Journal of Neonatal Surgery
ISSN(Online): 2226-0439
Vol. 14, Issue 32s (2025)
https://www.jneonatalsurg.com

OPEN ACCESS

Pap Smear Screening and HPV Vaccination Among Jordanian Women: Sociocultural and Economic Barriers

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Cite this paper as: Nour A. Negresh, Ruba F. Al-Sheyab, Nour Albdaren, We'am Alayasra, Batool Ayasrah, Abdullah Almomani, Ahmad Alkhalaileh, Yaman Alkhdour, Ahmad Khaza'leh, Alaa Al Nsoor, Ameer Al Momani, (2025) Pap Smear Screening and HPV Vaccination Among Jordanian Women: Sociocultural and Economic Barriers. *Journal of Neonatal Surgery*, 14 (32s), 8119-8130.

ABSTRACT

Background: Cervical cancer is the eleventh most frequent cancer among Jordanian women. Around 115 women are diagnosed with cervical cancer, though 71 women die of cervical cancer annually in Jordan. Incorporating pap smear screening into routine gynecological care will contribute to the early detection and prevention of cervical cancer. Screening for cervical cancer should begin at the age of 21 or within three years of becoming sexually active.

Objectives: The study aims to assess the awareness and knowledge of Jordanian married females about the role of pap smear screening in the detection of cervical cancer. This research also aims to discover the barriers that determine the application of Pap smears in Jordan.

Methods: A cross-sectional study will be conducted, involving about 770 married women aged between 22-50 years old in Jordan. Data will be collected for demographic information like age. Various clinical characteristics will be analyzed. Statistical analyses will be performed using R studio (version 2024.09.0) Vienna, Austria.

Results: Although 83.7% of participants had heard of cervical cancer, only 31% had had a Pap smear, and just 7.1% did so regularly. Higher education and income were linked to greater awareness and screening uptake. Cultural barriers like embarrassment (9.9%) and fear of the procedure (8.1%) limited participation, while spousal disapproval was minimal. Awareness of the HPV vaccine was very low (9.9%), and only 1.9% had received it, mainly due to lack of knowledge and fear of side effects. Regional and income disparities also affected screening rates.

Conclusion: The study shows a gap between awareness of cervical cancer and actual screening behavior among Jordanian women. Education, income, and cultural beliefs strongly influence Pap smear uptake. Low awareness and uptake of the HPV vaccine highlight the need for targeted health education and accessible preventive services. Improving provider communication, community outreach and affordability are important to enhancing cervical cancer prevention efforts in Jordan.

Keywords: *cervical cancer, Jordan, pap smear testing, women's health, HPV vaccine*

1. INTRODUCTION

Cervical cancer is one of the most common types of cancer affecting the female reproductive system, causing death of over 250,000 women each year. Its main cause of this disease is well known with over 99% of cases are attributed to infection with high-risk cancer (1). Every year, over 500,000 women are diagnosed with cervical cancer, even though it is preventable. Around 90% of these cases happen in low and middle income countries where screening and HPV vaccination programs are often not available (2). It is mainly caused by HPV type 16. The most common form of this cancer is squamous cell

carcinoma. It develops in four main stages: infection of the metaplastic epithelium in the transformation zone, persistence of the virus, precancerous changes development, and invasion through the basement membrane (3). Women with cervical cancer suffer from moderate to severe fatigue which can lower their quality of life (4). Early and accurate screening approaches are important in managing this disease such as Pap smears, HPV DNA tests, and liquid based cytology (5). HPV testing along with digital colposcopy offer effective ways to detect cervical dysplasia and help lower the risk of developing cervical cancer (6). This disease is highly preventable and widespread use of screening and vaccinations lowered its occurrence and death rates (2). Reducing cervical cancer cases and deaths by improving education and making healthcare more accessible (7). HPV DNA testing is considered the most effective and cost effective (8). The eradication of cervical cancer relies on early detection and addressing the obstacles that delay timely diagnosis (9). The Pap smear test has low sensitivity but high specificity when it comes to identifying precancerous and cancerous changes in the cervix. On the other hand, cervical biopsy is the gold standard for diagnosis (10). Some studies suggested that screening should begin 3-5 years after marriage (11). For patients with locally advanced cervical cancer, performing surgery after chemoradiotherapy or neoadjuvant chemotherapy may enhance both disease control and survival (12).

