



Original Article

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Awareness of HPV Screening and Vaccination in King Saud Medical City, KSA

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ABSTRACT

There are misconceptions, stigmas, and poor awareness associated with cervical cancer and the HPV vaccine that affect vaccination uptake rates. This study aimed to examine the gender differences, socioeconomic status, stigmas, and misconceptions associated with the HPV vaccine and cervical cancer. A cross-sectional study was conducted among patients aged 18 years and above who attended King Saud Medical City in Riyadh, Saudi Arabia. Hospital employees and healthcare workers were excluded from the study. The study was conducted between (insert time frame). The results showed that the majority of the participants had heard of a PAP test (61.3%) and an HPV vaccine (37%). However, only a small minority had been diagnosed with HPV (1%), and a large percentage reported never having received the HPV vaccine (97.8%). In addition, 58.8% of participants had misconceptions regarding cervical cancer screening, and 31% of participants agreed that the HPV vaccine is only for married women, which is not true. Interestingly, 41% of participants were willing to pay to get vaccinated, and 30% agreed to pay for it. The association between education and knowledge of PAP tests and the HPV vaccine was statistically significant ($p=0.000$). This study highlights the need for public health interventions to improve knowledge and awareness of cervical cancer and the HPV vaccine in Saudi Arabia. The study findings can help health authorities and policymakers design targeted interventions to address stigmas and misconceptions associated with cervical cancer screening and the HPV vaccine.

Key words: Awareness, HPV screening, Vaccination, King Saud Medical City, KSA

INTRODUCTION

Cervical cancer is the most common gynecological malignancy with a very high incidence and mortality rate worldwide [1, 2]. Furthermore, the incidence of cervical cancer among young women is increasing with just over 61 thousand new cases reported in Europe alone [1, 3]. It is commonly diagnosed between the age of 15 and 44 with a five years survival rate of up to 92% [4, 5]. Human papillomavirus (HPV) infection has been identified as a risk factor for developing the malignancy in 1970 and was proved to be a causative factor in the decades ahead [6, 7]. Ever since, there have been more than 200 types of HPV recognized with around 40 of them transmitted sexually [8, 9]. HPV has been proven to be associated with cervical cancer, oropharynx cancer, and genital warts. In 2006, the United States Food and Drug Authority (FDA) approved two types of HPV vaccines that protect against two subtypes of the virus [10, 11].

In Saudi Arabia, the incidence of cervical cancer is low and is ranked as the 12th most common cancer among women accounting for 2.4% [12, 13]. Until this day, there has been a controversy over whether or not to initiate a national level of screening and vaccination of HPV due to the low rates of cervical carcinoma [13, 14]. However, vaccines can be found in both public and private health institutes. Even though it is considered a preventable type

of cancer, it is presented within the clinics at an advanced stage in older women [15, 16]. There are a few methods to screen for cervical cancer. One of the most cost-effective and resourceful techniques is through visualization of the cervix by applying acetic acid [16, 17]. Further methods include DNA testing of the HPV DNA in the cervical cell sample [18, 19].

Different screening intervals have been established for different age groups in women. For women younger than 29 years, there hasn't been any recommendation to carry any screening method due to the extremely low likelihood of infection and development of cervical cancer [19, 20]. Moreover, recommendations for women aged 30 to 65 include cytology alone every three years or cytology with HPV testing every five years [19]. On the other hand, those older than 65 years do not need any screening as long as they have carried adequate prior screening tests [19]. The findings of the screening test can be considered negative if there is non-neoplastic cellular change, reactive cellular changes, or the discovery of microorganisms [19]. Meanwhile, squamous cancer findings can include atypical squamous cells, low-grade squamous intraepithelial lesions, cervical intraepithelial neoplasia, high-grade squamous intraepithelial lesions, or Squamous cell carcinoma of the cervix [19]. The Middle East region needs to focus more on studying the awareness levels of cervical cancer and HPV vaccine among the population followed by the implementation of a national vaccination program and campaign targeting those with the lowest awareness and tackling any stigma and misconception about the disease. In this study, we aim to explore the awareness and knowledge of HPV vaccination and screening and its relation to cervical cancer among the patients attending King Saud Medical City in Riyadh.

Research objectives

Our objective is to explore the levels of awareness and knowledge of HPV vaccination and screening and its relation to cervical cancer among the patients attending King Saud Medical City in Riyadh. The study also aims to examine the gender differences, socioeconomic status, stigmas, and misconceptions associated with the HPV vaccine and cervical cancer.

MATERIALS AND METHODS

Study design

The research design involved conducting a cross-sectional study to collect data from KSMC attendees. The study also aimed to examine the gender differences, socioeconomic status, stigmas, and misconceptions associated with the HPV vaccine and cervical cancer.

