

## ORIGINAL RESEARCH ARTICLE

# Intention and self-efficacy for pap smear screening and Human Papilloma Virus vaccination among Saudi women at Najran city, KSA

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## Abstract

Exploring the women's intention of the core self-directed behaviors for cervical cancer prevention and their confident abilities for engagement is of utmost importance for targeted intervention development. This study investigates the Saudi women's intention and self-efficacy for Pap Smear Screening and HPV Vaccination in Najran city, KSA. It was a descriptive cross-sectional study incorporating a convenient sample of 1085 Saudi women through a social media-based four-part questionnaire: Basic Data and Reproductive Health History, Pap Smear Intention Scale, HPV vaccination intention scale, Self-Efficacy Scale for Pap smear testing, and HPV vaccination. The results indicated that 59.5% of the study participants had a low intention for Pap testing, while 62.5% of them had a high intention to receive the HPV vaccine, and the self-efficacy for both was high among 57.0% of them. Binary logistic regression showed higher odds for Pap testing intention among older women with enough family income and those with no history of Pap testing and higher gravidity and parity. Rural resident women and those having no family history of CC have Lower odds for HPV vaccination intention. Women of reproductive age and those with high gravidity and parity have higher odds. Self-efficacy has lower odds among divorced, rural resident women and those with no history of Pap testing or HPV vaccine; however, women with longer marriage duration and higher gravidity and parity had higher odds. Hence, there is an apparent high intention for HPV vaccination with a low intention for Pap testing among Saudi women in Najran despite having a higher self-efficacy. These necessitate establishing consolidated efforts for awareness-raising and advocacy programs to prevent CC. (*Afr J Reprod Health* 2022; 26[7s]: 61-73).

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**Keywords:** Cervical cancer, intention, self-efficacy, pap smear, HPV vaccine

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## Résumé

Explorer l'intention des femmes concernant les comportements autodirigés de base pour la prévention du cancer du col de l'utérus et leurs capacités confiantes d'engagement est de la plus haute importance pour le développement d'interventions ciblées. Cette étude examine l'intention et l'auto-efficacité des femmes saoudiennes pour le dépistage par frottis de Pap et la vaccination contre le VPH dans la ville de Najran, en Arabie saoudite. Il s'agissait d'une étude transversale descriptive incorporant un échantillon pratique de 1085 femmes saoudiennes par le biais d'un questionnaire en quatre parties basé sur les médias sociaux: données de base et antécédents de santé reproductive, échelle d'intention de frottis Pap, échelle d'intention de vaccination contre le VPH, échelle d'auto-efficacité pour Pap les tests de frottis et la vaccination contre le VPH. Les résultats ont indiqué que 59,5 % des participants à l'étude avaient une faible intention de subir un test Pap, tandis que 62,5 % d'entre eux avaient une forte intention de recevoir le vaccin contre le VPH, et l'auto-efficacité pour les deux était élevée chez 57,0 % d'entre eux. La régression logistique binaire a montré des probabilités plus élevées d'intention de test Pap chez les femmes âgées ayant un revenu familial suffisant et celles sans antécédents de test Pap et ayant une gravidité et une parité plus élevées. Les femmes qui résident en milieu rural et celles qui n'ont pas d'antécédents familiaux de CC ont des probabilités plus faibles d'avoir l'intention de se faire vacciner contre le VPH. Les femmes en âge de procréer et celles dont la gravidité et la parité sont élevées ont des chances plus élevées. L'auto-efficacité a des probabilités plus faibles chez les femmes divorcées résidant en milieu rural et chez celles qui n'ont pas d'antécédents de test Pap ou de vaccin contre le VPH; cependant, les femmes avec une durée de mariage plus longue et une gravidité et une parité plus élevées avaient des chances plus élevées. Par conséquent, il y a une intention élevée apparente pour la vaccination contre le VPH avec une

faible intention pour le test Pap chez les femmes saoudiennes à Najran malgré une auto-efficacité plus élevée. Celles-ci nécessitent la mise en place d'efforts consolidés pour des programmes de sensibilisation et de plaidoyer afin de prévenir le CC. (*Afr J Reprod Health* 2022; 26[7s]: 61-73).

