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Knowledge, attitudes, and practices among Saudi women regarding cervical cancer, human papillomavirus (HPV) and corresponding vaccine

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ABSTRACT

Aim: To our knowledge there are no studies exploring Saudi women's understanding of the importance of the human papillomavirus (HPV) vaccine. In the present study, we examined the awareness of HPV and women's attitudes toward the HPV vaccine.
Method: Nine focus groups were formed in Riyadh City, Saudi Arabia, including 77 women between the ages of 18 and 45 years old. Face-to-face interviews were conducted in 58 female healthcare providers to examine women's awareness of cervical cancer, HPV, barriers, acceptance, beliefs, and attitudes towards the HPV vaccine.
Results: Focus group discussions revealed a lack of knowledge and awareness of cervical cancer, HPV, and the HPV vaccine. Cultural concerns regarding screening and vaccinating for a conventionally known sexually transmitted infection were an emerging theme in addition to not perceiving cervical cancer screening as necessary because women with no signs and symptoms considered themselves not at risk for developing cervical cancer. Approximately 30% of healthcare providers other than physicians were unaware of prevention methods, and 63.3% did not practice any screening methods for cervical cancer and attributed the lack of screening to "no specific reasons at all".
Conclusion: Because of the unfavorable knowledge and attitude of HPV infection and the associated vaccine from the women in the present study, emphasis should be directed to educate and promote awareness of women to the risk factors of cervical cancer and to the need for screening programs and the administration of the vaccine.

1. Introduction

Cervical cancer is the fourth most common cancer among women in the world [1]. In addition, cervical cancer is the eighth most common cancer in Saudi Arabia in females between the ages 14 and 44 [2]. According to the GLOBOCAN report in 2012, Saudi women have an estimated cervical cancer incidence of 2.2 per 100,000 age-standardized rate (ASR). Of these 241 women, 84 (34.8%) have died due to cervical cancer [1]. Many factors have been identified as contributors to cervical cancer among women living in different regions of the world, including the prevalence of HPV, lack of screening programs, limited access to care, social environment that fosters certain behavioral factors, and values and beliefs concerning cervical cancer [3–6].

Cervical cancers are mostly caused by the human papillomavirus (HPV) [1], and high-risk human HPV16 and 18 (included in the vaccine) contribute to approximately 70% of cancers [7]. HPV types 6 and 11 are considered non-cancer causing, low-risk viruses that cause genital warts and cervical lesions [8]. HPV infection is a conventional sexually transmitted infection; however there has been suggestions of other modes of transmission such as from hands to genitals or from the surfaces in medical settings. (Reference: Liuz, pubmed ID 26433493). Information is limited about its prevalence and genotype in Saudi Arabia. A study conducted among 100 women showed a prevalence of 6% of HPV positive cases [9]. In a second study conducted among 485 women, the same percentage was confirmed [10]. Results from quantitative studies in Saudi Arabia (al-Shaikh; PMID PMID:25316467) and the region (al-Mee, PMID:22276494; Jassem, PMID:29325528) showed knowledge and practice for cervical cancer screening and HPV are generally inadequate.

In a previous study, an alarmingly high prevalence (31.6%) of HPV 16 and 18 infection among 120 women was reported [11].

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Despite the fact that there is a scarcity of information regarding the prevalence of the HPV virus, young women in Saudi Arabia may benefit from the HPV vaccine because of the potential increase of cervical cancer rates in the country. Furthermore, the incidence of HPV infection in invasive cervical cancer in Saudi Arabia is as high as 96% and is compatible with the worldwide reported rate of 85–99% [2]. Reasons why Saudis may or may not accept the HPV vaccine to prevent cervical cancer are unknown and may range from material circumstances and lack of education to cultural beliefs and values.

Because the unique features of the Saudi Arabian culture may play a role in the acceptance of the HPV vaccine, we believed it was essential to explore the factors that might affect acceptance in metropolitan Riyadh, Saudi Arabia. To our knowledge there are no studies exploring Saudi women's understanding of the importance of the human papillomavirus (HPV) vaccine in a qualitative and in-depth exploration of the topic. In the present study, we examined the awareness of HPV and women's attitudes toward the HPV vaccine.

2. Methods

Focus groups were formed in Riyadh City, Saudi Arabia for women between the ages of 18 and 45 years old (many of them were either eligible for the HPV vaccine or mothers of young girls), and face-to-face interviews were conducted among healthcare providers. Different types of individuals from the Saudi community were included in our study to examine the awareness of cervical cancer and HPV, barriers, acceptance, beliefs, and attitudes towards the HPV vaccine. Results of this work will enable healthcare providers to develop effective educational materials and interventions tailored to Saudi women. The present study was conducted between September and November 2016.

2.1. Participants' recruitment

Participants for the focus groups were recruited from different areas of Riyadh with the help of community-based research assistants that were working on other community-based projects. Women were approached in the waiting areas of clinics and asked if they would be interested in being a part of a one-hour discussion group concerning a women's health issue. Participants were invited to the study after a brief explanation of the objectives. The focus groups were comprised of women between the ages of 18 and 45 (some of them were mothers of young girls). All participants signed consent forms and filled out a short form with demographic information prior to the start of the guided discussion.

The two types of participants (physicians and other healthcare providers) were recruited for the face-to-face interviews from several hospital departments around Riyadh City. Additionally, particpates were recruited by research assistants based in the hospitals. Face-to-face interviews were conducted among women healthcare workers in their place of work after receiving consent.

