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Cervical cancer perceived risks and associated factors among women in Saudi Arabia: A cross-sectional study

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Abstract

Examining the risk perception of one of the most life-threatening cancers among women, such as cervical cancer, will guide the development of targeted advocacy and educational programs to reduce the burden of the disease. The current study investigated cervical cancer perceived risks and associated factors among Saudi women. A cross-sectional study was conducted through a social media-based survey, which conveniently targeted 1085 Saudi women in Najran city. The survey questionnaire consisted of four parts: basic sociodemographic data, cervical cancer knowledge quiz, attitude scale, and risk perception Scale. The present study confirmed that 57.4% of the study participants had high-risk perception regarding cervical cancer. Among the study participants, 42.6% had a low perception of the risk of cervical cancer, 57.3% had unsatisfactory knowledge, while 59.4% had a positive attitude (59.4%) towards cervical cancer prevention and its screening. The binary logistic regression proved that the positive significant factors associated with risk perception were higher education [AOR=3.105 (1.300 - 7.418), p=0.011], increasing age [AOR=1.191 (1.043-1.359), p=0.005], longer duration of marriage [AOR=3.123 (1.112 - 8.767), p=0.031], having family history of cancer/cervical cancer [AOR=4.498 (1.119 - 18.085), p=0.034], satisfactory knowledge [AOR=2.304 (1.289 - 4.116), p=0.005], and positive attitude [AOR=3.248 (2.532 - 4.166), p=0.000]. We conclude that more than half of the women in Najran city had high cervical cancer-related risk perception while more than two-fifths perceived low risk with unsatisfactory knowledge and a positive attitude. These results highlight the pressing need to develop cervical cancer health education programs to foster risk perception as a driving strategy for the prevention of cervical cancer in Saudi Arabian women. *(Afr J Reprod Health 2022; 26[7s]:13-22).*

Keywords: Cervical cancer, risk perception, Saudi Arabia

Résumé

L'examen de la perception du risque de l'un des cancers les plus mortels chez les femmes, comme le cancer du col de l'utérus, guidera l'élaboration de programmes ciblés de sensibilisation et d'éducation pour réduire le fardeau de la maladie. La présente étude a examiné les risques perçus du cancer du col de l'utérus et les facteurs associés chez les femmes saoudiennes. Une étude transversale a été menée par le biais d'une enquête basée sur les médias sociaux, qui ciblait commodément 1085 femmes saoudiennes dans la ville de Najran. Le questionnaire de l'enquête comportait quatre parties: données sociodémographiques de base, quiz sur les connaissances sur le cancer du col de l'utérus, échelle d'attitude et échelle de perception du risque. La présente étude a confirmé que 57,4 % des participants à l'étude avaient une perception à haut risque concernant le cancer du col de l'utérus. Parmi les participants à l'étude, 42,6 % avaient une faible perception du risque de cancer du col de l'utérus, 57,3 % avaient des connaissances insatisfaisantes, tandis que 59,4 % avaient une attitude positive (59,4 %) envers la prévention du cancer du col de l'utérus et son dépistage. La régression logistique binaire a prouvé que les facteurs significatifs positifs associés à la perception du risque étaient l'éducation supérieure [AOR=3,105 (1,300 - 7,418), p=0,011], l'âge croissant [AOR=1,191 (1,043-1,359), p=0,005], l'allongement durée du mariage [AOR=3,123 (1,112 - 8,767), p=0,031], ayant des antécédents familiaux de cancer/cancer du col de l'utérus [AOR=4,498 (1,119 - 18,085), p=0,034], connaissance satisfaisante [AOR=2,304 (1,289 - 4,116), p=0,005], et attitude positive [AOR=3,248 (2,532 - 4,166), p=0,000]. Nous concluons que plus de la moitié des femmes de la ville de Najran avaient une perception élevée du risque lié au cancer du col de l'utérus tandis que plus des deux cinquièmes percevaient un faible risque avec des connaissances insatisfaisantes et une attitude positive. Ces résultats mettent en évidence le besoin pressant de développer des programmes d'éducation à la santé sur le cancer du col de l'utérus afin de favoriser la perception du risque en tant que stratégie motrice pour la prévention du cancer du col de l'utérus chez les femmes saoudiennes. *(Afr J Reprod Health 2022; 26[7s]:13-22).*