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**Mots-clés:** Cancer du col de l'utérus, intention, auto-efficacité, test de pap, vaccin contre le VPH

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## Introduction

Cervical Cancer (CC) is an overarching public health problem that roughly every woman (aged at least 30 years) is vulnerable to CC. It is the highest frequent reproductive system cancer with associated mortality. Globally in 2020, the World Health Organization (WHO) appraised CC as the fourth most highly frequent type of cancer, with 604.000 incident cases and 342.000 deaths. Specifically, the low- and average-income countries had the most cases (90%) and related deaths. Approximately all CC cases (99%) were attributed to a sexually transmitted infection with the Human Papillomavirus (HPV). It is a shared infection in both sexes who are sexually active; they may get HPV infection once in their lives or might be infected recurrently. Even though HPV is a mostly asymptomatic and self-limited infection, if it persists for a long time, this increases the risk for the progression of precancerous lesions to invasive CC among women. Nearly half of CC cases are attached to two major HPV species (HPV-16 and 18)<sup>1-3</sup>.

Saudi Arabia's information center on Human Papillomavirus (HPV) and cancer by the end of 2021 highlighted that CC is the eighth most frequently encountered cancer and the seventh leading cause of death among Saudi women. It also confirmed that all Saudi women aged 15 years or more (10.3 million) are at risk for CC, with 358 annual incidence cases and 179 deaths. HPV-linked data is limited in Saudi Arabia, but in the Asian region, nearly 2.5% of reproductive-age women were infected with HPV-16 and 18 at a given time. In addition, overall, 72.4% of the invasive CC cases are attributed to both types of HPV<sup>4</sup>.

Evidence showed many other risk factors for CC, such as smoking, early marriage (before 18 years), high parity number, and having many sexual partners. The latter is common in Saudi culture and the Islamic religion, legitimizing multiple marriages for men. In this way, he can transmit the infection to his wives. A recent case-control study in 2019 by Kashyap *et al.* added other risk factors for CC where it showed high odds for CC among

women with a history of genital warts, sexually transmitted infection, poor menstrual hygienic practices, low education, rural residence, and lack of a health services accessibility. Once diagnosed, the early stage of CC is generally asymptomatic; however, the more-advanced cases usually complain of vaginal bleeding (post sexual intercourse or during the menstrual cycle or after menopause), foul odor vaginal discharge (watery or bloody), and pelvic pain or painful sex<sup>3,5</sup>.

Fortunately, CC is the most preventable and curable type of cancer through an inclusive and multidisciplinary approach throughout the women's life course. This approach was recommended in 2020 by the World Health Assembly as a global strategy to eliminate CC. Aside from the importance of health education about its risk factors among the growing girls and women either at a health facility, school, or community level, vaccination and screening have a chief role in CC prevention. The Papanicolaou smear (Pap smear) screening tool can discover cervical cytological abnormalities<sup>3,6</sup>. The United States Preventive Services Task Force (USPSTF) recommends Pap smear screening every three years for women (21-65 years). For those aged 30-65 years, both (Pap smear and HPV tests) should be carried out every five years<sup>7</sup>. The HPV vaccine proved to protect against the main evident cause of CC. The WHO recommends this vaccine for girls (9 -14 years) before initiating sexual activity<sup>6</sup>.

In Saudi Arabia, there is no universal CC screening program which can probably explain why 43.0% of cases are diagnosed at late stages (III and IV) compared to a lower trend (25.0%) in British Columbia, which has an operative program for CC screening. Besides, the low awareness and compliance with CC screening recommendations and the limited availability of HPV immunization in Saudi Arabia for those aged 9 to 26 years. However, it is recently added to the immunization schedule of girls and boys (9-12 years old). These can aid in the future elimination of cases of both CC and penile cancer<sup>8-10</sup>.

Thus, the core of CC prevention is the prevention and early detection through screening

and HPV vaccination which merely rely on the women's active participation and self-motivation to engage in such preventive health behaviors<sup>4,10</sup>. In this regard, the role of intention and self-efficacy was enlightened, which have proved as the prime theoretical constructs in forecasting health behaviors. Distinctly, many theoretical perspectives have explained the important role of the intention in screening behaviors coupled with an individual's self-efficacy to foster the change of this intention to actual behavior, such as the social cognitive theory, health belief model, theory of reasoned action which extended to a theory of planned behavior, and the integrated behavioral model<sup>11-13</sup>.

The intention is considered the culmination of the individual's decision-making process. It signals the end up of the individual's self-deliberation about certain behavior. It captures the self-developed performance standard, the commitment to this standard, and the devoted time and effort for this action<sup>14</sup>. Given the centrality of the intention construct to several health behavior models, it can be affected by various social, economic, cultural, and personal factors. One of the most influencing personal forces on the intention is the individual self-efficacy<sup>13</sup>. It explores the individual's perceived confidence in his ability for successful behavioral conduction besides the ability to control the probable faced personal or environmental barriers. Recent evidence indicates that various complex sociodemographic, cultural, and personal factors may influence the women's decision-making process for engaging in CC screening and vaccination by influencing their attitudes, intention, and self-efficacy. This is mainly evident through the discovered considerably overall low rate of CC screening service utilization that is varied between countries by many recent studies<sup>15-17</sup>. Thus, the present study intended to investigate Saudi women's intention and self-efficacy for Pap Smear Screening and HPV Vaccination and their associated factors in Najran city, KSA.