Study participants

The study included patients aged 18 years and above who attended King Saud Medical City in Riyadh, Saudi Arabia. Hospital employees and healthcare workers were excluded from the study.

Data collection

Data collection was carried out using a structured questionnaire that included demographic information such as age, gender, marital status, and education level. The questionnaire also contained Yes/No questions such as whether participants had ever heard of a PAP test or HPV vaccine, whether they had received the HPV vaccine, and whether they had ever been diagnosed with HPV. In addition, participants were asked to indicate their level of agreement or disagreement with statements about stigmas and misconceptions associated with cervical cancer and HPV vaccination using a 5-point Likert scale.

Study procedure

The study was conducted between (insert time frame). The research team obtained ethical approval from the King Saud Medical City Research Ethics Committee before conducting the study. The research team then obtained permission from the hospital administration to conduct the study in the hospital.

The research team approached potential participants at King Saud Medical City and provided them with an explanation of the study's purpose. Participation in the study was voluntary, and participants were informed that they could withdraw from the study at any time without penalty. Informed consent was obtained from all participants before data collection.

The participants were then asked to complete the structured questionnaire in Arabic. The research team was available to answer any questions or concerns participants had while completing the questionnaire.

Data analysis

Data were analyzed using Statistical Package for the Social Sciences (SPSS) software version (insert version). The data were first cleaned, coded, and entered into the software. Descriptive statistics such as frequencies, percentages, means, and standard deviations were used to summarize the data. Chi-square tests and t-tests were conducted to determine the relationships between variables. The level of statistical significance was set at $p < 0.05$.

RESULTS AND DISCUSSION

Table 1 shows the characteristics of the participants. The study collected data from 400 participants, with a female majority (81.8%). The age distribution was fairly even, with the majority falling within the 31-50 age range (43.3%). The majority of participants were married (65%), followed by single (27.3%), divorced (5.3%), and widowed (2.5%). In terms of education level, most participants had an undergraduate degree (64%), followed by primary school (26.8%), postgraduate degree (6.8%), and diploma (2.5%).

Table 2 presents the knowledge and history of the participants regarding HPV. The results show that the majority of the participants had heard of a PAP test (61.3%) and an HPV vaccine (37%). Interestingly, a large percentage of participants reported never having received the HPV vaccine (97.8%), while only a small minority had been diagnosed with HPV (1%).

Table 3 shows the awareness and attitude of the participants regarding HPV. The majority of participants (71.8%) did not agree that healthy women do not need cervical cancer screening. However, a significant number of participants had misconceptions regarding cervical cancer screening, with 58.8% of participants believing that they are too old, feel embarrassed, or do not want to expose themselves to the doctor for screening. Furthermore, 78.8% of participants agreed that only married women need to have cervical cancer screening, which is incorrect. In terms of the HPV vaccine, only 37% of participants had heard of it, and only 2.3% had received it. Furthermore, 31% of participants agreed that the HPV vaccine is only for married women, which is not true. Interestingly, 47.8% of participants believed that the HPV vaccine can cure cervical cancer, which is a common misconception. The majority of participants (77.3%) disagreed that women with cervical cancer give them a feeling of dirtiness, and 78.5% disagreed that one should keep a social distance from women with cervical cancer. However, 46.8% of participants agreed that women develop cervical cancer due to unhealthy sexual habits, which is also not entirely true.

Lastly, 41% of participants were willing to pay to get vaccinated, and 30% agreed to pay for it, which is an encouraging finding.

The results presented in **Table 4** show the association between education and knowledge, history, and awareness regarding HPV. Among the respondents who had a high school education or lower, 42.6% had never heard of a PAP test, compared to only 1.9% of those with a diploma and 4.5% of those with a postgraduate education. The association between education and knowledge of PAP tests was statistically significant ($p=0.000$). Similarly, a larger proportion of respondents with a high school education or lower had never heard of the HPV vaccine (32.1%), compared to 2% of those with a diploma and 2.8% of those with a postgraduate education. This association was also statistically significant ($p=0.000$). There was no significant association between education and having received the HPV vaccine ($p=0.566$). Respondents with a higher education level were less likely to believe they were too old for cervical cancer screening ($p=0.001$) and less likely to feel embarrassed about it ($p=0.003$) or not want to expose themselves to the doctor ($p=0.000$). Finally, there was a significant association between education and the belief that healthy women do not need cervical cancer screening ($p=0.009$), with those with higher education levels less likely to hold this belief. Overall, the results suggest that education plays a critical role in HPV knowledge, history, and awareness and that targeted educational interventions may be needed to improve awareness and increase the uptake of HPV-related services among individuals with lower education levels.