Mots-clés: Cancer du col de l'utérus, perception du risque, Arabie Saoudite

Introduction

Cervical cancer (CC) is widespread cancer among women in middle age and ranks as the fourth one universally. Reports indicate 1.9 cases of CC per 100,000 women in Saudi Arabia[1,2]. CC ranks as the eighth most common cancer in Saudi Arabia, especially among women aged between 14 and 45 years. The Saudi Information Centre on human papilloma virus (HPV) and CC estimated that 2.5% of women were diagnosed with infection with the human papillomavirus (HPV)[3]. The World Health Organization declared that HPV infection is roughly responsible for all cases of CC[4]. Other risk factors that predispose to CC include early sexual debut (<16 years old), multiple sexual partners, exposure to hormones, genetic factors, smoking high parity, and low socioeconomic status. The transition of precancerous lesion to invasive CC takes up to 20 years[5-7].

Previous studies indicate that Saudi women display low awareness about the prevention and screening of CC and ignore the effect of HPV infection and the importance of vaccination[8,9]. While nearly one-third of Saudi women have been reported to be positive for HPV DNA[10], a study in the Aseer region had shown that the awareness of Saudi females regarding CC and its screening behaviors were relatively poor. Furthermore, screening practices in the country are minimal and mostly performed based on the physicians' instructions. More attention is needed to increase women's knowledge and practices regarding CC screening[11]. Regrettably, in developing countries, including Saudi Arabia, most women represent with clinically progressive CC stages that require extensive survival therapy[12]. Precancerous cervical lesion screening is recommended and should be started three years after marriage up to sixty-five years of age. Evidence exist to indicate that HPV testing and vaccination can effectively prevented CC[9,13].

Several factors have been identified at the community and individual levels that serve as obstacles to CC screening among women. Among these factors, include supply factors - poorly prepared health facilities and lack of national CC screening programs[14], while demand factors are the low level of CC-related knowledge, cultural norms, the high cost of CC screening, poor individual health-seeking behaviors, and limited social networks. The overarching influence is risk perception, evidenced as a driving force for health-related decision-making and preventive health actions[15,16]. It denotes the individual awareness of women's vulnerability for getting a specific health threat and its associated health influence[17].

Risk perception is greatly targeted in numerous theory-driven interventions as a central construct in behavioral change modification. These include but are not limited to, health promotion model[18], self-regulation model[19] and protection motivation theory[20], and health belief model[21]. Consequently, perceiving the CC risk might encourage women to conduct CC screening and get HPV vaccine to safeguard their health. Consequently, it is essential to recognize the determinants of individuals' risk perception and the associated factors to base the development of efficient risk communication to motivate the adoption of health-promoting behaviors[17,22].

In consonance with Saudi vision 2030, which highlights the importance of prevention, a great effort is required to foster the implementation of the national CC screening program to be accessible and affordable for all women. Furthermore, efforts are required to encourage CC preventive measures through in-depth understanding and addressing the obstacles for such prevention among the target group[23,24]. Therefore, the present study investigated CC perceived risk and associated factors among Saudi women in Najran city.

Methods

Study design and subjects

A cross-sectional design was adopted for this study. It was conducted in Najran city, KSA, considered the major city in the Najran region. According to the Saudi Demographic and Health Survey (2016), 136,090 women aged 20 to 60 years were interviewed in the Najran region, representing 53.6% of the total females in the region and nearly one-quarter of the whole population[25]. The researchers used a convenience sampling technique to recruit participants who met the inclusion criteria: married women aged 18 to 65 years, can read, and

write, are free from mental illness, and agreed to participate in the study.

The sample size was determined using the Epi-info free sample size calculator according to the following parameters: population size = 136090; 50%, anticipated frequency of low perceived CC risk among Najran women, 5% absolute precision, 95.0% confidence interval, and 1% design effect. The calculated sample size was 1075 participants, and the final total number of women included in the study was 1150 to compensate for unmatched criteria. Sixty-five sheets were excluded because of incongruent data, so data analysis was conducted on questionnaire retrieved from 1085 women.

Data collection instrument

Data was collected using an online survey. It was developed by researchers after reviewing the related literature and contained four sections:

Section 1 included the participants' basic sociodemographic data including age, residence, education, monthly income, history of gynecologic operations, genital infection, contraceptive used, HPV vaccine, pap smear screening and family history of CC, duration of the marriage, gravidity, and parity.