## Methods

### Research questions

- What are the intention levels for Pap smear screening and HPV vaccinations among Saudi women in Najran city?

Intention and self-efficacy for pap smear screening

- What is the level of self-efficacy for Pap testing and HPV vaccinations among Saudi women in Najran city?
- What are the associated factors with the self-efficacy and intention for Pap testing and HPV vaccinations?

### Study design and setting

This descriptive cross-sectional research study was accomplished in Najran city, KSA, as the biggest city in the Najran region with a great number of women (20-60 years), representing one-half of the total females and nearly one-quarter of the total population in the region<sup>18</sup>.

### Study respondents and sample size estimation

A convenient sample of 1085 Saudi women was enrolled who were Saudi women (>18 years), resided in Najran city, able to read and write, mentally alert, and welcomed the participation in the study. The data was compiled using a social media-based survey created using the Survey Monkey program. A link was created and shared via various social media platforms such as Twitter, Telegram, Facebook, WhatsApp, and Instagram.

The sample size was estimated using the Epi-info sample size calculator based on these parameters: total population size = 136090; anticipated frequency (50%), a margin of error (5%), and 95.0% confidence interval. A minimum required sample size of 1075 participants has resulted. Finally, 1150 women have been included in the study to compensate for possible exclusion due to incongruence with inclusion criteria.

### Questionnaire development

It encompassed four parts as follows:

- Basic Data and Reproductive Health History: age, residence, education, family history of cancer, existing contraceptives use, history of HPV vaccine or Pap smear, marriage age and duration, gravidity, parity, and self-reported family income as enough or not enough.
- Pap Smear Intention Scale: the investigators developed it after reviewing the related literature. The women were asked about their

future Pap testing intentions using four items on five-point Likert scales from (1) extremely likely to (5) extremely unlikely. The composite score (5-20) was categorized as low (<60%), and high (> 60%) intention<sup>19,20</sup>.

- The investigators designed the HPV vaccination intention scale after reviewing the relevant literature. The authors inquired the women to rate their future HPV vaccination intention using five statements on a 5-point-Likert scale from (1) extremely unlikely to (5) extremely likely. The total score was calculated by summing items and ranged from (5-25). The women were considered to have low (1-15) and high (16-25) intentions based on their total score<sup>21</sup>.
- Self-Efficacy Scale for Pap Smear testing and HPV vaccination: it was adopted from Stout *et al.*, (2020)<sup>22</sup> and Fernandez *et al.*, (2009)<sup>23</sup>, where women were asked to rate their sureness in their ability to perform Pap testing (8 items) or HPV vaccination (3 items). It was translated into the Arabic language by the investigators. A three-point Likert scale was used (1=unsure, 2=undecided, 3= sure). The total score (11-33) was calculated by summing items and leveled into low (11-22) and high (23-33) self-efficacy based on the women's scores.

### **Questionnaire validity and reliability**

The instrument was examined for its content, face, and construct validity by six experts in the field as a jury. It exhibited a good Content Validity Index (CVI=0.85) for items relevance. The investigator executed the proposed modifications to confirm the content's ease, relevance, and coherence. Reliability was guaranteed by the Alpha Cronbach test that proved homogeneity of the items for all scales with a satisfactory internal consistency score: Pap smear intention ( $\alpha=0.85$ ), HPV vaccination intention ( $\alpha=0.80$ ), and self-efficacy ( $\alpha=0.86$ ).

### **Pilot study**

It was performed on 100 Saudi women (not incorporated in the study sample) to assure the questionnaire's clarity, easiness, and applicability. The required minor modifications were accomplished to finalize the questionnaire.

### **Data collection**

The weblink of the questionnaire was released on a variety of social media platforms (Twitter, Facebook, WhatsApp, Telegram, and Instagram). The data was collected over nearly four months (from October 2021 till the end of January 2022). The average filling time for the questionnaire, as recorded by Survey Monkey, was 10-15 minutes.

### **Data analysis**

The Statistical Package for Social Science [SPSS] version 23 (IBM Corp., Armonk, N.Y., USA) was deployed for data analysis. The authors summarized the study variables using frequency, Percent, Arithmetic Mean, and Standard Deviation. Binary logistic regression was utilized to assess the odds of correlation with intention and self-efficacy. An adjusted odds ratio (AOR) with 95% confidence intervals (CI) and a P-value of less than 0.05 were deemed to have a statistical significance of association with women's intention and self-efficacy.