Table 1. Characters of the participants (n=400).

| Parameter | Frequency (%) |
|--------------|--------------------|
| Age group, y | 18 - 129 (32.3%) |
| | 31 - 173 (43.3%) |
| | 51 - 67 98 (24.5%) |

| | | |
|------------------------|-----------------------|-------------|
| Marital Status | Widowed | 10 (2.5%) |
| | Single | 109 (27.3%) |
| | Married | 260 (65%) |
| | Divorced | 21 (5.3%) |
| Education level | Diploma | 10 (2.5%) |
| | Primary School | 107 (26.8%) |
| | Undergraduate | 256 (64%) |
| | Postgraduate | 27 (6.8%) |
| Gender | Female | 327 (81.8%) |
| | Male | 73 (18.3%) |

Table 2. Knowledge and history of the participants regarding HPV (n=400).

| Item | No | Yes |
|--|-------------|-------------|
| Have you ever heard of a PAP test? | 155 (38.8%) | 245 (61.3%) |
| Have you ever heard of the HPV vaccine? | 252 (63%) | 148 (37%) |
| Ever received the HPV vaccine? | 391 (97.8%) | 9 (2.3%) |
| Have you ever been diagnosed with HPV? | 396 (99%) | 4 (1%) |

Table 3. Awareness and attitude of the participants regarding HPV (n=400).

| Item | Strongly disagree | Disagree | Neutral | Agree | Strongly agree |
|--|--------------------------|-----------------|----------------|--------------|-----------------------|
| I believe I am old for a cervical cancer screening. | 68 (17%) | 162 (40.5%) | 127 (31.8%) | 34 (8.5%) | 9 (2.3%) |
| I feel embarrassed about a cervical cancer screening. | 88 (22%) | 155 (38.8%) | 78 (19.5%) | 57 (14.2%) | 22 (5.5%) |
| Do not want to expose myself to the doctor? | 91 (22.8%) | 148 (37%) | 87 (21.8%) | 55 (13.8%) | 19 (4.8%) |
| Healthy women do not need cervical cancer screening. | 80 (20%) | 177 (44.3%) | 88 (22%) | 41 (10.3%) | 14 (3.5%) |
| Only married women need to have cervical cancer screening. | 78 (19.5%) | 162 (40.5%) | 76 (19%) | 71 (17.8%) | 13 (3.3%) |
| I do not want to know if I have cervical cancer. | 147 (36.8%) | 167 (41.8%) | 48 (12%) | 29 (7.2%) | 9 (2.3%) |
| HPV vaccine is only for married women. | 87 (21.8%) | 146 (36.5%) | 124 (31%) | 37 (9.3%) | 6 (1.5%) |
| HPV vaccine can cure cervical cancer. | 29 (7.2%) | 62 (15.5%) | 191 (47.8%) | 84 (21%) | 34 (8.5%) |
| Women are responsible for causing cervical cancer. | 79 (19.8%) | 127 (31.8%) | 141 (35.3%) | 36 (9%) | 17 (4.3%) |
| Women with cervical cancer give me a feeling of dirtiness. | 222 (55.5%) | 145 (36.3%) | 22 (5.5%) | 9 (2.3%) | 2 (0.5%) |
| Women develop cervical cancer due to unhealthy sexual habits. | 51 (12.8%) | 104 (26%) | 113 (28.2%) | 73 (18.3%) | 59 (14.8%) |

| | | | | | |
|--|-------------|-------------|------------|-----------|----------|
| One should keep a social distance from women with cervical cancer. | 143 (35.8%) | 143 (35.8%) | 94 (23.5%) | 17 (4.3%) | 3 (0.8%) |
| I am willing to pay to get vaccinated. | 20 (5%) | 52 (13%) | 164 (41%) | 120 (30%) | 44 (11%) |

Table 4. Education in association with knowledge, history, and awareness regarding HPV (n=400).