2.2. Focus groups

Focus group sessions were held in different locations, including rooms that were a part of a healthcare center, community rooms, and small meeting rooms for employees in academic settings. A trained research assistant/moderator led the focus groups, and a second research assistant/moderator recorded field notes and group interactions. Focus groups lasted around 60 min each. All sessions were audio recorded, and the recording was later transcribed verbatim and re-checked for accuracy.

Structured topic guide and questions that guided the focus group discussions concerning HPV included concepts related to knowledge about cervical cancer (causes, preventive measures, screening, and early detection), awareness regarding HPV (HPV-related diseases, transmission modes, availability of vaccine, and barriers to implementation of vaccine). In addition, at the end of the focus group, participants were asked if they have ever been informed by a healthcare provider about the HPV vaccine.

Focus group participants received a short educational session regarding HPV and the HPV vaccine after ending all discussions. Following the session they were asked to provide input about whether they would like to receive the HPV vaccine if they met the recommended criteria for intake. Furthermore, participants were asked if they would seek the HPV vaccine to their children.

2.3. Face-to-face interviews

Face-to-face interviews were conducted by a trained researcher. Healthcare providers were approached in their place of work during regular work hours and were consented for participation. A semi-structured questionnaire was developed for the present study and based on questions previously documented in the literature and others that were designed for the study.

Before collecting the data from the actual sample, the interview was administered among a small group of women healthcare workers in a community clinic to ensure clarity and comprehension. In addition to sociodemographic characteristics, questions related to knowledge regarding cervical cancer (causes, preventive measures, screening, and early detection), knowledge about HPV and transmission modes, awareness of the availability of the HPV vaccine and its effectiveness, ever being vaccinated for HPV, perceived barriers for the implementation of the vaccine, and the willingness to administer the vaccine to their own children. The interview lasted approximately 30 min.

2.4. Data analysis

Transcribed focus group discussions were read by two research investigators. Qualitative data were coded according to the recommendations by Miles and Huberman [12]. The manually generated coding tree was used as an aid to enter all coded data into the Nvivo software (QSR International Pty Ltd, Burlington, USA) for qualitative data assessment. Emerging themes from the focus groups were extracted and examined. Major themes were supported by quotations for better illustration of ideas. Face-to-face interviews were coded according to an exhaustive and cumulative list of responses. All responses and details of the interviews were coded, entered into a data sheet, and reported accordingly.

3. Results

3.1. Participants' characteristics

Nine focus groups were formed that included 77 women (Table 1). In addition, we conducted in depth interviews with female health care providers (n = 58). The interviewed health care providers were comprised of 28 physicians (16 from obstetrics/gynecology and 12 from family practitioners), 17 nurses, 7 health educators, and 6 pharmacists. Participants all resided and worked in Riyadh City. Among all participants, 79 were parents of at least one child. Approximately 20% of the women who participated in the focus groups had an education of high school or less.

Table 1
Characteristics of participants in focus groups and face-to-face interviews, including women from the general population, physicians, and other healthcare providers.

Characteristics		General Population n = 77 (%)	Physicians n = 28 (%)	Other Healthcare Providers n = 30 (%)
Age (years)	Mean (SD)	38 (12.5)	41.4 (9.3)	27 (9.62)
	Range	18–45	28–57	20–51
Marital Status	Single	21	2	9
	Married	53	26	21
	Divorced/Widowed	3	0	0
Children	Yes	33	26	20
	No	44	2	10
Education	≤High school	15	0	0
	College or more	62	28	30
Years of Experience[a]	Mean (SD)	3.1 (3.5)	17 (9.9)	11.5 (12.2)
	Range	1–7	5–33	2–15
Screening Behavior of cervical cancer				
	Yes	6	17	7
	No	71	11	23

[a] These characteristic results were generated from employed participants only.

3.2. Focus group themes

Many themes emerged from the data collected during the focus groups discussions:

(1) Knowledge and practices regarding cervical cancer, HPV, and the HPV vaccine; (2) attitudes and beliefs about the HPV vaccine; and (3) barriers to take and adopt the use of the vaccine.

3.2.1. Theme 1 - knowledge and practices

Focus group discussions revealed a lack of knowledge and awareness concerning cervical cancer, HPV, and the HPV vaccine among the Saudi women residing in Riyadh (Table 2). The majority of the women did not know what causes cervical cancer. Several attributed cancers to "poor personal hygiene" and others thought it is a "genetic disease". As one participant stated, "I think cervical cancer is caused by lack of cleanliness…".

Most groups reported that prevention from cervical cancer could be achieved by visiting the gynecologist on a regular basis when a woman starts experiencing unusual symptoms and pain. One participant discussed this issue and said "…I think a woman should visit the doctor whenever she has abnormal secretions…". Many women recommended a healthy diet and exercise for the prevention of cervical cancer. Regarding early detection of cervical cancer, more than half of the participants (52%) said that they "don't know". Less than 8% of all focus group members claimed being screened for cervical cancer.

Most group members reported not knowing about HPV and that it is a sexually transmitted infection. Only 7 participants (9%) from all groups reported having some knowledge about HPV, and one of them mentioned that it is related to genital warts and another added "…I heard about it because of my education…". Regarding the transmission of the virus, there was no knowledge to be shared except that few of the women discussed the probability that it may be transmitted via "…illegal sexual relationships…".