This study aims to assess the level of awareness, knowledge, and attitudes among married women in Jordan regarding cervical cancer and the role of Pap smear screening in its early detection. It also aims to identify key barriers that limit the use of Pap smears in this population.

2. METHODS AND MATERIALS

Study Design

This study is a descriptive cross-sectional analysis aimed at assessing knowledge, attitudes, and practices related to cervical cancer screening among women in Jordan. It was conducted in secondary healthcare facilities across various Jordanian cities between September 2024 and January 2025. A self-administered, coded, and close-ended questionnaire was used to collect data.

Data Collection

Participants were selected randomly, and the questionnaire included items covering sociodemographic details, awareness of Pap smear screening, and barriers to cervical cancer prevention. Prior to the main distribution, pilot testing was conducted to assess the reliability of the questionnaire, and the preliminary results were analyzed using SPSS. All responses were anonymous and voluntary.

Ethical Consideration

This study approval was waived by the Institutional Review Board (IRB) committee at the Faculty of Medicine, Al-Balqa Applied University (ref: **8125/18/3/2/18**). All participants will be informed about the study's purpose and assured of their privacy and the confidentiality of the data collected. This study was conducted in accordance with the declaration of Helsinki 1964.

Statistical Analysis

Data were analyzed using R Studio (version 2024.09.0, Vienna, Austria). Categorical variables were summarized as frequencies and percentages, while continuous variables were reported as means with standard deviations. Group comparisons were conducted based on participants' cervical smear test status (Yes vs. No). Pearson's Chi-squared test or Fisher's exact test was used for categorical variables, and the Wilcoxon rank-sum test was used for continuous variables, depending on data distribution and cell counts. A p-value of less than 0.05 was considered statistically significant. Descriptive and comparative summaries were generated using the gtsummary package in R, with tables presenting overall statistics, group-wise distributions, and associated p-values.

3. RESULTS

The final dataset included 1,077 married women aged 22 to over 50 years. Most participants were between 31–50 years old (56%) and resided in the middle (53%) or northern (32%) regions of Jordan. A majority were married (91%) and employed (50%), with the most common occupations in the "other" job category. More than half held at least a bachelor's degree (53%), and 90% reported a monthly income below 1,000 JD. Only 29.2% of participants had ever undergone a cervical smear test, and just 6.6% did so regularly (Table 1).

Participants who reported having a Pap smear were older on average, with 33% being above 50 years compared to 18% in the unscreened group. A higher proportion were married (97% vs. 88%), employed (57% vs. 47%), and lived in the middle region (59% vs. 50%). Women with higher income (≥1,000 JD) comprised 17% of the screened group versus only 6.4% in the unscreened group. Bachelor's and postgraduate degrees were more frequent among screened women (53% and 20%, respectively) than those unscreened (52% and 14%, respectively) (Table 1).