## **Results**

Table 1 shows that most of the study participants were married (91.7%) and urban residents (93.9%). Besides, 65.3% of the study participants are highly educated, and 85.7% reported enough monthly income. History of gynecologic operation, genital infection, contraceptive use, and family history of cervical cancer were reported by 17.9%, 47.6%, 74.6%, and 3.3% of the study participants, respectively. Almost all the study participants did not receive the HPV vaccine (99.0%) or the Pap smear test (98.0%). The table also shows the means of the study participants' age (37.79), age at marriage (23.03), marriage duration (15.17), gravidity (4.34), and parity (3.59).

Table 2 reveals that 38.3% of the study participants can discuss Pap smears with their healthcare providers, and 43.9% are sure they can stick to pap smear appointments. Besides, 34.2% are sure that they can keep having a Pap test even if they go to a new health office, and 43.0% can ask for a referral for Pap testing from their primary healthcare providers. Self-efficacy related to the continuity of regular Pap testing, even if it would be

**Table 1:** Participants' basic data and reproductive health history (n= 1085)

<b>Basic data</b>	<b>N (1085)</b>	<b>%</b>
<b>Marital status</b>		
Married	995	91.7
Divorced	68	6.3
Widow	22	2.0
<b>Residence</b>		
Rural	66	6.1
Urban	1019	93.9
<b>Education</b>		
Secondary education	377	34.7
University/ postgraduate	708	65.3
<b>Self-reported monthly income</b>		
Not enough	155	14.3
Enough	930	85.7
<b>History of gynecologic operations</b>		
Yes	194	17.9
No	891	82.1
<b>History of genital infection</b>		
Yes	517	47.6
No	568	52.4
<b>History of contraceptive use</b>		
Yes	809	74.6
No	276	25.4
<b>Family history of cervical cancer</b>		
Yes	36	3.3
No	1049	96.7
<b>History of HPV vaccination</b>		
Yes	11	1.0
No	1074	99.0
<b>History of Pap smear screening</b>		
Yes	22	2.0
No	1063	98.0
<b>Mean age in years (SD)</b>	37.79(7.41)	
<b>Marriage age mean in years (SD)</b>	23.03(4.95)	
<b>Marriage duration mean in years (SD)</b>	15.17(9.73)	
<b>Gravidity mean (SD)</b>	4.34(2.89)	
<b>Parity means (SD)</b>	3.59(2.35)	

painful, was assured by 40.5% and 38.6, respectively. In addition, 43.8% are sure they will perform a Pap smear even if friends discourage them, and 46.5% are ready to pay for it. Regarding the HPV vaccination, the study participants are sure that they will get HPV vaccination even if it is expensive (46.0%) or the shot hurts a little (44.0%), and 38.7% of them are sure that they can find time for vaccine appointments.

Figure 1 illustrates that 59.5% of the study participants have a low intention for Pap smear screening compared to a high intention for HPV

vaccination among 62.5% of them. Self-efficacy for Pap testing and HPV vaccination was high among 57.0% of the study participants.

Table 3 shows that age, monthly income, history of Pap smear screening, gravidity, and parity can predict women's Pap smear screening intention. Older women with enough family income have a higher probability of performing a Pap smear test when taking a young woman with little monthly income as a reference [AOR=1.499(1.101-2.041), P=0.010], and [AOR=1.669(1.090-2.557), P=0.018], respectively. Having no history of Pap smear tests increases the probability of future screening compared with women with previous Pap smear results. [AOR=0.287(0.049- 0.984), P=0.038]. High gravidity and parity increase the probability of performing Pap smear screening compared to nulligravida and nulliparous women [AOR=1.745(1.054-2.890), P=0.030], [AOR =2.620 (1.061-6.469), P=0.037], respectively.

Residence, family history of CC, age at marriage, gravidity, and parity are positively associated with HPV vaccination intention. Being rural resident and having no family history of CC have lower intention to receive HPV [AOR=0.536(0.307-0.936), P=0.028], [AOR=0.689(0.374-0.972), P=0.002]. The positive predictors for HPV vaccination intention are high gravidity [AOR=5.812(1.965-12.233), P=0.019], parity [AOR=4.812(1.635-14.163), P=0.004], and being in reproductive age [AOR=1.322(0.979-1.791), P=0.039].