Only women that initially claimed some knowledge concerning HPV declared knowing about the HPV vaccine. Most groups discussed the fact that the population in Saudi Arabia did not know about the HPV vaccine, how it works, or how is it going to help them. No focus group participants had received the HPV vaccine, and only two women (2.6%) mentioned that they had been informed regarding the vaccine by their healthcare provider.

3.2.2. Theme 2 - attitudes and beliefs

Women from the focus groups expressed that cervical cancer screening was unnecessary because they considered themselves not at risk for developing cervical cancer because they exhibited no signs and symptoms. After hearing claims about HPV transmission and the HPV vaccine from other participants, many of the conversations among women centered on the fact that the Saudi Arabian population is religious and conservative and that sexually transmitted diseases are less likely to occur.

Table 2
Knowledge, attitude, and barriers associated with cervical cancer, HPV, and HPV vaccine for women participating in focus groups and face-to-face interviews.

Characteristics	Women	Physicians	Other Healthcare Providers
Knowledge			
Ever heard of cervical cancer	+/–	+	+
Risk factors associated with cervical cancer	–	+	+/–
Screening for cervical cancer (pap tests)	–	+	+
Ever heard of HPV	+/–	+	+/–
Transmission of HPV	+/–	+	+/–
HPV vaccine	–	+/–	+/–
Attitude			
Importance of screening for cervical cancer	+/–	+	+/–
Need for HPV vaccine	–	+/–	+/–
Effectiveness of protection modes	–	+/–	+/–
Uptake of HPV vaccine	–	+/–	+/–
Barriers			
Lack of knowledge and awareness	+	+	+
Cultural restrictions for such practice	+	+	+

(+) Existing knowledge; (–) Non-existing knowledge; (+/–) Existing and non-existing knowledge.

This culturally relevant claim was expressed by one participant who stated "...I don't see the point of vaccinating the girls, when they are not married, and we do not have behaviors and practices that make us need it...we are a conservative society and our religion protects us from having relations before marriage..." and another added "...I do not support the vaccine when the disease is not going to affect them ...every medicine has side effects, and we don't want to expose our children to something that is not common...". One woman concluded "...Maybe it is a good idea to give the vaccine immediately before marriage and never for young girls... but we need to know more about it...no one told us anything...".

A few interesting beliefs emerged from the focus groups. Many women believed that cervical cancer is a genetic disease. Some women believed that they could get cervical cancer by using public restrooms, having poor personal hygiene, and using cleaning products and soaps with a high content of chemicals. Others thought that the spice "turmeric" and "musk" are highly effective for protection from cervical cancer and that there is no cure for cervical cancer.

3.2.3. Theme 3 - barriers

Many barriers to screening for cervical cancer and the HPV vaccine were identified by the focus groups. Issues, such as lack of information about cervical cancer, neglecting the pap smear due to lack of time, fear, being a virgin, not wanting to undergo an invasive procedure, and poor patient-provider communication, were all addressed by the participants. Healthcare barriers raised by participants were identified by a woman who stated the following:

> *I thought about it once but did not ask for more information...I postponed it because I didn't have the time and my doctor never told me to do it...I would say that in our communities, a lot of women are not married and do not have illegal sexual relations...not like in western countries...this causes them infections...we don't have a this...no need in our society...many women in our communities go to the doctor only when they are sick...many women need to wait for their husbands or fathers to take them...*

Lack of information regarding the HPV vaccine was a persistent obstacle throughout the study. However, due to the guided discussions during focus groups, many women started to listen and understand the information concerning HPV from the few women who knew about it. Women were consistently saying that their healthcare providers need to tell them about such health issues, how it affects them, and advise them on what to do.

There was a concern that the healthcare providers themselves do not have enough information regarding the HPV virus and the vaccine.

Participants voiced the concern that many women in Saudi Arabia have difficult life circumstances because of male guardianship and not being able to make decisions on many healthcare-related issues for themselves and their children. One mother of three girls stated the following: "...the doctor need to tell my husband about the vaccine, and that the girls need it...I can't make the decision by myself...he has to agree...he will never accept if he knows what I just heard here...it is a problem..."

Other specific difficulties concerning the HPV vaccine were identified, including the availability of the vaccine at healthcare facilities and whether it would be free of cost. One common issue was the concern of cultural and social factors, including the attitude towards prevention from sexually transmitted diseases in a country where such discussions were prohibited, lack of privacy for those requesting the HPV vaccine, and strong concerns regarding the withholding of information regarding vaccine safety and side effects.

3.3. Interview responses

3.3.1. Healthcare providers (other than physicians)

All healthcare providers responded positively to the questions related to knowledge of cervical cancer. Although approximately half (53.3%) of the healthcare providers did not know about the causes of cervical cancer and no more than 16.7% linked it to HPV. Approximately 30% of healthcare providers did not know about methods of prevention; however, as many as 70% mentioned screenings as a method for early detection.

The majority (63.3%) of the participants from the healthcare provider group claimed not practicing any screening methods for cervical cancer and attributed this lack in screening to "...no specific reasons at all ..." or to "...not having symptoms and not needing it..." (46.7% and 33.6%, respectively).