The second section was elicitation of risks using the risk perception scale. It was adapted from a previous study[26.27]. It contained ten items scored on a five-point Likert scale (1-5) from strongly disagree to strongly agree (please list some of the questions asked in the scale). The overall risk perception score was obtained (10-50) and categorized as low (10-30) and high (30-50) levels. Its reliability was investigated using Cronbach's alpha which reflected good internal consistency (r= 0.799).

The third section was the CC knowledge quiz. It was adapted from prior studies[28,29] and comprised 14 dichotomous (yes/no) questions to assess the participants' knowledge regarding CC risk factors, symptoms, and screening measures. Please, insert some of the questions under knowledge that were asked here. The incorrect answer scored zero, and the correct answer scored one. Therefore, the overall quiz score was estimated (14) and leveled into unsatisfactory (0- 8) and satisfactory (9-14) knowledge. The reliability of the knowledge quiz was assessed using Cronbach's alpha, and its result indicated good internal consistency (r= 0.823).

The fourth section obtained information on CC attitude scale. It was adapted from a previous study by Getaneh *et al.*, 2021[30], which comprises nine items ranked on a 5-points Likert scale from strongly agree (5) to strongly disagree (1). Please, input some of the questions that were asked in the attitude scale here. The overall scale score ranged from 9 to 45. The participant was considered to have a negative attitude if her overall score fell between (9 -27) and a positive attitude if her overall score was between (28 -45). The reliability of the attitude scale was assessed using Cronbach's alpha, and its result indicated good internal consistency (r= 0.785). In addition, the researcher translated the questionnaire into the Arabic language, and it was examined for face, content, and construct validity by a jury of six experts in the specialty and portrayed a good Content Validity Index (CVI=0.79).

Pilot testing

The provisional data collection form was tested on 100 women beyond the predetermined sample size. It aimed to examine the women's acceptability and comprehension of the questions, clarify ambiguity (if present). Minor modifications were done accordingly.

Data collection procedure

Data was collected between the beginning of October 2021 until the end of January 2022. An online survey was disseminated through numerous social media platforms (Facebook, Twitter, Telegram, WhatsApp, and Instagram). The time elapsed for filling the questionnaire was 10-14 minutes, with a high response rate among the Najran females.

Data analysis

Data analysis was performed using the Statistical IBM software, version 23 (IBM Corp., Armonk, N.Y., USA). The participants' basic data and personal/family history were represented using descriptive statistics. Knowledge, attitude, and risk perception toward CC were described in terms of numbers & percentages. Binary logistic regression was performed to assess the predictors of CC risk perception. The adopted significance level in the current study was 0.05.

Results

Table 1 shows that most of the study participants were married (91.7%) and were urban residents (93.9%), highly educated (65.3%), and had adequate monthly income (85.7%). Many participants report having had gynecologic operation (17.9%), genital infection (47.6%), contraceptive use (74.6%), while only 3.3 % reported a family history of cancer (3.3%). Nearly all the study participants reported no previous Pap testing (98.0%) or HPV vaccination (99.0%). The mean age of the study participants was 37.8 (add Standard deviation), while the mean of their marriage-age (23.03), marriage duration (15.17), gravidity (4.34), and parity (3.59). Note that all percentages must be given in one decimal place only.

Table 2 illustrates that 39.2% of the study participants thought that they would not have CC in the future. By contrast, 44.7% and 59.2% of the study participants reported a low chance of getting CC in the next few years or at any time point of their life, respectively. Regarding CC seriousness, 56.4% perceive that just the thought of CC could scare them, while 76.2% of them would experience increasing heartbeats. Around four-fifths (81.0% and 79.0%) of the study participants reported that they would be afraid to think about CC and consider that the problems caused by CC often take a long time. The fact that CC would threaten the relationship with their husbands was agreed to by 56.3%, while 81.0% reported that if they had CC, their whole life would change. Lastly, 76.3% of the study participants thought that CC would end their life within five years.

Table 3 illustrates that 57.3% of the study participants have unsatisfactory CC knowledge and 59.4% have a positive attitude towards it. Besides, 57.4% of the study participants have a higher risk perception regarding CC.