Table 1: Demographics and Socioeconomic Characteristics by cervical smear test status				
Characteristic	**Yes** N = 314[1]	**No** N = 763[1]	**p-value**[2]	**Overall** N = 1,077[1]
Age			<0.001	
22-30	27 (8.6%)	166 (22%)		193 (18%)
31-40	66 (21%)	200 (26%)		266 (25%)
41-50	114 (36%)	219 (29%)		333 (31%)
Less Than 22	4 (1.3%)	44 (5.8%)		48 (4.5%)
More Than 50	103 (33%)	134 (18%)		237 (22%)
Marriage Age			0.7	
Mean ± SD	25 ± 11	25 ± 10		25 ± 10
Marital status			<0.001	
Married	293 (97%)	652 (88%)		945 (91%)
Single	8 (2.7%)	90 (12%)		98 (9.4%)
Residency			<0.001	
Middle	185 (59%)	384 (50%)		569 (53%)
North	103 (33%)	238 (31%)		341 (32%)
South	26 (8.3%)	141 (18%)		167 (16%)
Educational level			0.012	
Bachelor's	166 (53%)	400 (52%)		566 (53%)
Diploma	44 (14%)	112 (15%)		156 (14%)
High school	41 (13%)	147 (19%)		188 (17%)
Postgraduate studies	63 (20%)	104 (14%)		167 (16%)
Monthly Income				
<500	140 (45%)	501 (66%)		641 (60%)
<501	0 (0%)	1 (0.1%)		1 (<0.1%)
=>2000	9 (2.9%)	11 (1.4%)		20 (1.9%)
1000-1499	32 (10%)	27 (3.5%)		59 (5.5%)
1500-1999	13 (4.2%)	11 (1.4%)		24 (2.2%)
500-999	119 (38%)	211 (28%)		330 (31%)
Salary Grouping			<0.001	
<=1000	259 (83%)	713 (94%)		972 (90%)
>=1000	54 (17%)	49 (6.4%)		103 (9.6%)
Are you an employee?			0.001	
No	134 (43%)	408 (53%)		542 (50%)
Yes	180 (57%)	355 (47%)		535 (50%)

If your answer to the previous question is Yes, what is your job?			0.092	
Medical Sector	15 (6.6%)	40 (7.8%)		55 (7.4%)
Other	203 (89%)	465 (91%)		668 (90%)
Physician	1 (0.4%)	0 (0%)		1 (0.1%)
Teacher	8 (3.5%)	7 (1.4%)		15 (2.0%)
[1] n (%)				
[2] Pearson's Chi-squared test; Wilcoxon rank sum test; Fisher's exact test				

Regarding reproductive and medical history, screened women were more likely to have five or more pregnancies (42% vs. 29%) and fewer nulliparous participants (2.2% vs. 14%). They were also more likely to have undergone surgical removal procedures (23% vs. 14%) and report a history of chronic or hereditary disease (27% vs. 20%). A family history of any cancer was reported by 43% of screened women versus 36% in the unscreened group, while the prevalence of cervical cancer family history remained low in both groups (Table 2).

Table 2: Medical and Family History by cervical smear test status

Characteristic	**Yes** N = 314[1]	**No** N = 763[1]	**p-value**[2]	**Overall** N = 1,077[1]
Number of pregnancies ?			<0.001	
=>5	131 (42%)	220 (29%)		351 (33%)
0	7 (2.2%)	107 (14%)		114 (11%)
1	15 (4.8%)	75 (9.8%)		90 (8.4%)
2	29 (9.2%)	93 (12%)		122 (11%)
3	59 (19%)	111 (15%)		170 (16%)
4	73 (23%)	157 (21%)		230 (21%)
How many miscarriages?				
=>5	5 (1.6%)	11 (1.4%)		16 (1.5%)
0	165 (53%)	459 (60%)		624 (58%)
1	75 (24%)	163 (21%)		238 (22%)
2	50 (16%)	79 (10%)		129 (12%)
3	14 (4.5%)	31 (4.1%)		45 (4.2%)
4	5 (1.6%)	20 (2.6%)		25 (2.3%)
Have you received all vaccinations?				
Yes	1 (100%)	0 (NA%)		1 (100%)
Do you have a history of any chronic or hereditary disease?			0.005	
No	228 (73%)	614 (80%)		842 (78%)
Yes	86 (27%)	149 (20%)		235 (22%)
If your answer is Yes to the previous question, please state it.			0.2	