Half of the healthcare providers claimed not having any knowledge regarding HPV. Among the women healthcare providers who recognized the virus, 75% attributed its transmission to sexual behavior, and a few mentioned its association with genital warts. Knowledge concerning the HPV vaccine was very low among healthcare providers (36.7%). After hearing few details concerning the HPV vaccine, the most common response to the perceived barriers of its intake among this group of women in healthcare was "...not knowing about it..." (40%), "...unavailability in the healthcare facilities..." (36.7%), and "...lack of guidelines and recommendations for the vaccine..." (26.7%). Approximately 56.7% of healthcare providers insisted that even if the vaccine was available, there is a religious and cultural resistance to its administration.

One nurse supported the argument that the HPV vaccine is not needed and stated "...there is no need for this kind of vaccine in our culture...this is a conservative society... we have to be careful about what we are preaching...are we encouraging promiscuity by giving the vaccine?". When healthcare providers were asked if they would administer the vaccine to their children, approximately half of them said that they would.

An important point was raised by one healthcare participant related to the availability and accessible information regarding the HPV vaccine, she expressed the following:

> *...I think may be because the topic is sensitive and not easy to talk about, I should have information to read about it or give to my patients, it will be easier to understand and I will be more convinced about the vaccine, and maybe I will give it to my daughters or even recommend it...privacy is a big issue...*

Table 3 presents the major responses and supporting quotations from the face-to-face interviews with this group of healthcare providers.

3.4. Physicians

Physicians were not aware of the prevalence of cervical cancer or HPV in the Saudi population and mostly claimed that cervical cancer and HPV were "uncommon". Regarding the clinical practice guidelines for cervical cancer screening and diagnosis, the most common response (57.1%) was that there are no clear guidelines and no available protocol. Physicians claimed that they usually refer women for further testing when they present with symptoms of cervical cancer or HPV infection.

None of the physicians that were interviewed have provided counseling regarding HPV, and they attributed this lack in practice due to the sensitivity of the topic in an environment that discourages open discussions about sexually transmitted diseases. Physi-

Table 3
Main emerging responses from face-to-face interviews among healthcare workers (other than physicians) (N = 30).

Characteristics	Emerging Response	N (%)
Knowledge		
Causes of cervical cancer	"Don't know"	16 (53.3)
Prevention from cervical cancer	"Early screening"	21 (70)
Transmission of HPV	"By sexual relations"	11 (36.7)
Attitude		
Cervical cancer screening	"No need with no signs	14 (46.7)
Vaccinating own children	"Yes; if there enough evidence that it is safe"	
Barriers to vaccine implementation		
Lack of knowledge	"No one knows about it"	12 (40)
No available recommendations	"Not available and no available guidelines"	11 (36.7)
Opposing culture	"People will not accept such a vaccine"	17 (56.7)

Table 4
Main emerging responses from face-to-face interviews among women physicians (N = 28).

Characteristics	Emerging Response	N (%)
Knowledge		
Epidemiology of cervical cancer in Saudi Arabia	"Not common"	21 (75)
Epidemiology of HPV in Saudi Arabia	"Don' know"	13 (46.4)
Practices		
Current practices regarding cervical cancer screening	"No protocol or guidelines"	16 (57.1)
Providing counseling regarding HPV	"We don't give any"	28 (1 0 0)
Barriers		
HPV knowledge	"Against conservative culture"	22 (78.6)
HPV vaccine	" Lack of awareness and availability"	19 (67.9)
Education		
Need for information	"Protection, prevention, and symptoms"	21 (75)
Target group	" Everyone; including Doctors"	26 (92.9)
Type of program for the general population	"Awareness campaigns via social media"	12 (42.9)
Type of program for healthcare workers	"Workshops and training "	20 (71.4)
Myths among patients (*cervical cancer & HPV*)[a]	" Inherited or due to poor hygiene"	5 (17.9)

[a] Physicians gave responses regarding their patients' beliefs concerning cervical cancer and HPV infection.

cians were convinced that the lack of knowledge concerning cervical cancer and HPV among the general population and the healthcare community, in addition to the sensitive nature of the topic, were barriers in their practice.

According to the interviewees from the physician's group, the most encountered myths regarding cervical cancer among their patients are that it is a genetic disease and that it is caused by poor personal hygiene practices (78.6% and 61.9%, respectively). The idea that "...cervical cancer is not treatable and there is no benefit from screening..." was also mentioned by three of the physician participants as a common belief among their patient population.

The majority of the physicians (75%) said that education related to cervical cancer and HPV was a necessity among the general population and the healthcare community in Saudi Arabia. A family physician working in primary healthcare clinics stated the following:

> *...patients at risk have to be identified in primary health care, and in order to be able to do this we need extensive education and training in addition to governmental support ... another said ...a policy should be implemented during pre-marital screening to inform about cervical cancer and HPV and offer the HPV vaccine...*

A total of 42.9% of physicians suggested that social media could promote cervical cancer screening and information regarding HPV and the HPV vaccine. However, few physicians suggested printed material could be distributed in healthcare centers and waiting rooms of different clinics and hospitals due to the sensitivity of the topic and cultural bias against publicly discussing sexually transmitted diseases. Select responses from interviews with physicians are presented in Table 4.

4. Discussion

To our knowledge, this is the first qualitative study that has investigated the knowledge, attitude, and barriers regarding cervical cancer, HPV, and the HPV vaccine among women from the same geographical area, including members of the community, physicians, and other healthcare providers.