The significant predictors for high self-efficacy are marital status, residence, history of Pap smear/HPV, marriage duration, gravidity, and parity (p<0.05). Being divorced decreases the probability of having high self-efficacy when taking a married woman as a reference [AOR=0.575 (0.333-0.993), P=0.047]. Besides, rural residents have a lower probability of having high self-efficacy when compared to urban residents [AOR=0.489(0.274-0.872), P=0.015]. Having no history of Pap testing or HPV vaccine decreased the chance of high self-efficacy [AOR=0.187(0.039- 0.884), P=0.034]. Longer marriage duration increased the probability of having higher self-efficacy [AOR=2.309(1.421-3.751), P=0.001]. Increasing the gravidity and parity numbers are positive predictors of high self-

**Table 2:** Self-Efficacy of Pap Smear screening and HPV Vaccination among the study participants

Questions: How sure are you that you can.....?	Sure No(%)	Undecided No(%)	Unsure No(%)
<b>Pap Smear Self-Efficacy</b>			
Discuss having a Pap test with your healthcare provider even if (s)he does not bring it up?	416(38.3)	513(47.3)	156(14.4)
Schedule a Pap test appointment and keep it?	476(43.9)	409(37.7)	200(18.4)
Keep having a Pap test even if you had to go to a new office to get one?	371(34.2)	450(41.5)	264(24.3)
Ask your primary care physician for a referral to get a Pap test?	466(43.0)	388(35.8)	231(21.2)
Go to get your next Pap test?	440(40.5)	396(36.5)	249(23.0)
Get a Pap test even if you are worried that it will be painful?	418(38.6)	438(40.4)	229(21.1)
Get a Pap test even if a friend discouraged you from having one?	475(43.8)	410(37.8)	200(18.4)
Get a Pap test even if you had to pay for it?	505(46.5)	381(35.2)	199(18.3)
<b>HPV vaccination Self-Efficacy</b>			
Get the HPV if it is expensive	499(46.0)	386(35.6)	200 (18.4)
Getting the shot, even if it hurts a little	477(44.0)	410(37.8)	198 (18.2)
Find time to go to the doctor many times.	420(38.7)	440(40.6)	225(20.7)

efficacy [AOR=2.874(1.241-6.653), P=0.014], and [AOR=2.672(1.331-6.897), P=0.030], respectively.

## Discussion

The overall findings of the present study explored a low intention for Pap smear screening compared to a high intention for HPV vaccination with a higher self-efficacy level among the studied women. The Pap testing intention was positively predicted by the increased women's age, having enough monthly income, previous Pap testing, and high gravidity and parity. The HPV vaccination intention was positively predicted by women's rural residence and having no family history of CC, whereas it was positively predicted with high gravidity and parity. Moreover, being divorced and a rural resident and having no history of Pap testing/HPV vaccination were negative predictors of self-efficacy. However, longer marriage duration and an increased number of gravidities and parities were the positive predictors of self-efficacy level.

The current study portrayed that more than half of the studied women have a low intention for Pap testing. A higher probability of pap testing was seen among older women, those with enough family income, no previous Pap smear test, and high gravidity& parity. These reflect that older women who had many pregnancies and deliveries may perceive that they were at more risk for CC, especially if they had not performed it before and could afford it. It is worth mentioning that although most of the studied women were highly educated, there is low intention to perform pap smear testing. These may be attributed to the free history of a

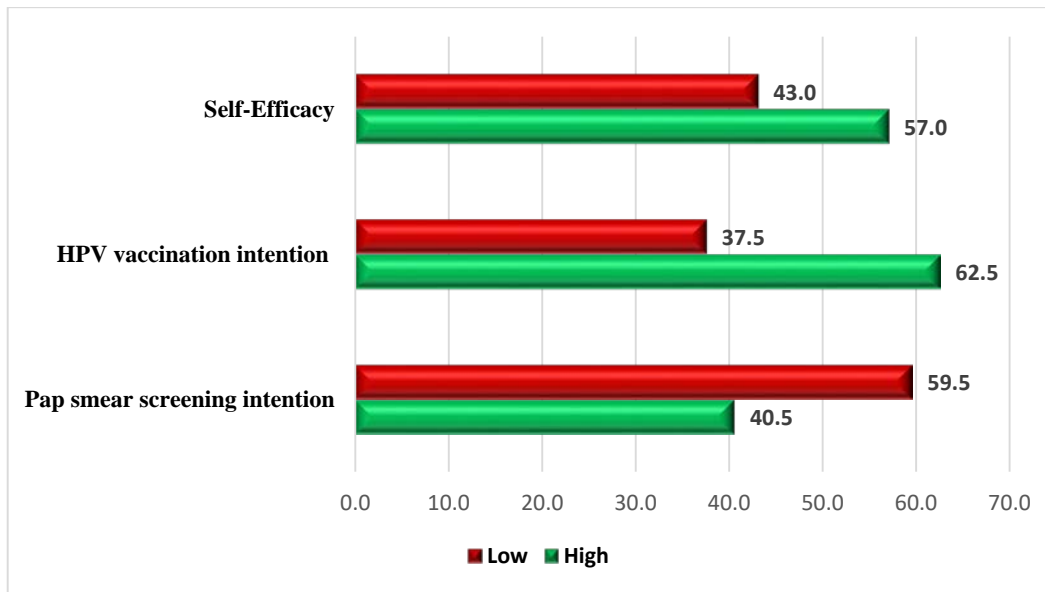
genital infection (82.1%), gynecological operation (52.4%), and family history of CC (96.7%) among most of the studied women, which may give them a sense of being at low risk. These reflect the cultural background's influence, which was also explored by a qualitative study by Jradi and Bawazir<sup>24</sup>, which gave an in-depth elaboration of the cultural concerns about screening and vaccination for classical sexually transmitted infection. In addition to the inadequate perception of CC screening as necessary, asymptomatic women deemed themselves not at risk. They believed that being a religious and conservative group is already at lower risk for such diseases.