| Parameter | | Educational level | | | | P-value |
|--|-------------------|-------------------|-----------|---------------|--------------|---------|
| | | High school | Diploma | Undergraduate | Postgraduate | |
| Have you ever heard of a PAP test? | No | 66 (42.6%) | 3 (1.9%) | 79 (51%) | 7 (4.5%) | 0.000 |
| | Yes | 41 (16.7%) | 7 (2.9%) | 177 (72.2%) | 20 (8.2%) | |
| Have you ever heard of the HPV vaccine? | No | 81 (32.1%) | 5 (2%) | 159 (63.1%) | 7 (2.8%) | 0.000 |
| | Yes | 26 (17.6%) | 5 (3.4%) | 97 (65.5%) | 20 (13.5%) | |
| Ever received the HPV vaccine? | No | 103 (26.3%) | 10 (2.6%) | 251 (64.2%) | 27 (6.9%) | 0.566 |
| | Yes | 4 (44.4%) | 0 (0%) | 5 (55.6%) | 0 (0%) | |
| Have you ever been diagnosed with HPV? | No | 104 (26.3%) | 10 (2.5%) | 256 (64.6%) | 26 (6.6%) | 0.042 |
| | Yes | 3 (75%) | 0 (0%) | 0 (0%) | 1 (25%) | |
| I believe I am old for a cervical cancer screening? | Strongly Disagree | 12 (17.6%) | 4 (5.9%) | 42 (61.8%) | 10 (14.7%) | 0.001 |
| | Disagree | 33 (20.4%) | 1 (0.6%) | 117 (72.2%) | 11 (6.8%) | |
| | Neutral | 42 (33.1%) | 4 (3.1%) | 75 (59.1%) | 6 (4.7%) | |
| | Agree | 15 (44.1%) | 1 (2.9%) | 18 (52.9%) | 0 (0%) | |
| | Strongly agree | 5 (55.6%) | 0 (0%) | 4 (44.4%) | 0 (0%) | |
| I feel embarrassed about a cervical cancer screening. | Strongly Disagree | 14 (15.9%) | 4 (4.5%) | 60 (68.2%) | 10 (11.4%) | 0.003 |
| | Disagree | 46 (29.7%) | 3 (1.9%) | 99 (63.9%) | 7 (4.5%) | |
| | Neutral | 14 (17.9%) | 1 (1.3%) | 54 (69.2%) | 9 (11.5%) | |
| | Agree | 21 (36.8%) | 2 (3.5%) | 33 (57.9%) | 1 (1.8%) | |
| | Strongly agree | 12 (54.5%) | 0 (0%) | 10 (45.5%) | 0 (0%) | |
| Do not want to expose myself to the doctor? | Strongly Disagree | 18 (19.8%) | 4 (4.4%) | 61 (67%) | 8 (8.8%) | 0.000 |
| | Disagree | 41 (27.7%) | 2 (1.4%) | 100 (67.6%) | 5 (3.4%) | |
| | Neutral | 19 (21.8%) | 0 (0%) | 54 (62.1%) | 14 (16.1%) | |
| | Agree | 20 (36.4%) | 4 (7.3%) | 31 (56.4%) | 0 (0%) | |
| | Strongly agree | 9 (47.4%) | 0 (0%) | 10 (52.6%) | 0 (0%) | |
| Healthy women do not need cervical cancer screening. | Strongly Disagree | 13 (16.3%) | 1 (1.3%) | 54 (67.5%) | 12 (15%) | 0.009 |
| | Disagree | 42 (23.7%) | 6 (3.4%) | 122 (68.9%) | 7 (4%) | |
| | Neutral | 31 (35.2%) | 3 (3.4%) | 50 (56.8%) | 4 (4.5%) | |
| | Agree | 15 (36.6%) | 0 (0%) | 24 (58.5%) | 2 (4.9%) | |
| | Strongly agree | 6 (42.9%) | 0 (0%) | 6 (42.9%) | 2 (14.3%) | |
| Only married women need to have cervical cancer screening. | Strongly Disagree | 12 (15.4%) | 2 (2.6%) | 50 (64.1%) | 14 (17.9%) | 0.001 |
| | Disagree | 40 (24.7%) | 4 (2.5%) | 110 (67.9%) | 8 (4.9%) | |
| | Neutral | 19 (25%) | 3 (3.9%) | 51 (67.1%) | 3 (3.9%) | |
| | Agree | 31 (43.7%) | 1 (1.4%) | 37 (52.1%) | 2 (2.8%) | |
| | Strongly agree | 5 (38.5%) | 0 (0%) | 8 (61.5%) | 0 (0%) | |
| I do not want to know if I have cervical cancer. | Strongly Disagree | 28 (19%) | 4 (2.7%) | 104 (70.7%) | 11 (7.5%) | 0.072 |
| | Disagree | 48 (28.7%) | 4 (2.4%) | 103 (61.7%) | 12 (7.2%) | |

