**	0.553**	-.193**		
	p	0.001	0.000	.000		
Health motivation	r	0.105**	0.338**	-.164**	0.525**	
	p	0.001	0.000	.000	0.000	
Age	r	0.034	0.063*	.009	0.087**	0.176**
	p	0.258	0.037	.779	0.004	0.000
age at marriage	r	-0.026-	0.042	.029	-0.024-	-0.017-
	p	0.390	0.128	.339	.432	0.568
Number of gravidas	r	0.017	0.046	.008	0.074*	0.148**
	p	0.565	0.130	.786	0.015	0.000
Number of paras	r	0.042	0.039	.041	0.052	0.156**
	p	0.168	0.198	.178	0.088	0.000

P is statistically significant at $p < 0.05$

Surprisingly, they reported that more than half of their participants performed a Pap smear test¹⁶. The differences between the current study findings and the Mehraban *et al.* study may be attributed to the difference in perceived susceptibility to CC, where 46% of Mehraban *et al.* participants perceived themselves as at high risk of CC. While in the current study, only 17.9% of the participants believed that they were highly susceptible to develop CC.

Cultural factors, false beliefs, and lack of knowledge and awareness of Saudi women regarding HPV and Pap smear test are considered the key factors contributing to the low uptake of HPV vaccine and Pap smear test^{17,15}. In addition, the concept of preventive medicine is not too popular in Saudi Arabia; health-seeking is only considered if the woman has CC signs and symptoms. This is interpreted by the current study results showing low perceived susceptibility to CC,

reflecting the urgent need to raise Saudi women's awareness about CC preventive and screening measures. Similar findings were reported by Shrestha and Dhakel, who found that more than half of their study participants perceived themselves are not susceptible to CC; even though most of them had early sexual relations, only a small proportion did CC screening¹⁸.

Although more than two-thirds of the current study participants believed in the seriousness of CC, these beliefs did not reflect on their performance of a Pap smear test or HPV vaccine uptake. In addition, more than half of them perceived moderate barriers to perform Pap smear test as ashamed women, especially in the absence of female health care providers. They perceived the test as a painful procedure and lacked awareness of the importance of prevention. Incongruent with the current study, Mehraban *et al.* found high perceived severity among more than half of the study participants, and nearly half of them had moderate barriers¹⁶.

In addition, the present study revealed that more than three-quarters of participants had high-perceived benefits from performing Pap smear test and were motivated to promote their health to prevent CC. A similar finding was reported by Jeihooni *et al.*, who found that high perceived benefits of the Pap smear test were reflected in its undertaking rate¹⁹. Furthermore, Okesiji and Amosu's study revealed that the majority of the respondents had a moderate perception of screening benefits and CC seriousness²⁰. In addition, the study conducted in the KSA by Aldohaian *et al.* reported high benefits of Pap smear test and health motivation scores and low scores of perceived barriers among Saudi women regarding CC screening²¹. Besides, Jassim *et al.* found that more than half of the participants highly perceived the benefits of CC screening on early detection and treatment of CC²².

The current study results revealed that women who live in rural areas have the highest barriers to perform Pap smear test, while women in urban areas are more motivated to do screening test. It is expected that rural areas receive little attention regarding health services and health education programs. In addition, the Bedouin culture may be the most important barrier to female access to preventive, therapeutic, or educational health services. In the same line, Salem *et al.* investigated the perceived barriers to CC screening among

secondary school female teachers in Al Hassa, KSA. They reported that urban area residents had a 3.39 higher chance to perform CC screening when taking rural areas as a reference. They justified their results by the difficult accessibility, lack of public transportation, and high cost of health services in rural areas compared to urban area²³. In addition, the current study found that women with insufficient monthly income have higher barriers to perform a pap test than women with adequate monthly income. This is not surprising and reflects that participants in the current study do not pay too much attention to preventive medical practice. In the same line, Salem *et al.* reported that 19.8% of their participants were not ready to pay for cervical cancer screening in Al Hassa region, KSA. They further added that 21.5% of their participants did not accept screening unless CC signs and symptoms appeared. Furthermore, Chua *et al.* conducted a systemic review of 93 studies to evaluate the barriers and facilitators of CC screening among Southeast Asia women. They found that the cost is one of the most important barriers to Pap smear test²⁴. Furthermore, both Chang *et al.*²⁵ and Okesiji and Amosu²⁰ found that willingness to participate in CC screening is greatly affected by household income or whether a person is rich or poor. Another Jordan study conducted by Al-Amro *et al.* found that 65.5% of their participants were unwilling to pay for the Pap smear test²⁶.