Three recent Studies proved a lower trend for Pap testing intention. First, a Saudi study by Alissa<sup>25</sup> examined Pap smear testing's knowledge and intentions, signifying near average intention for Pap testing. Besides, age and marital status were the determinants of such intention. Second, an Ethiopian mixed study by Getahun *et al.*<sup>26</sup> investigated CC screening and revealed a low intention among nearly half of the studied women, mainly due to cultural constraints. It explored a fixed thought among women that this procedure can hit the cervix and perforate the uterus, resulting in infertility; they also fear being misunderstood by their community due to seeking CC screening services. Third, Alnafisah *et al.*<sup>27</sup> assessed the women's knowledge and attitude toward CC screening in the Qassim region, proving that more than two-fifths of the studied women completely refused to attend it in the future, which explored a negative attitude toward it. However, they agreed

**Table 3:** Binary logistic regression analysis of the associated factors with the intention and self-efficacy of the Pap smear screening and HPV Vaccination

	Pap smear screening intention		HPV vaccine intention		Self-efficacy	
	AOR (95% CI)	p	AOR (95% CI)	p	AOR (95% CI)	p
<b>Age</b>						
<35year	Ref					
>35 years	1.499(1.101-2.041)	0.010*	1.387(0.965-1.994)	0.078	0.969(0.674-1.394)	0.867
<b>Education</b>						
Secondary school	Ref					
University or postgraduate	0.823(0.618-1.096)	0.183	0.776(0.597-1.009)	0.059	0.829(0.629-1.091)	0.181
<b>Marital status</b>		0.441		0.590		0.119
Married	Ref					
Divorced	1.405(0.786-2.514)	0.252	1.302(0.774-2.188)	0.320	0.575(0.333-0.993)	0.047*
Widow	1.338(0.525-3.407)	0.542	0.910(0.372-2.227)	0.837	1.238(0.517-2.965)	0.631
<b>Residence</b>						
Urban	Ref					
Rural	0.778(0.437-1.385)	0.394	0.536(0.307-0.936)	0.028*	0.489(0.274-0.872)	0.015*
<b>Self-reported Monthly income</b>						
Not enough	Ref					
Enough	1.669(1.090-2.557)	0.018*	1.121(0.775-1.623)	0.543	0.929(0.633-1.364)	0.708
<b>History of contraceptive use</b>						
Yes	Ref					
No	0.878(0.633-1.218)	0.436	0.945(0.695-1.285)	0.719	0.955(0.691-1.319)	0.779
<b>Family history of cervical cancer</b>						
Yes	Ref					
No	0.902(0.670-1.215)	0.499	0.689(0.374-0.972)	0.002*	0.868(0.653- 1.155)	0.332
<b>History of pap smear or HPV Vaccine</b>						
Yes	Ref					
No	0.287(0.049- 0.984)	0.038*	2.994(0.634-14.140)	0.166	0.187(0.039- 0.884)	0.034*
<b>Age at marriage</b>		0.738		0.039*		0.385
<20year	Ref					
20-30	0.913(0.687-1.213)	0.529	1.322(0.979-1.791)	0.072	0.891(0.663-1.197)	0.444
>30 years	1.063(0.594-1.903)	0.837	0.730(0.375-1.422)	0.355	1.260(0.675-2.349)	0.468
<b>Marriage duration</b>		0.031		0.047*		0.002*
<10year	Ref					
10-20	0.673(400-1.133)	0.137	.715(0.490-1.043)	0.081	1.750(1.198-2.558)	0.004*
>20	1.134(0.773-1.662)	0.520	1.012(0.631-1.625)	0.959	2.309(1.421-3.751)	0.001*
<b>Gravidity</b>		0.075		0.008*		0.044*
0	Ref					
1-4	1.395(0.876-2.223)	0.161	3.952(1.936-11.390)	0.003*	2.874(1.241-6.653)	0.014*
>4	1.745(1.054-2.890)	0.030*	5.812(1.965-12.233)	0.019*	2.468(0.997-6.107)	0.050*
<b>Parity</b>		0.079		0.012*		0.024*
0	Ref					
1-4	2.620(1.061-6.469)	0.037*	4.552(1.646-12.590)	0.004*	2.672(1.331-6.897)	0.030*
>4	1.616(0.956-2.731)	0.073	4.812(1.635-14.163)	0.004*	2.201(0.997-6.785)	0.007*