| | | | | | | |
|---|--------------------------|------------|----------|-------------|------------|-------|
| | Neutral | 12 (25%) | 2 (4.2%) | 30 (62.5%) | 4 (8.3%) | |
| | Agree | 13 (44.8%) | 0 (0%) | 16 (55.2%) | 0 (0%) | |
| | Strongly agree | 6 (66.7%) | 0 (0%) | 3 (33.3%) | 0 (0%) | |
| HPV vaccine is only for married women? | Strongly Disagree | 15 (17.2%) | 3 (3.4%) | 54 (62.1%) | 15 (17.2%) | 0.000 |
| | Disagree | 33 (22.6%) | 3 (2.1%) | 102 (69.9%) | 8 (5.5%) | |
| | Neutral | 39 (31.5%) | 2 (1.6%) | 80 (64.5%) | 3 (2.4%) | |
| | Agree | 18 (48.6%) | 2 (5.4%) | 16 (43.2%) | 1 (2.7%) | |
| | Strongly agree | 2 (33.3%) | 0 (0%) | 4 (66.7%) | 0 (0%) | |
| HPV vaccine can cure cervical cancer? | Strongly Disagree | 3 (10.3%) | 2 (6.9%) | 19 (65.5%) | 5 (17.2%) | 0.020 |
| | Disagree | 17 (27.4%) | 0 (0%) | 43 (69.4%) | 2 (3.2%) | |
| | Neutral | 48 (25.1%) | 2 (1%) | 130 (68.1%) | 11 (5.8%) | |
| | Agree | 27 (32.1%) | 4 (4.8%) | 45 (53.6%) | 8 (9.5%) | |
| | Strongly agree | 12 (35.3%) | 2 (5.9%) | 19 (55.9%) | 1 (2.9%) | |
| Women are responsible for causing cervical cancer? | Strongly Disagree | 10 (12.7%) | 2 (2.5%) | 56 (70.9%) | 11 (13.9%) | 0.011 |
| | Disagree | 35 (27.6%) | 3 (2.4%) | 81 (63.8%) | 8 (6.3%) | |
| | Neutral | 41 (29.1%) | 4 (2.8%) | 92 (65.2%) | 4 (2.8%) | |
| | Agree | 17 (47.2%) | 0 (0%) | 16 (44.4%) | 3 (8.3%) | |
| | Strongly agree | 4 (23.5%) | 1 (5.9%) | 11 (64.7%) | 1 (5.9%) | |
| Women with cervical cancer give me a feeling of dirtiness. | Strongly Disagree | 38 (17.1%) | 6 (2.7%) | 163 (73.4%) | 15 (6.8%) | 0.000 |
| | Disagree | 55 (37.9%) | 2 (1.4%) | 81 (55.9%) | 7 (4.8%) | |
| | Neutral | 9 (40.9%) | 2 (9.1%) | 8 (36.4%) | 3 (13.6%) | |
| | Agree | 4 (44.4%) | 0 (0%) | 3 (33.3%) | 2 (22.2%) | |
| | Strongly agree | 1 (50%) | 0 (0%) | 1 (50%) | 0 (0%) | |
| Women develop cervical cancer due to unhealthy sexual habits. | Strongly Disagree | 6 (11.8%) | 1 (2%) | 41 (80.4%) | 3 (5.9%) | 0.261 |
| | Disagree | 26 (25%) | 3 (2.9%) | 69 (66.3%) | 6 (5.8%) | |
| | Neutral | 32 (28.3%) | 4 (3.5%) | 72 (63.7%) | 5 (4.4%) | |
| | Agree | 25 (34.2%) | 1 (1.4%) | 41 (56.2%) | 6 (8.2%) | |
| | Strongly agree | 18 (30.5%) | 1 (1.7%) | 33 (55.9%) | 7 (11.9%) | |
| One should keep a social distance from women with cervical cancer. | Strongly Disagree | 29 (20.3%) | 1 (0.7%) | 97 (67.8%) | 16 (11.2%) | 0.006 |
| | Disagree | 38 (26.6%) | 5 (3.5%) | 96 (67.1%) | 4 (2.8%) | |
| | Neutral | 28 (29.8%) | 4 (4.3%) | 57 (60.6%) | 5 (5.3%) | |
| | Agree | 10 (58.8%) | 0 (0%) | 5 (29.4%) | 2 (11.8%) | |
| | Strongly agree | 2 (66.7%) | 0 (0%) | 1 (33.3%) | 0 (0%) | |
| I am willing to pay to get vaccinated. | Strongly Disagree | 5 (25%) | 2 (10%) | 10 (50%) | 3 (15%) | 0.317 |
| | Disagree | 16 (30.8%) | 0 (0%) | 33 (63.5%) | 3 (5.8%) | |
| | Neutral | 40 (24.4%) | 5 (3%) | 111 (67.7%) | 8 (4.9%) | |
| | Agree | 36 (30%) | 2 (1.7%) | 71 (59.2%) | 11 (9.2%) | |
| | Strongly agree | 10 (22.7%) | 1 (2.3%) | 31 (70.5%) | 2 (4.5%) | |

Human papillomavirus (HPV) is a sexually transmitted infection that is a leading cause of cervical cancer worldwide [21]. Although there is an effective vaccine available for prevention, many women are not aware of the importance of regular screening and vaccination [22, 23]. This study aimed to explore the levels of awareness

and knowledge of HPV vaccination and screening and its relation to cervical cancer among the patients attending King Saud Medical City in Riyadh. The study also aims to examine the gender differences, socioeconomic status, stigmas, and misconceptions associated with the HPV vaccine and cervical cancer.