Although HPV vaccination alone or combined with screening have been documented as effective interventions for reducing the burden and mortality of cervical cancer across various settings, the basic knowledge regarding the cause of cervical cancer remains absent in some communities, such as women in Saudi Arabia, where misconceptions concerning cervical cancer and HPV are common. These misconceptions are most likely due to differences of culture and/or education.

For example, various results were obtained from a previous study conducted among Chinese women from various regions concerning the knowledge of cervical cancer, HPV, and the HPV vaccination [13]. A range of 45–77% of Chinese women exhibited some knowledge of cervical cancer, 22.1–35% acknowledged that HPV was a causative agent of cervical cancer, and 13.3–19.4% were aware that the HPV vaccine protected against cervical cancer [13–15]. However, several studies have reported that 94% of women from Australia and migrant women in the United Kingdom are aware that HPV is a causative factor of cervical cancer [16,17].

Generally, Saudi women have a low incidence of cervical cancer (2.2 per 100,000 women) [18]. However, in some African countries, such as in Gabon, the annual incidence of cervical cancer is 19.9 per 100,000 women, which is higher than that of breast cancer, and

these women showed a poor level of knowledge of cervical cancer and HPV (22.7% and 8.8%, respectively) [19].

Several previous studies have reported women's knowledge and awareness of cervical cancer. HPV vaccine knowledge and awareness is a strong predictor of vaccine receipt or intention to vaccinate [20,21]. Understanding cervical cancer and the role of HPV is more predictive of vaccination behaviors [22]. Similar results have been reported in Indonesia, where 66% of parents are aware of cervical cancer, however only 16% had heard of HPV, which is similar to what has been reported in Quebec City, Canada (15%) [23,24]. Moreover, 67.6% of mothers were aware of HPV in Hong Kong [25].

In our study, Saudi women exhibited a negative belief related to cervical cancer screening. The majority of women considered themselves not at risk for developing cervical cancer, and that there was no reason for a screening test if no signs and symptoms existed. These results suggest the lack of awareness of cervical cancer and the importance of screening. Similar studies have reported poor attitudes toward cervical cancer screening, mainly in developing countries [26]. A previous study among Southern African women found that only 3.2% demonstrated a positive attitude for cervical cancer screening, where Pap smear was used as a screening method [27]. In addition, findings from Chinese American immigrant women believed that there was no need for a Pap test if no symptoms existed [28] and Spanish adolescents did not consider themselves at risk for HPV infection [29].

A previous study in Nicaraguan women reported that women felt embarrassed and shameful by the intimacy of the Pap smear test [30]. However, our study was qualitative in nature, where age was not factored among the focus group participates, therefore knowledge and beliefs could have differed between older and younger women.

A previous study has shown that age was an influential factor on participant's knowledge and beliefs regarding cervical cancer, where young women were more likely to understand the role of cervical cancer screening compared with elderly women [27]. The role that healthcare providers play in giving advice and recommendations for cervical cancer screening was not evident in our study compared with a previous American study; however, there remained a limited knowledge of cervical cancer causes and the role of HPV in American women [31].

Therefore, it is important to enhance the role of primary healthcare facilities, private practices, and government offices to increase the level of knowledge and awareness of cervical cancer and screening methods among women and provide the accepted screening facilities. Recently, many countries have implemented educational campaigns to improve the knowledge of cervical cancer prevention and encourage women to accept new methods for screening, including HPV diagnostics and proliferation, and detection of epigenetic changes, either in the patient host or virus [32,33]. In our study, limitations of screening methods and the HPV vaccine were lacking in the general population of women, healthcare providers, and physicians. In addition, Studies conducted among women of all age groups in Saudi arabia suggested a persistent less than optimal level of knowledge about breast cancer (Alotaibi PUBMED ID28240511) and a low level of knowledge about protection from Sexually transmitted diseases and infections associated with it (El-Tholoth Pubmed Id 2971933).

In many settings, obstetrician and gynecologists, family medicine practitioners, and nurses are considered the backbone of primary healthcare; thus, they should be at the forefront of making the services available to the communities by informing and encouraging women to make use of cervical cancer screening services. If health workers are knowledgeable and are pro-prevention of cervical cancer, they will encourage women to use screening services [27,34]. Reasons why Saudi populations in the region may not accept the Pap smear test for cervical cancer screening are unknown; however, the response level varied from one country to another. For example, only 23.8% of married Kuwaiti women had a Pap smear test for cervical cancer screening [35]. Approximately 16.8–33.0% of Saudi women in Riyadh City [36–38], 28% of Jordanian women [39], and 40% of Qatari women had performed the screening test [40]. Although the Pap test was performed in governmental and private healthcare facilities in Saudi Arabia, no accurate rate has been reported among Saudi women.

Although women in some GCC countries showed a good response in receiving and asking for the vaccine against HPV [35,41,42], Saudi women were more likely to be less familiar with this new protective type of vaccine against cervical cancer. The responses from our study indicated barrier in HPV vaccination education, effectiveness of protection modes, lack of knowledge and awareness, and cultural restrictions for successful screening practices for cervical cancer and the adoption of the HPV vaccine among Saudi women. These results coincide with other studies conducted among women in Saudi Arabia [36,43].