AOR: Adjusted Odd Ratio CI: confidence Interval \*significant at p&lt;0.05



**Figure 1:** Participants' total scores of intentions and self-efficacy for Pap Smear testing and HPV vaccination

that a Pap smear was necessary and agreed to vaccinate their daughters. The author attributed this to cultural traditions in the region.

Two recent studies portrayed a higher figure. First, Sumarmi *et al.*<sup>17</sup>, who analyzed the factors associated with Pap testing intention in Indonesia, depicted higher intention among the highest percent (60%) of the studied women. Second, Alemnew *et al.*<sup>19</sup>, who investigated the Ethiopian women's intention for CC screening, portrayed that more than half had an above-average intention for Pap smear. This discrepancy may be attributed to the cultural and religious variations where many ethnic groups were incorporated in the latter study. Moreover, previous screening experience was proved by both studies as a significant predictor of Pap testing intention. The former study added other intention predictors, including income and educational levels and having a friend or family with a history of CC. Moreover, age, residence, marital status, educational level, and employment status were significant predictors of Pap testing among Saudi women (> 18 years) residing in Al Madinah Province by Zahid *et al.*<sup>28</sup>. Moreover, a Turkish study by Yanikkerem *et al.*<sup>29</sup> added that pap testing was higher in married, older women and those who had adequate income and had children than the nulliparous women.

The present study demonstrated that nearly two-thirds of the studied Saudi women had high intentions for HPV vaccination. A lower probability of HPV vaccination intention was found among rural women and those with no family history of CC. These might reflect that; rural women may be inadequately informed or lack access to health services, while those with a free family history of CC might perceive that they are at low risk and no need to get the vaccine. In contrast, a higher probability of HPV vaccination intention was revealed among women of reproductive age and those with a high number of gravidity and parity, which may indicate their perception of the risk associated with being unvaccinated. Overall, this might mirror the awareness of Saudi women about the importance of the HPV vaccine and project better coverage by the promised HPV immunization program in Saudi Arabia. Four recent studies go in line with these findings. Kim *et al.*<sup>30</sup> revealed a high mean score for HPV vaccination intention among Korean and Chinese women with no significant difference. A Chinese study by Xu *et al.*<sup>27</sup> and two Saudi studies by Akkour *et al.*<sup>32</sup> and Hussain *et al.*<sup>33</sup> depicted that the highest percent of the participants reported their willingness to receive the HPV vaccine, which investigated the awareness, attitudes, and perception toward the

HPV vaccine. Despite this willingness, worry, and uncertainty about HPV vaccine side effects, effectiveness, availability, and cost were prevalent in all studies. Evidently, Jradi and Bawazir<sup>24</sup> and Akkour *et al.*<sup>32</sup> revealed that Saudi women were less familiar with this novel vaccine. The latter indicated their willingness to be vaccinated, given that being informed about it. Both highlighted that this might be a barrier to the success of the HPV vaccination program, coupled with the cultural restrictions on CC screening practices. These concerns shed light on the pressing need and consolidated awareness-raising and advocacy programs efforts.

A far lower intention level was reported by Zhang *et al.*<sup>34</sup>, who analyzed the HPV vaccination uptake among Chinese university students, where nearly one-third of them were willing to take it. This contrasting figure may be related to the lower mean age of the participants in this contradictory study than the present one (18.99 vs. 37.79 years). Conversely, a far higher intention level was detected by Wijayanti<sup>35</sup>, who reported that most of the studied parents had a strong intention to vaccinate their daughters. These may be attributed to the parent's concern for their daughters' health, plus that the Indonesian government has an effectively established HPV vaccination program since 2016 for girls (5–6 years). The determinants of receiving HPV vaccination are varied among women by culture and country (with or without CC prevention program). The significant predictors reported in recent literature for HPV vaccination intention include having a family member and friend with cancer (Si *et al.*<sup>35</sup>), residence, and knowledge about CC and HPV vaccine (Le *et al.*<sup>36</sup>). In addition, Zhang *et al.*<sup>37</sup> mentioned that being married, urban residents and reception to HPV vaccination counseling were also significant predictors.