Based on the binary logistic regression shown on Table 4, education, family history of CC, CC knowledge and attitude, age, and marriage duration are significant associated factors for CC risk perception. University or postgraduate participants had three-time higher probability of having high CC risk perception when compared with secondary school education [AOR=3.105 (1.300 - 7.418), p=0.011].

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

Basic data	No (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 education	377	34.7
University/postgraduate education	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 and/or CC		
Yes	36	3.3
No	1049	96.7
History of HPV vaccination		
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)	
Marriage Age 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)	

Having a family history of CC increased the chance of having higher CC risk perception four times compared with families with no CC history [AOR=4.498 (1.119 - 18.085), p=0.034]. Besides, when taking unsatisfactory knowledge as a reference, women with satisfactory knowledge have a 2.3 higher probability of having high CC risk perception [AOR=2.304(1.289 - 4.116), p=0.005]. Positive CC attitudes increased the probability of high CC perceived risk 3.24 times than negative attitudes [AOR=3.248 (2.532 - 4.166), p=0.000]. In addition, increasing age and marriage duration increased the woman probability to have high CC perceived risk [AOR=1.191 (1.043-1.359), p=0.005] and [AOR=3.123 (1.112 - 8.767), p=0.031].

Table 2: Perceived risk for CC (n= 1085)

Items	Strongly disagree		Disagree		Sometimes		Agree		Strongly agree	
	No	%	No	%	No	%	No	%	No	%
It is likely that I will get CC in the future	110	10.1	316	29.1	390	35.9	172	15.9	97	8.9
My chances of getting CC in the next few years are high	155	14.3	341	31.4	349	32.2	151	13.9	89	8.2
I feel I will get CC sometime during my life	156	14.4	345	31.8	285	26.3	167	15.4	132	12.2
The thought of CC scares me	20	1.8	190	17.5	262	24.1	415	38.2	198	18.2
When I think about CC, my heart beats faster	162	14.9	82	7.6	15	1.1	488	45.0	338	31.2
I am afraid to think about CC	51	4.7	45	4.2	110	10.1	450	41.5	429	39.5
Problems I would experience with CC would last	13	1.2	46	4.2	169	15.6	497	45.8	360	33.2
CC would threaten a relationship with my husband	20	1.8	190	17.5	264	24.3	417	38.4	194	17.9
If I had CC, my whole life would change	15	1.4	45	4.1	146	13.5	445	41.0	434	40.0
If I developed CC, I would not live longer than 5 years	165	15.2	44	4.1	48	4.4	471	43.4	357	32.9

Table 3: Participants' overall knowledge and attitude, and perceived risk toward CC (n=1085)

Parameter	No	%
Overall knowledge		
Unsatisfactory	622	57.3
Satisfactory	463	42.7
Overall attitudes		
Negative	441	40.6
Positive	644	59.4
Overall risk perception		
Low	462	42.6
High	623	57.4

Discussion

The current study showed that more than half (57.4%) of the studied women had a high CC risk perception, whereas the rest (42.6%) had low-risk perception. Specifically, around two-fifths of them disagree that they are vulnerable to acquisition of CC either in the future (39.2%), within a few years (45.7%), or at any time during life (46.2%). However, the highest percentage of the participants agreed on the severity of the disease and reported that they were afraid of getting the disease and thought that it could disrupt their marital relationship and their whole life. However, this was not translated into action where most of the studied women did not take any preventive step against CC (almost all had no previous Pap testing or HPV vaccination). The reason is probably attributed to the cultural barriers, especially that most of them were highly educated. A Saudi qualitative study by Jradi and Bawazir[31] uncovered these cultural concerns regarding sexually transmitted infection. It explored that the Saudi women have credence that being a religious and conservative population, deemed them at no risk for such diseases.

Four studies reported similar findings. An Ethiopian study by Getaneh *et al.*[30] appraised the female college students' CC-related knowledge, perceptions and attitudes. More than half (56.8%) of the participants reported being at risk for acquiring CC. Chisale Mabotja *et al.*[32] reported high mean scores for the perceived severity and susceptibility among African women in studying their beliefs and perceptions toward CC and its screening. Russell *et al.*[33] investigated the HPV vaccine acceptability, and risk perception for CC in Africa and showed that more than half (57.0%) of the studied women had moderate-to-high risk perception for HPV and CC. A related study in Riyadh by Aldohaian *et al.*[24] reported a modest women's reporting of susceptibility to CC. The study also depicted higher motivation and perceived benefits of CC and its screening with lower barriers despite having no prior Pap testing or HPV vaccination among most women.