Diabetes	0 (0%)	3 (60%)		3 (38%)
HTN and Diabetes	1 (33%)	0 (0%)		1 (13%)
hypothyroidism	0 (0%)	1 (20%)		1 (13%)
irritable bowel syndrome	1 (33%)	0 (0%)		1 (13%)
thyroid gland	0 (0%)	1 (20%)		1 (13%)
Uterine enlargement, fibroids, and bleeding	1 (33%)	0 (0%)		1 (13%)
Do you have a history of any type of cancer?			0.2	
No	300 (96%)	741 (97%)		1,041 (97%)
Yes	14 (4.5%)	22 (2.9%)		36 (3.3%)
Do you have a history of cervical cancer?			0.090	
No	307 (98%)	758 (99%)		1,065 (99%)
Yes	6 (1.9%)	5 (0.7%)		11 (1.0%)
Have you had any surgical removal procedures before?			<0.001	
No	242 (77%)	654 (86%)		896 (83%)
Yes	72 (23%)	109 (14%)		181 (17%)
If your answer is Yes, please state which year.			>0.9	
..	0 (0%)	1 (20%)		1 (14%)
appendix	0 (0%)	1 (20%)		1 (14%)
Gallbladder removal 1999	1 (50%)	0 (0%)		1 (14%)
Gallbladder removal 2024	0 (0%)	1 (20%)		1 (14%)
Ovarian cyst 2023	0 (0%)	1 (20%)		1 (14%)
pelvic organ prolapse surgery	1 (50%)	0 (0%)		1 (14%)
thyroid gland 1998	0 (0%)	1 (20%)		1 (14%)
Do you have a family history of any type of cancer? First-degree and second-degree relatives.			0.024	
No	177 (57%)	489 (64%)		666 (62%)
Yes	135 (43%)	274 (36%)		409 (38%)
Do you have a family history of cervical cancer?First-degree and second-degree relatives.			0.6	
No	300 (96%)	734 (96%)		1,034 (96%)
Yes	14 (4.5%)	29 (3.8%)		43 (4.0%)
Are you undergoing radiation therapy in the pelvic area?			0.11	
No	297 (99%)	739 (100%)		1,036 (99%)
Yes	4 (1.3%)	3 (0.4%)		7 (0.7%)

[1] n (%)

[2] Pearson's Chi-squared test; Fisher's exact test

Knowledge and awareness were markedly higher among screened women. While 93% of those screened had heard of cervical cancer, only 78% of the unscreened group had. Awareness of the term "Pap smear" was also higher (94% vs. 42%), as was the ability to differentiate it from a vaginal smear (60% vs. 25%). Screened participants reported greater awareness of symptoms (mean 2.65 vs. 2.09) and risk factors (mean 2.67 vs. 2.20). Among the screened, 21% underwent regular Pap testing, compared to just 0.7% in the unscreened group (Table 3).

Table 3: Knowledge, Attitudes, and Practices (KAP) by cervical smear test status

Characteristic	**Yes** N = 314[1]	**No** N = 763[1]	**p-value**[2]	**Overall** N = 1,077[1]
Have you ever heard of cervical cancer?			<0.001	
No	22 (7.0%)	170 (22%)		192 (18%)
Yes	292 (93%)	593 (78%)		885 (82%)
Have you ever worried about the possibility of developing cervical cancer?			<0.001	
No	166 (53%)	542 (71%)		708 (66%)
Yes	148 (47%)	220 (29%)		368 (34%)
If 5 represents the highest level and 1 represents the lowest, how would you rate your knowledge and awareness of the symptoms and signs of cervical cancer?			<0.001	
Mean ± SD	2.65 ± 1.18	2.09 ± 1.08		2.26 ± 1.14
If 5 represents the highest level and 1 the lowest, how would you rate your knowledge of the causes and risk factors for cervical cancer?			<0.001	
Mean ± SD	2.67 ± 1.28	2.20 ± 1.18		2.34 ± 1.23
Do you know what a cervical smear is?			<0.001	
No	20 (6.4%)	445 (58%)		465 (43%)
Yes	294 (94%)	318 (42%)		612 (57%)
Do you know the difference between a cervical smear and a vaginal smear?			<0.001	
No	127 (40%)	575 (75%)		702 (65%)
Yes	187 (60%)	188 (25%)		375 (35%)
Have you ever had any tests done at a gynecology clinic other than a Pap smear?			<0.001	
No	73 (23%)	433 (57%)		506 (47%)
Yes	241 (77%)	330 (43%)		571 (53%)