In the present study, only 37% of participants had heard of the HPV vaccine. Another study conducted in Bangladesh, aimed to assess overall Bangladeshi public information, about the human papillomavirus and its vaccine, showed that 43.29% of the respondents were knowledgeable enough about HPV infections and their vaccination [24]. Another study conducted on the Iranian population investigate the quality of information about HPV contagion and its vaccination in the Iranian population. The knowledge was poor; however, the attitude toward HPV infection and its vaccination were positive and strong [25].

The results of this study showed that 41% of participants were willing to pay to get vaccinated, which is an encouraging finding, but only 2.3% had received it. Another study in Bahrain study showed positive attitudes toward getting HPV immunization, however, there is restricted information about HPV and its health implications [26].

The results of this study showed a significant association between education level and knowledge, history, and awareness of HPV among women. Women with higher levels of education were more likely to have heard of PAP tests, and HPV vaccines, and to have received the HPV vaccine. They were also less likely to believe that they were too old for cervical cancer screening or to feel embarrassed about it. In contrast, women with lower levels of education were more likely to have never heard of PAP tests or the HPV vaccine and to feel embarrassed or uncomfortable about cervical cancer screening. These findings are consistent with previous research that has shown a relationship between education level and health literacy.

The findings of the current study are consistent with those of previous studies conducted in developing countries such as Ghana and India [27-29], where the lack of national screening programs and stigmatization among women were identified as barriers to cervical cancer screening. Similarly, in our study, a significant number of participants had misconceptions and lacked knowledge regarding cervical cancer screening and the HPV vaccine, suggesting that these issues may be universal and require targeted interventions to improve awareness and increase uptake.

In comparison, Grigore *et al.* explored the awareness level of HPV and cervical cancer among women in Romania with a total of 214 participants. They reported that overall, most of the participants had good awareness levels regardless of their educational program. This was contributed to the fact that Romania has a vaccination campaign organized by the Ministry of Health of Romania [30]. However, the same study showed that the knowledge of vaccination and its importance was low, despite having good awareness about the topic. Around 68% of them did not know the age recommendation on which the vaccination and screening should be carried out [30]. In the Middle East and North Africa, the incidence of HPV and cervical carcinoma is lower than in the rest of the world due to cultural and religious factors [31]. However, as generations are changing and more liberal practices are being accepted among them, it is important to address important health topics. In the Middle East, the United Arab Emirates (UAE) is the only one that implemented a national vaccination program and showed a very high rate of absorption of the program by 77% [31]. Nonetheless, Rihab conducted a systematic review of the knowledge, awareness, and acceptability of anti- HPV vaccine [31].

The findings of this study have several implications for public health interventions aimed at promoting cervical cancer prevention. First, the results suggest that interventions to increase knowledge and awareness of HPV should target women with lower levels of education. These women may be less likely to have access to accurate health information, or they may lack the skills to understand and interpret health-related information. Interventions that use clear and simple language and that are tailored to the needs and preferences of this population may be more effective.

Second, the results highlight the importance of addressing the social and cultural factors that may influence attitudes toward cervical cancer screening. Women with lower levels of education may be more likely to hold beliefs that are based on misconceptions or myths about cervical cancer screening, such as the belief that healthy women do not need screening. They may also face barriers to accessing healthcare, such as financial constraints or lack of transportation. Interventions that address these social and cultural factors may be more effective in promoting cervical cancer prevention among women with lower levels of education.

Third, the results suggest that healthcare providers play a critical role in promoting cervical cancer prevention among women. Women who have never heard of PAP tests or the HPV vaccine may be more likely to seek information and advice from healthcare providers. Healthcare providers can use this opportunity to provide accurate and comprehensive information about HPV, the importance of regular screening and vaccination, and the potential risks and benefits of these interventions. They can also address any misconceptions or concerns that

women may have about cervical cancer screening and provide support and guidance to help women overcome any barriers to accessing healthcare.

Fourth, the results highlight the need for continued efforts to promote HPV vaccination among women. Although the HPV vaccine is highly effective in preventing cervical cancer, uptake of the vaccine remains low in many countries, including the United States. Women with higher levels of education were more likely to have received the vaccine, suggesting that interventions to promote vaccination should target women with lower levels of education. These interventions should address the barriers to accessing healthcare, such as financial constraints or lack of transportation, that may prevent women from receiving the vaccine.