By contrast, an Iranian qualitative study exploring the role of risk perception and knowledge concerning CC and screening by Taghizadeh Asl

Table 4: Binary logistic regression of participants' perceived risk of cervical cancer and associated factors (1085)

Variables	CC risk perception predictors AOR [95%CI]	P-value
Marital status		
Married	Reference	0.695
Divorced	0.855 [0.284 - 2.576]	0.781
Widowed	3.657 [0.156 - 85.780]	0.421
Residence		
Rural	Reference	
Urban	1.132 [0.583- 2.197]	0.714
Education		
Secondary school	Reference	
University or postgraduate	3.105 [1.300 - 7.418]	0.011*
Monthly income		
Not enough	Reference	
Enough	1.787 [0.739 - 4.321]	0.197
Family history of CC		
No	Reference	
Yes	4.498 [1.119 - 18.085]	0.034*
Overall knowledge		
Unsatisfactory	Reference	
Satisfactory	2.304 [1.289 - 4.116]	0.005*
Overall attitudes		
Negative	Reference	
Positive	3.248 [2.532 - 4.166]	0.000*
Age	1.191 [1.043-1.359]	0.010*
Marriage age	0.997 [0.900 - 1.105]	0.956
Marriage duration	3.123 [1.112 - 8.767]	0.031*
Gravidity	1.027 [0.894 - 1.180]	0.710
Parity	0.854 [0.684-1.066]	0.164

et al.[34] revealed an overall low-risk perception for CC with much lower perceived susceptibility and aggravated perception of severity. This figure was mainly attributed to the limited CC knowledge and misconception among study participants. They overestimated the hereditary role in CC incidence and did not distinguish between CC and sexually transmitted infections, especially since most had no family history and no symptoms. Besides, the sociocultural barriers for communicating matters related to CC. Another Saudi study in Al Hassa by Salem *et al.*[35] examined the CC perceived risk and screening barriers**.** It portrayed that only 18.0% of the studied female teachers had above average risk perception to CC, whereas the highest percent had below average (50.0%) or average (32.0%) risk-perception. This figure can be attributed to the poor CC-related knowledge among most participants. A higher figure was portrayed in Uganda by Mukama *et al.*[36], where the highest percent of the respondents perceived their vulnerability to CC (76.0%) and the disease severity (94.6%). This can be attributed to the various background criteria of the studied women in Mukama's study. Most of them were primarily educated (58.9%), rural residents (67.8%), and the culture difference in the first regard.

The current study confirmed numerous significant and positive factors associated with CC risk perception, including the educational level, marriage duration, age, CC family history, knowledge, and attitude. Women with high education and longer marriage duration have a three-times higher probability of having higher CC risk perception. Increasing women's age, nearly double their probability of high-risk perception. Greater than the four-fold probability for increasing CC risk perception was proved for those with positive family history. Evidence also revealed varied associated factors with the women's CC risk perception. First, A Saudi study by Aldohaian *et al*[24] proved that the women's education and CC family history were significantly associated with their belief in higher susceptibility for CC. Second, a Saudi study by Salem *et al*[35] proved that CC risk perception was significantly higher among older (>40) and married women and previous history of CC screening. *Third*, an African study by Opoku *et al*[37] demonstrated that CC risk perception was significantly associated with women's screening willingness and higher education and knowledge about CC.

Distinctly, the risk perception is basically shaped by the individuals' knowledge and attitudinal beliefs, which provide internal power and base for rational evaluation of their risk level. Aldohaian *et al*[24]**,** Annan *et al*[38]**,** Salem *et al*[35], Opoku *et al*[37]. The present study portrayed that having a satisfactory knowledge doubled the probability of having higher CC risk perception, where 42.7% of the studied women have satisfactory CC-related knowledge levels, and 57.3% of them had unsatisfactory levels. This explains why more than half of the study

participants had a higher risk perception for cervical cancer. In unity, Annan *et al*[38], in an analysis of the mediating influence of the perceived CC seriousness on its related knowledge and screening behaviors, confirmed that increased CC knowledge was significantly related to increased perceived susceptibility and seriousness of CC and the perceived benefits of CC screening behaviors. Moreover, Salem *et al*[35] and Opoku *et al*[37] confirmed that those with higher knowledge scores about CC and its risk factors have higher risk perception.