The current study portrayed that more than half of the studied women had high self-efficacy for Pap testing and HPV vaccination. A lower probability for self-efficacy was found among divorced and rural women and those with no history of Pap smear tests or HPV vaccine. However, a higher probability was detected among women with longer marriage duration and high among

those having higher parities and gravidities. These reflect that having children and family responsibilities may act as a pushing force that boosts women's belief in their abilities to protect their health for the sake of their families. In addition, women's perception of the risk associated with repeated pregnancies, deliveries, and regular sexual intercourse for CC may be the other pushing force to do so. Evidently, Christy *et al.*<sup>38</sup> confirmed the mediating effect of self-efficacy for the relationships between the barriers' perception of HPV vaccination, the risk associated if not being vaccinated, and the final vaccination decision. Moreover, Khodadadi *et al.*<sup>39</sup>, in examining the Latinx mothers' intention and perceived self-efficacy for HPV vaccination, proved that those who have lower self-efficacy have higher hesitancy for HPV vaccination.

Convenient findings were shown by Chisale Mabotja *et al.*<sup>40</sup>, who revealed high self-efficacy for Pap testing among African women and proved that age was a significant positive predictor of self-efficacy. They studied women's beliefs and perceptions regarding CC and Pap testing. An Ethiopian study by Wollancho *et al.*<sup>16</sup> investigated Pap testing intention and predictors. It showed good self-efficacy among the participants. At the same time, a small percentage of them expressed concern regarding lack of control due to the time consumed in doing the procedure while being the main caregiver for the family. A Saudi study assessed women's knowledge and self-efficacy for CC screening by Ibrahim<sup>41</sup> showed a moderate (55.8%) to high (40.4%) self-efficacy among the highest percent of the participants for Pap testing. A Korean study by Bossard and Song<sup>42</sup> showed a high level of self-efficacy for HPV vaccination which was insignificantly varied by age, education, income, and the number of children. This insignificance may be attributed to the higher mean age of the women in this contradictory study (53.8) compared to 37.7 years in the present study, plus the culture and religious variation. Moreover, the history of Pap testing was proved as a significant predictor of high-self efficacy by Higgins *et al.*<sup>43</sup>, who examined the intention and self-efficacy for Pap testing among adolescents in the USA.

## Strength and limitations of the study

The study explored well the intention and self-efficacy for a sensitive topic in the Saudi culture, which is not adequately touched on in the literature. It also determined their predictors, which can further aid in developing a targeted intervention. The limitation of the current study is devoted to the designated sampling technique based on the social media survey, which allows only the inclusion of educated women who have access to an internet network.

## Ethical considerations

The investigators have obtained the Ethical approval for this study from the Nursing College, Najran University (NU/RG/MRC/11/1). The studied women get the questionnaire's link with adequate clarification of the study's title and purpose with instructions for answering. Informed online consent was gained from all the respondents before proceeding to the main questionnaire. Women were also assured concerning their responses anonymity and confidentiality and that they were solely used to serve the study's purpose. Women are also informed about the inherent voluntary participation, where they can decline their answers and withdraw at any time.

## Conclusion

The present study concluded that the Saudi women in Najran city had an overall low intention for Pap smear screening. In contrast, they had a high intention for HPV vaccination and a higher self-efficacy level. The significant positive predictors of Pap testing intention were increasing women's age, enough monthly income, previous Pap testing, and high gravidity and parity. The women's rural residence and having no family history of CC were negative predictors of the HPV vaccination intention, whereas high gravidity and parity were the positive predictors. Moreover, being divorced and a rural resident and having no history of Pap testing or HPV vaccination were negative predictors of self-efficacy. However, longer marriage duration and the increased number of

Intention and self-efficacy for pap smear screening

gravidities and parities were significant positive predictors of self-efficacy.

## Recommendations

The current study recommends:

- The Saudi government should put CC as the top priority for action through fostering and expanding the implementation of CC screening and HPV immunization programs.
- Developing advocacy programs for the prevention of CC
- Campaigning for awareness-raising about CC and cutting down the cultural concern about Pap testing

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## Conflict of interest

None

## 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. *Nahari*- 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. *Ibrahim*- The conception and design of the study, drafting the article. *Sayed*- Revising the article 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.

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