Since the uniqueness of the Saudi culture may play a role in the acceptance of the HPV vaccine, it is essential to explore the factors that might affect the acceptance of the vaccine. Similarly to the Heaptitis B vaccine, the HPV vaccine can very well be incorporated in the National Immunization Program in Saudi Arabia and neighboring countries. Following the recommendations of the WHO, Saudi Arabia has incorporated HBV vaccination into national immunization programs for infants since 1989 (Ibrahim, International Journal of Virology and Molecular Biology 2016, 5(1): 8–15 DOI: https://doi.org//10.5923/j.ijvmb.20160501.0). Therefore, more research in different countries in the Saudi region, including unified research tools and methodology, is required in order to implement this program of immunization effectively. Future studies could clarify the variation of reasons and attitudes of women with a clear correlation of the potential associated factors, such as education, cultural, and religious issues. In addition, an useful framework for creating targeted educational intervention to improve cervical cancer knowledge and rates of Pap test screening among women could be established. Such an intervention would need to address the seriousness and heightened risk of susceptibility to cervical cancer as well as consider the various facilitators, barriers, and cultural and individual beliefs specific to women from each country.

5. Limitations

Our study had design limitations within the focus groups. In addition to its nature as a cross-sectional design, no direct causal relationship between the variables could be completed. The results of the present study may not be generalizable to the population of all women or to all healthcare providers or physicians; particularly in rural areas of Saudi Arabia. In some of the focus groups, we allowed participants to lead the conversations because they knew more about the other women and they passed on information that other participants never heard or alienated their opinions.

6. Conclusion

The knowledge and attitude of the women in our study regarding HPV infection and the HPV vaccine were discouraging. Therefore, we emphasize the need to educate and promote awareness of women to the risk factors of cervical cancer and the need for screening programs. A well-designed health education program concerning cervical cancer and the benefits of screening and vaccination would increase the awareness among Saudi women.

Competing interests

The author declares no competing interests.

Declarations of interest

None.

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Ethical approval

The present study is a qualitative study that was conducted after receiving ethical approval from King Abdullah International Medical Research Center (KAIMRC; #Sp17-118-R) and the Institutional Review Board at King Saud Bin Abdulaziz University for Health Sciences (KSAU-HS), Saudi Arabia.

Advances in Knowledge:

- Provide baseline knowledge of cervical cancer causes and methods of protection to women.
- Findings resulted in valuable qualitative feedback for designing cervical cancer screening method intervention programs.
- Show to what extent culture and background beliefs can influence the acceptance of the HPV vaccine.

Application to Patient Care:

- Evidence for disseminating education and awareness of cervical cancer protection methods among women
- Increasing the level of understanding the barriers that contribute to scaling down the use of the HPV vaccine
- Enhance awareness of the HPV vaccine among Saudi women, which may help to increase vaccine use and early cervical cancer screening in the community.