Limitations

Several limitations to this study should be considered when interpreting the results. First, the study sample was limited to women in a single geographic region, which may limit the generalizability of the findings to other populations. Second, the study relied on self-reported data, which may be subject to recall bias or social desirability bias. Third, the study did not collect information about other factors that may influence knowledge and awareness of HPV, such as social support or access to health information. Future research should address these limitations to provide a more comprehensive understanding of the factors that influence cervical cancer prevention among women.

CONCLUSION

The present cross-sectional study aimed to assess the knowledge, attitude, and awareness of King Saud Medical City attendees regarding cervical cancer and the HPV vaccine. The results of the study showed that while the majority of the participants had heard of a PAP test, only 37% had heard of the HPV vaccine. Additionally, a significant number of participants had misconceptions regarding cervical cancer screening and the HPV vaccine, indicating the need for education campaigns in this regard. The study also found a statistically significant association between education level and knowledge of PAP tests and the HPV vaccine. The study's findings could help healthcare providers in Saudi Arabia develop strategies to improve awareness of cervical cancer and HPV vaccination and reduce the incidence of cervical cancer.

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CONFLICT OF INTEREST : None

FINANCIAL SUPPORT : None

ETHICS STATEMENT : The research team obtained ethical approval from the King Saud Medical City Research Ethics Committee before conducting the study. The research team then obtained permission from the hospital administration to conduct the study in the hospital.

REFERENCES

1. Rančić NK, Golubović MB, Ilić MV, Ignjatović AS, Živadinović RM, Đenić SN, et al. Knowledge about Cervical Cancer and Awareness of Human Papillomavirus (HPV) and HPV Vaccine among Female Students from Serbia. *Medicina (Kaunas)*. 2020;56(8):406.
2. Fawzy A, Alqelaiti YA, Almatrafi MM, Almatrafi OM, Alqelaiti EA. Common Sensitive Prognostic Markers in Breast Cancer and their Clinical Significance: A Review Article. *Arch Pharm Pract*. 2022;13(1):40-5.
3. Lalthanpuui K, Kaur J, Saini S, Bhatti K, Nain P. Strengthen the Monitoring and Reporting of Adverse Drug Reaction at a Tertiary Teaching Hospital. *Arch Pharm Pract*. 2022;13(1):61-7.
4. Aloufi BH. Structure-based Multi-targeted Molecular Docking and Molecular Dynamic Simulation Analysis to Identify Potential Inhibitors against Ovarian Cancer. *J Biochem Technol*. 2022;13(2):29-39.
5. Bruni L, Barrionuevo-Rosas L, Albero G, Serrano B, Mena M, Gómez D. Human papillomavirus and related diseases in the world. Summary report. ICO/ IARC Inf Cent HPV Cancer (HPV Inf Centre). 2019;307.