Three studies declared a similar trend for unsatisfactory CC-related knowledge. *First,* a recent Saudi study (in Al Madinah Province) by Zahid *et al*[39] reported a low-to-moderate CC knowledge concerning its symptoms and prevention. *Second*, a systematic review in India by Taneja *et al*[40] concluded a fair knowledge toward CC and its screening among Indian women; however, a gap was also present in its transformation into practice. Third, AlHarfi *et al*[41] found that the studied Saudi women had a basic knowledge about CC, but 31.8% had an idea about HPV as a risk factor for CC while only 21.1% had prior knowledge about the HPV vaccine and Pap testing. In contrast, a higher figure was portrayed by two Ethiopian studies, which revealed that the highest percent of the participants had either good (59.3%) Getaneh *et al*[30] or adequate (55.7%) *Wakwoya et al*[28] knowledge about CC and its screening. This may be attributed to the cultural variation between countries that open or close the discussion or communication about such sexual-related issues and the held personal attitude toward such issues.

The current study confirmed that those who had a positive CC-related attitude had a three-folded probability of increasing risk perception where 59.4% of the participants had a positive attitude and the rest (40.6%) had a negative attitude. This may be related to the higher level of education among the highest percentage of them, which also justifies the higher risk perception among more than half of them. Similarly, Getaneh *et al*[30] depicted a favorable attitude among the highest percent of the respondents (67.7%), whereas the rest (32.3%) of them had an unfavorable attitude towards CC and its screening. A Saudi study conducted in Makka by-Alfalogy *et al*[42] portrayed a positive attitude towards CC screening and HPV vaccination among most studied women despite the prevailing poor knowledge about CC and its risk factors. This uncovered the essential role of women's attitude in shaping their subsequent health behavior for CC prevention based on evaluating and perceiving its severity.

On the contrary, a Saudi study by Alnafisah *et al*[43] reported a negative attitude toward CC and its preventive measures among the highest percent of the studied women in the Qassim region. Moreover, a Turkish study by Yanikkerem *et al*[44] portrayed negative CC-related beliefs and attitudes with low health motivation levels among most studied women. This is mainly due to this contradictory study's prevailing deficient knowledge and lower educational levels. Besides, the reported cultural barriers to discussing sexual-related issues with the health care providers and high perceived barriers, especially among women belonging to a low socioeconomic group.

Conclusion

The current study portrayed a higher risk perception regarding cervical cancer among more than half of the Saudi women in Najran city. Moreover, more than half had a positive cervical cancer-related attitude but unsatisfactory knowledge about its risk factors, symptoms, and screening. Women with higher education levels and longer marriage duration have a three-time higher probability for higher risk perception. Increasing women's age, nearly double their probability of high-risk perception. Positive family history for cancer/CC increases the probability for higher CC risk perception by more than four-fold. Besides, women with satisfactory knowledge have more than double the probability of having higher risk perception. More than three-folded probability for the higher risk perception was associated with having a positive attitude toward it.

Recommendations

Based on the findings as mentioned earlier, it is recommended to**:**

Develop targeted health education programs for women to enrich their knowledge about cervical

cancer and its symptoms, risk factors, and screening recommendations.

- Social-mass-media-based campaigns to foster the women's risk perception about cervical cancer
- Enacting awareness-raising programs through the ministry of health to cut down the culture of silence surrounding the sexual-related issues in Saudi Arabia.

Ethical consideration

Ethical approval to conduct the study was obtained from the Deanship of Scientific Research at the University of Najran (NU/RG/MRC/11/1). Informed consent was taken from each participant before proceeding to the questionnaire, with an adequate explanation of the study purpose on the front page of the questionnaire. They were informed that their information was confidential and used only for research purposes, and anonymity of the data was assured. Participants were also informed that their participation is inherently voluntary, and they can cancel their sheets at any step.

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.

Competing interests

The authors declare they have no conflict of interest.

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. *Alshahrani*- Drafting the article or revising it critically for important intellectual content, final approval of the version to be submitted. *Al-Thubaity*- 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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