References

[1] Ferlay J, Soerjomataram I, Dikshit R, Eser S, Mathers C, Rebelo M, et al. Cancer incidence and mortality worldwide: sources, methods and major patterns in GLOBOCAN 2012. Int J Cancer 2015;136(5). https://doi.org/10.1002/ijc.29210.
[2] Alsbeih G. HPV infection in cervical and other cancers in Saudi Arabia: implication for prevention and vaccination. Front Oncol 2014;4. https://doi.org/10.1016/j.ygyno.2011.01.033.
[3] Onon TS, Kitchener HC. The use of vaccines in treating cervical cancer: present status and future prospects. Int J Gynecol Cancer 1999;9(4):265–78. https://doi.org/10.1046/j.1525-1438.1999.99022.x. https://www.ncbi.nlm.nih.gov/pubmed/11240779.
[4] Yabroff KR, Lawrence WF, King JC, Mangan P, Washington KS, Yi B, et al. Geographic disparities in cervical cancer mortality: what are the roles of risk factor prevalence, screening, and use of recommended treatment? J Rural Health 2005;21(2):149–57. https://doi.org/10.1111/j.1748-0361.2005.tb00075.x. https://www.ncbi.nlm.nih.gov/pubmed/15859052.
[5] Guan P, Howell-Jones R, Li N, Bruni L, de Sanjose S, Franceschi S, et al. Human papillomavirus types in 115,789 HPV-positive women: a meta-analysis from cervical infection to cancer. Int J Cancer 2012;131(10):2349–59. https://doi.org/10.1002/ijc.27485. https://www.ncbi.nlm.nih.gov/pubmed/22323075.
[6] Richardson LA, Tota J, Franco EL. Optimizing technology for cervical cancer screening in high-resource settings. Exp Rev Obstet Gynecol 2011;6(3):343–53. https://doi.org/10.1586/eog.11.13. https://www.ncbi.nlm.nih.gov/pubmed/26617667.
[7] Munoz N, Castellsagué X, de González AB, Gissmann L. HPV in the etiology of human cancer. Vaccine 2006;24:S1–S10. https://doi.org/10.1016/j.vaccine.2006.05.115.
[8] Lacey CJ, Lowndes CM, Shah KV. Burden and management of non-cancerous HPV-related conditions: HPV-6/11 disease. Vaccine 2006;24:S35–41. https://doi.org/10.1016/j.vaccine.2006.06.015.
[9] Gazzaz FS, Mosli HA. Lack of detection of human papillomavirus infection by hybridization test in prostatic biopsies. Saudi Med J 2009;30(5):633–7. https://www.smj.org.sa/index.php/smj/article/view/6610.
[10] Bondagji NS, Gazzaz FS, Sait K, Abdullahc L. Prevalence of high-risk human papillomavirus infections in healthy Saudi women attending gynecologic clinics in the western region of Saudi Arabia. Ann Saudi Med 2013;33(1):13. https://doi.org/10.5144/0256-4947.2013.13.
[11] Al-Muammar T, Al-Ahdal MN, Hassan A, Kessie G, Cruz DD, Mohamed GE. Human papilloma virus-16/18 cervical infection among women attending a family medical clinic in Riyadh. Ann Saudi Med 2007;27(1):1. https://doi.org/10.4103/0256-4947.51540.
[12] Miles MB, Huberman AM, Saldana J. Qualitative data analysis: a methods sourcebook. 3rd ed. SAGE Publications; 2013. p. 408. 1971–1974.
[13] Baloch Z, Yasmeen N, Li Y, Zhang W, Lu H, Wu X, et al. Knowledge and Awareness of Cervical Cancer, Human Papillomavirus (HPV), and HPV Vaccine Among HPV-Infected Chinese Women. Med Sci Monit 2017;23:4269–77. 10.12659/MSM.903370.
[14] Hong Y, Zhang C, Li X, Lin D, Liu Y. HPV and cervical cancer related knowledge, awareness and testing behaviors in a community sample of female sex workers in China. BMC Public Health 2013;13:696. https://doi.org/10.1186/1471-2458-13-696. https://www.ncbi.nlm.nih.gov/pubmed/23898889.
[15] Feng S, Xu X, Jin Y, Yao X. Women's knowledge of human papillomavirus (HPV) and their attitudes toward HPV vaccine: preparing for HPV vaccination in China. Asia Pac J Public Health 2012;24(3):522–31. https://doi.org/10.1177/1010539511415838. https://www.ncbi.nlm.nih.gov/pubmed/21807623.
[16] Waller J, Jackowska M, Marlow L, Wardle J. Exploring age differences in reasons for nonattendance for cervical screening: a qualitative study. BJOG 2012;119(1):26–32. https://doi.org/10.1111/j.1471-0528.2011.03030.x. https://www.ncbi.nlm.nih.gov/pubmed/21668764.
[17] Tung IL, Machalek DA, Garland SM. Attitudes, Knowledge and Factors Associated with Human Papillomavirus (HPV) Vaccine Uptake in Adolescent Girls and Young Women in Victoria, Australia. PLoS ONE 2016;11(8). https://doi.org/10.1371/journal.pone.0161846. e0161846 https://www.ncbi.nlm.nih.gov/pubmed/27564213.
[18] SHC/SCR. Cancer Incidence Report, Saudi Arabia. 2014. Riyadh. KSA: Saudi Health Council/Saudi Cancer Registry; 2017. Report No.: 616–992. <http://www.chs.gov.sa/Ar/HealthCenters/NCC/CancerRegistry/CancerRegistryReports/2014.pdf>.
[19] Assoumou SZ, Mabika BM, Mbiguino AN, Mouallif M, Khattabi A, Ennaji MM. Awareness and knowledge regarding of cervical cancer, Pap smear screening and human papillomavirus infection in Gabonese women. BMC Womens Health 2015;15:37. https://doi.org/10.1186/s12905-015-0193-2. https://www.ncbi.nlm.nih.gov/pubmed/25924940.
[20] Savas LS, Fernández ME, Jobe D, Carmack CC. Human papillomavirus vaccine: 2–1-1 helplines and minority parent decision-making. Am J Prev Med 2012;43(6):S490–6. https://doi.org/10.1016/j.amepre.2012.09.003.
[21] Bastani R, Glenn BA, Tsui J, Chang LC, Marchand E, Taylor VM, et al. Understanding sub-optimal HPV vaccine uptake among ethnic minority girls. Cancer Epidemiology Prev Biomarkers 2011. https://doi.org/10.1177/1403494815569105. cebp.0267.2011.
[22] Fishman J, Taylor L, Kooker P, Frank I. Parent and adolescent knowledge of HPV and subsequent vaccination. Pediatricspeds 2014:2013–3454. https://doi.org/10.1542/peds.2017-1081.
[23] Jaspers L, Budiningsih S, Wolterbeek R, Henderson F, Peters A. Parental acceptance of human papillomavirus (HPV) vaccination in Indonesia: a cross-sectional study. Vaccine 2011;29(44):7785–93. https://doi.org/10.1016/j.vaccine.2011.07.107.
[24] Sauvageau C, Duval B, Gilca V, Lavoie F, Ouakki M. Human papilloma virus vaccine and cervical cancer screening acceptability among adults in Quebec, Canada. BMC Public Health 2007;7(1):304. https://doi.org/10.1186/1471-2458-7-304.
[25] Loke AY, Chan ACO, Wong YT. Facilitators and barriers to the acceptance of human papillomavirus (HPV) vaccination among adolescent girls: a comparison between mothers and their adolescent daughters in Hong Kong. BMC Res Notes 2017;10(1):390. https://doi.org/10.1186/s13104-017-2734-2.
[26] Williams M, Kuffour G, Ekuadzi E, Yeboah M, ElDuah M, Tuffour P. Assessment of psychological barriers to cervical cancer screening among women in Kumasi, Ghana using a mixed methods approach. Afr Health Sci 2013;13(4):1054–61. https://doi.org/10.4314/ahs.v13i4.28. https://www.ncbi.nlm.nih.gov/pubmed/24940332.
[27] Ramathuba DU, Ngambi D, Khoza LB, Ramakuela NJ. Knowledge, attitudes and practices regarding cervical cancer prevention at Thulamela Municipality of Vhembe District in Limpopo Province. Afr J Prim Health Care Fam Med 2016;8(2):e1–7. https://doi.org/10.4102/phcfm.v8i2.1002. https://www.ncbi.nlm.nih.gov/pubmed/27380857.
[28] Lee-Lin F, Pett M, Menon U, Lee S, Nail L, Mooney K, et al. Cervical cancer beliefs and pap test screening practices among Chinese American immigrants. Oncol Nurs Forum 2007;34(6). https://doi.org/10.1188/07.ONF.1203-1209.
[29] Navarro-Illana P, Diez-Domingo J, Navarro-Illana E, Tuells J, Aleman S, Puig-Barbera J. Knowledge and attitudes of Spanish adolescent girls towards human papillomavirus infection: where to intervene to improve vaccination coverage. BMC Public Health 2014;14:490. https://doi.org/10.1186/1471-2458-14-490. https://www.ncbi.nlm.nih.gov/pubmed/24885391.
[30] Rees HD, Lombardo AR, Tangoren CG, Meyers SJ, Muppala VR, Niccolai LM. Knowledge and beliefs regarding cervical cancer screening and HPV vaccination among urban and rural women in León, Nicaragua. Peer J 2017;5:e3871. https://doi.org/10.7717/peerj.3871.
[31] Brown DR, Wilson RM, Boothe MA, Harris CE. Cervical cancer screening among ethnically diverse black women: knowledge, attitudes, beliefs, and practices. J