If your answer is Yes to the previous question,what did you do?			<0.001	
Breast examination	1 (0.7%)	0 (0%)		1 (0.2%)
Cauterization of the uterus	1 (0.7%)	0 (0%)		1 (0.2%)
cervical smear	1 (0.7%)	0 (0%)		1 (0.2%)
Endometrial thickness	0 (0%)	2 (0.5%)		2 (0.4%)
IUD examination	2 (1.4%)	0 (0%)		2 (0.4%)
Other	118 (84%)	350 (96%)		468 (92%)
Pap smears, biopsies, and removal of polyps from the uterus, as well as fibroids and a mass from the cervix.	1 (0.7%)	0 (0%)		1 (0.2%)
Pregnancy follow-up	0 (0%)	1 (0.3%)		1 (0.2%)
prolapse	0 (0%)	1 (0.3%)		1 (0.2%)
Test for vaginal infections	0 (0%)	1 (0.3%)		1 (0.2%)
Total hysterectomy	17 (12%)	11 (3.0%)		28 (5.5%)
Do you have a cervical smear test regularly?			<0.001	
No	248 (79%)	758 (99%)		1,006 (93%)
Yes	66 (21%)	5 (0.7%)		71 (6.6%)
1 n (%)				
2 Pearson’s Chi-squared test; Wilcoxon rank sum test; Fisher’s exact test				

As for perceived barriers, unscreened women reported greater lack of knowledge about the importance of screening (mean score 2.46 vs. 2.02), cost-related concerns (2.27 vs. 2.05), and fear of pain or complications (2.50 vs. 2.18). Shyness and spousal disapproval were less commonly reported, with similar average scores across both groups. HPV awareness was low overall, though slightly higher in the screened group (14% vs. 10%). Only 2.3% of all participants had received the vaccine, with lack of knowledge (47%) and fear of side effects (31%) being the most cited barriers (Table 4).

Table 4: Barriers to Screening and HPV Vaccination by cervical smear test status

Characteristic	**Yes** N = 314[1]	**No** N = 763[1]	**p-value**[2]	**Overall** N = 1,077[1]
If 5 represents the greatest barrier and 1 represents the least impact on your ability to undergo the screening, please answer the following questions: [Your fear of the test results].			>0.9	
Mean ± SD	2.21 ± 1.29	2.22 ± 1.32		2.21 ± 1.31
If 5 represents the greatest barrier and 1 represents the least impact on your ability to undergo the screening. [Your lack of knowledge about the importance of the screening].			<0.001	
Mean ± SD	2.02 ± 1.11	2.46 ± 1.33		2.33 ± 1.28
If 5 represents the greatest barrier and 1 represents the least impact on your ability to undergo the			0.014	