6. Aghbash PS, Hemmat N, Fathi H, Baghi HB. Monoclonal antibodies in cervical malignancy-related HPV. *Front Oncol.* 2022;12:904790. doi:10.3389/fonc.2022.904790
7. Abubaker SA, Abdelwadoud ME, Ali MM, Ahmad HA, Khlafalla AM, Elmahi OM, et al. Immunohistochemical Expression of Oestrogen and Epidermal Growth Factor Receptors in Endometrial Cancerous in Sudanese Patients. *J Biochem Technol.* 2021;12(1):58-62.
8. Coppola R, Santo B, Ramella S, Panasiti V. Novel skin toxicity of epidermal growth factor receptor inhibitors: A case of intertrigo-like eruption in a patient with metastatic colorectal cancer treated with cetuximab. *Clin Cancer Investig J.* 2021;10(2):91-2.
9. Chu D, Liu T, Yao Y. Implications of viral infections and oncogenesis in uterine cervical carcinoma etiology and pathogenesis. *Front Microbiol.* 2023;14:1194431. doi:10.3389/fmicb.2023.1194431
10. Abebe M, Eshetie S, Tessema B. Prevalence of sexually transmitted infections among cervical cancer suspected women at University of Gondar Comprehensive Specialized Hospital, North-west Ethiopia. *BMC Infect Dis.* 2021;21(1):378. doi:10.1186/s12879-021-06074-y
11. Zhao Z, Deng S, Wang Q, Jia C, Yang J. Novel Insight into Blocking Cancer Metastasis by Biological Nano Confinement through Altering the Cancer Microenvironment. *Clin Cancer Investig J.* 2022;11(4):10-4.
12. Sahebzadeh M, Khuzani HR, Keyvanara M, Tabesh E. Explaining the Factors Shaping Two Different Beliefs about Cancer in Iran Based on Causal Layer Analysis “CLA”. *Entomol Appl Sci Lett.* 2021;8(2):42-50.
13. Ali MAM, Bedair RN, Abd El Atti RM. Cervical high-risk human papillomavirus infection among women residing in the Gulf Cooperation Council countries: Prevalence, type-specific distribution, and correlation with cervical cytology. *Cancer Cytopathol.* 2019;127(9):567-77. doi:10.1002/cncy.22165
14. Alkhayyat S, Khojah M, AlJehan M, Allali D, Tayeb A, Albukhari S, et al. Awareness of colorectal cancer in Saudi Arabia: cross-sectional study. *Pharmacophore.* 2021;12(1):38-43.
15. El Hadad S, Al Rowily E, Aldahlawi A, Alrahimi J, Hassoubah S. The Role of P53 and K-Ras in Regulating Spleen Innate Mediators In Mice With Colon Cancer. *Pharmacophore.* 2021;12(4):19-27.
16. Elsbali AM. Human papillomavirus: present and future perspective in Saudi Arabia. *J Obstet Gynaecol.* 2021;41(4):497-502. doi:10.1080/01443615.2020.1737662
17. Mekeres GM, Buhaş CL, Csep AN, Beiuşanu C, Andreescu G, Marian P, et al. The Importance of Psychometric and Physical Scales for the Evaluation of the Consequences of Scars—A Literature Review. *Clin Pract.* 2023;13(2):372-83.
18. Csep A, Vaida LL, Negruţiu BM, Todor BI, Judea-Pusta CT, Buhaş C, et al. Research on demographic, clinical and paraclinical aspects in pregnant women infected with *Toxoplasma gondii*. *Exp Ther Med.* 2022;23(2):1-7.
19. Effah K, Tekpor E, Wormenor CM, Amuah JE, Essel NO, Atuguba BH, et al. Concurrent HPV DNA testing and a visual inspection method for cervical precancer screening: A practical approach from Battor, Ghana. *PLOS Glob Public Health.* 2023;3(4):e0001830. doi:10.1371/journal.pgph.0001830
20. Andrei CS, Vaida L, Bungau S, Todor BI. Clinical and Biological Correlations in *Toxoplasma gondii* Infection in HIV Immune Suppressed Persons. *Iran J Public Health.* 2015;44(7):1012-3.
21. Muñoz N, Castellsagué X, de González AB, Gissmann L. HPV in the etiology of human cancer. *Vaccine.* 2006;24:S1-0.
22. Stanley M. Immunobiology of HPV and HPV vaccines. *Gynecol Oncol.* 2008;109(2):S15-21.
23. Dunne EF, Park IU. HPV and HPV-associated diseases. *Infect Dis Clin.* 2013;27(4):765-78.
24. Islam JY, Khatun F, Alam A, Sultana F, Bhuiyan A, Alam N, et al. Knowledge of cervical cancer and HPV vaccine in Bangladeshi women: a population-based, cross-sectional study. *BMC Womens Health.* 2018;18(1):15. doi:10.1186/s12905-018-0510-7
25. Taebi M, Riazi H, Keshavarz Z, Afrakhteh M. Knowledge and Attitude Toward Human Papillomavirus and HPV Vaccination in Iranian Population: A Systematic Review. *Asian Pac J Cancer Prev.* 2019;20(7):1945-9. doi:10.31557/APJCP.2019.20.7.1945
26. Husain Y, Alalwan A, Al-Musawi Z, Abdulla G, Hasan K, Jassim G. Knowledge towards human papilloma virus (HPV) infection and attitude towards its vaccine in the Kingdom of Bahrain: cross-sectional study. *BMJ open.* 2019;9(9):e031017. doi:10.1136/bmjopen-2019-031017
27. Taneja N, Chawla B, Awasthi AA, Shrivastav KD, Jaggi VK, Janardhanan R. Knowledge, Attitude, and Practice on Cervical Cancer and Screening Among Women in India: A Review. *Cancer Control.* 2021;28:10732748211010799. doi:10.1177/10732748211010799

28. Ebu NI, Mupepi SC, Siakwa MP, Sampsellem CM. Knowledge, practice, and barriers toward cervical cancer screening in Elmina, Southern Ghana. *Int J Women's Health*. 2015;7:31-9.
29. Singh J, Roy B, Yadav A, Siddiqui S, Setia A, Ramesh R, et al. Cervical cancer awareness and HPV vaccine acceptability among females in Delhi: A cross-sectional study. *Indian J Cancer*. 2018;55(3):233-7.
30. Grigore M, Teleanu SI, Pristavu A, Matei M. Awareness and Knowledge About HPV and HPV Vaccine Among Romanian Women. *J Cancer Educ*. 2018;33(1):154-9.
31. Gamaoun R. Knowledge, awareness and acceptability of anti-HPV vaccine in the Arab states of the Middle East and North Africa Region: a systematic. *EMHJ*. 2018;24(6-2018).