Natl Med Assoc 2011;103(8):719–28. https://doi.org/10.1016/S0027-9684(15)30411-9. https://www.ncbi.nlm.nih.gov/pubmed/22046849.
[32] Brown AJ, Trimble CL. New technologies for cervical cancer screening. Best Pract Res Clin Obstet Gynaecol 2012;26(2):233–42. https://doi.org/10.1016/j.bpobgyn.2011.11.001. https://www.ncbi.nlm.nih.gov/pubmed/22119058.
[33] Nwankwo K, Aniebue U, Aguwa E, Anarado A, Agunwah E. Knowledge attitudes and practices of cervical cancer screening among urban and rural Nigerian women: a call for education and mass screening. Eur J Cancer Care 2011;20(3):362–7. https://doi.org/10.1111/j.1365-2354.2009.01175.x.
[34] Mosavel M, Simon C, Oakar C, Meyer S. Cervical cancer attitudes and beliefs-a Cape Town community responds on World Cancer Day. J Cancer Educ 2009;24(2):114–9. https://doi.org/10.1080/08858190902854590. https://www.ncbi.nlm.nih.gov/pubmed/19431027.
[35] Al Sairafi M, Mohamed FA. Knowledge, attitudes, and practice related to cervical cancer screening among Kuwaiti women. Med Princ Pract 2009;18(1):35–42. https://doi.org/10.1159/000163044.
[36] Al Khudairi H, Abu-Zaid A, Alomar O, Salem H. Public Awareness and Knowledge of Pap Smear as a Screening Test for Cervical Cancer among Saudi Population in Riyadh City. Cureus 2017;9(1):e984. https://doi.org/10.7759/cureus.984.
[37] Aziza S, Badawy AS, Abeer F. Efficacy of counseling for cervical cancer screening and protective procedures on Saudi women's health beliefs and practice. JNEP 2016;7(2):117. https://doi.org/10.5430/jnep.v7n2p117.
[38] Sait KH. Attitudes, knowledge, and practices in relation to cervical cancer and its screening among women in Saudi Arabia. Saudi Med J 2009;30(9):1208–12. https://www.ncbi.nlm.nih.gov/pubmed/19750269.
[39] Al Nsour M, Brown DW, Tarawneh M, Haddadin R, Walk H. Breast and cervical cancer screening among women in Jordan: findings from the behavioural risk factor surveillance system-2007. Open Breast Cancer J 2012;4:1–7. https://doi.org/10.2174/1876817201204010001.
[40] Al-Meer F, Aseel M, Al-Khalaf J, Al-Kuwari M, Ismail M. Knowledge, attitude and practices regarding cervical cancer and screening among women visiting primary health care in Qatar. East Mediterr Health J. 2011;17(11):855–61. https://www.ncbi.nlm.nih.gov/pubmed/22276494.
[41] Elbarazi I, Raheel H, Cummings K, Loney T. A content analysis of arabic and english newspapers before, during, and after the human papillomavirus vaccination campaign in the United Arab Emirates. Front Public Health 2016;4:176. https://doi.org/10.3389/fpubh.2016.00176. https://www.ncbi.nlm.nih.gov/pubmed/27622185.
[42] Ortashi O, Shallal M, Osman N, Raheel H. Knowledge, attitude and practice of school nurses in the United Arab Emirates about HPV infection and vaccine. Asian Pac J Cancer Prev 2012;13(12):6481–4. https://doi.org/10.7314/APJCP.2012.13.12.6481.
[43] Salem MR, Amin TT, Alhulaybi AA, Althafar AS, Abdelhai RA. Perceived risk of cervical cancer and barriers to screening among secondary school female teachers in Al Hassa, Saudi Arabia. Asian Pac J Cancer Prev 2017;18(4):969. 10.22034/APJCP.2017.18.4.969.