Additionally, the current study revealed that women with a family history of CC had higher perceived seriousness of CC and benefits of Pap smear test and were more motivated than women without a family history of CC. The current study results may be explained by the fact that any past experience of disease exaggerates more fear and anxiety. Suffering during CC diagnosis and treatment with a loved one may be an unforgettable experience. Similar results were reported by Jia *et al.* They found that women with parents' history of cancer are sensitive to this issue and more willing to uptake CC screening tests regardless of any barriers²⁷. Besides, Cetisli *et al.* reported that women with a positive family history of cancer are more liable to perform a Pap smear test. Furthermore, they illustrated that highly educated women recognize the importance of the Pap smear test and CC preventive measures²⁸. The current study also emphasized the importance of education in perceiving CC seriousness and decreasing the barriers to Pap smear test. The current study

findings also confirmed that women with a history of Pap smear screening have a higher perception of its benefits. Similarly, a study conducted by Çınar *et al.* illustrated that regular gynecological examination was a positive predictor for Pap test performance and the identification of the perceived benefit of screening²⁹.

Finally, the current study reported a significant positive correlation between all HBM constructs except for the barriers to the Pap smear test, which was negatively correlated to the other four HBM constructs. This finding was supported by a study by Cetisli *et al.*, who confirmed a negative relationship between Pap smear barriers and the HBM subscales score²⁸.

Health beliefs are the most important motivator of any health-seeking behavior. If the woman perceives herself as at risk for CC and its seriousness, she will be able to overcome the barriers to Pap smear test and be more motivated to take preventive measures. Furthermore, the current study findings showed that rural area residence, low education, insufficient monthly income, and young age were negatively associated factors with CC prevention and health beliefs. Similarly, the previously mentioned study by Chisale Mabotja *et al.* found that older women were more knowledgeable regarding CC, motivated to perform CC screening, and more likely to perceive the CC seriousness³⁰. Furthermore, the previously mentioned two studies conducted by Okesiji and Amosu, and Özen Çınar and Kara emphasized the significant relationship between participants' age and CC screening practices^{20,29}.

Additionally, the previously mentioned study by Aldohaian *et al.* detected that women with more children perceived themselves as more at risk for CC²¹. Therefore, national educational intervention for Saudi women should be implemented to increase their perceived susceptibility to CC and decrease the perceived barriers to Pap smear test. Especial attention should be directed to rural area residents with low education, insufficient monthly income, and young age women.

Study strengths and limitations

The current study has some limitations. First, a cross-sectional design was followed in the current study; therefore, no causal relationships could be drawn. Second, although this study provides

important information on health beliefs and its associated factors regarding CC prevention among women in Najran society, it is considered the first phase study. To deal with these limitations, further intervention studies directed to socio-cultural beliefs and misconceptions and guided by the results of our study are recommended in different geographical areas in KSA that include different segments of Saudi populations.

Ethical considerations

The deanship of scientific research approved the study at Najran University. Informed consent was taken from each participant before data collection on the first page of the self-reported questionnaire, and participant anonymity was applied. The participants were informed that all data was confidential and used only for the research objective.

Conclusion

Less than one-fifth of the participants believed that they were highly susceptible to develop CC, although more than two-thirds of them believed that CC is a serious disease. Only one-tenth of the participants had low perceived barriers to undergo a Pap smear test, even though a large proportion of them highly perceived its benefits and were motivated to uptake CC prevention. Rural area residence, low education, insufficient monthly income, and young age were negatively associated factors with CC prevention and health beliefs. Participants with a family history of CC or who previously performed Pap smear test had a higher health motivation and perceived benefits of CC screening and prevention. National educational programs for Saudi women should be directed to increase their perceived susceptibility to CC and decrease the perceived barriers to Pap smear test. In addition, the ministry of health's educational efforts should be directed to rural areas' residents with low education, insufficient monthly income, and young age women.

Acknowledgment

The authors are thankful to the Deanship of Scientific Research at Najran University for funding this work under the General Research Funding program grant code (NU/RG/MRC/11/1).

Consent for publications

The authors had 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.

Conflict of interests

None.

Authors' contributions

Ibrahim- 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. *Nahari*- 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. *Alshahrani*- 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. *Elgzar*- 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. *El Sayed*- drafting the article and revising it critically for important intellectual content, and final approval of the version to be submitted. *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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Health beliefs regarding cervical cancer prevention

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