screening.Please answer the following questions: [The cost of the screening].				
Mean ± SD	2.05 ± 1.26	2.27 ± 1.32		2.20 ± 1.31
If 5 represents the greatest barrier and 1 represents the least impact on your ability to undergo the screening.Please answer the following questions: [Pain and complications of the screening].			<0.001	
Mean ± SD	2.18 ± 1.26	2.50 ± 1.37		2.41 ± 1.34
If 5 represents the greatest barrier and 1 represents the least impact on your ability to undergo the screening. Please answer the following questions: [Husband's acceptance]			0.2	
Mean ± SD	1.82 ± 1.20	1.91 ± 1.22		1.89 ± 1.22
If 5 represents the greatest barrier and 1 represents the least impact on your ability to undergo the screening. Please answer the following questions: [Shyness about undergoing the screening].			0.064	
Mean ± SD	2.20 ± 1.41	2.37 ± 1.43		2.32 ± 1.43
Have you ever heard of the HPV (Human Papillomavirus) vaccines?			0.086	
No	270 (86%)	684 (90%)		954 (89%)
Yes	44 (14%)	79 (10%)		123 (11%)
Have you ever received the HPV (Human Papillomavirus) vaccine?			0.10	
No	303 (96%)	749 (98%)		1,052 (98%)
Yes	11 (3.5%)	14 (1.8%)		25 (2.3%)
My lack of knowledge about the importance of the vaccine prevents me from receiving it			0.8	
Never	76 (24%)	187 (25%)		263 (24%)
Not Sure	84 (27%)	220 (29%)		304 (28%)
Yes	153 (49%)	356 (47%)		509 (47%)
My fear of the vaccine's side effects is the main reason I haven't received it			0.6	
Never	103 (33%)	272 (36%)		375 (35%)
Not Sure	112 (36%)	253 (33%)		365 (34%)
Yes	98 (31%)	237 (31%)		335 (31%)
The unavailability of the vaccine prevents me from receiving it			0.078	
Never	113 (36%)	309 (41%)		422 (39%)
Not Sure	124 (40%)	313 (41%)		437 (41%)
Yes	76 (24%)	140 (18%)		216 (20%)

The cost of the vaccine prevents me from receiving it			0.7	
Never	146 (47%)	346 (45%)		492 (46%)
Not Sure	120 (38%)	284 (37%)		404 (38%)
Yes	47 (15%)	131 (17%)		178 (17%)
My husband's refusal prevents me from receiving the vaccine			0.2	
Never	206 (66%)	465 (61%)		671 (62%)
Not Sure	83 (27%)	213 (28%)		296 (28%)
Yes	24 (7.7%)	84 (11%)		108 (10%)
[1] n (%)				
[2] Wilcoxon rank sum test; Pearson's Chi-squared test				

4. DISCUSSION

Cervical cancer continues to pose a considerable public health challenge, particularly in low-resource settings (13) . Nevertheless, the implementation of widespread HPV vaccination and regular screening programs holds promise for reducing its incidence in the coming years. Human papillomavirus, especially type 16, is well established as the leading cause of cervical cancer (14) . In many high-income countries, the integration of cytology-based screening, HPV testing, and vaccination initiatives has significantly decreased the disease burden(15) . In this context, our study aimed to assess the knowledge, attitudes, and practices of married women in Jordan concerning Pap smear screening. The findings highlight important sociodemographic and cultural influences that play a role in shaping women's participation in cervical cancer prevention efforts.

This study highlights a strong association between cervical cancer knowledge and screening behavior among married Jordanian women. Those who had undergone Pap smear testing were significantly more informed—both in general awareness and specific understanding of the Pap smear and its role in cancer prevention. Awareness of symptoms, risk factors, and ability to distinguish a Pap smear from other tests were all higher in this group.

Despite this, regular screening was low even among those previously screened (21%), and nearly absent in the unscreened group (0.7%), indicating that knowledge, while essential, is not the sole factor influencing participation. Unscreened women cited lack of information, cost concerns, and fear of pain or complications as key barriers, while cultural factors like shyness or spousal disapproval were less prominent.

HPV awareness and vaccination rates were low across both groups, with only 2.3% having received the vaccine. Misinformation and fear of side effects were the most common reasons for non-vaccination.

Our findings align with regional and international studies showing that increased knowledge leads to higher screening uptake. Educational interventions have proven effective in improving awareness, suggesting that targeted, culturally appropriate education campaigns could play a critical role in increasing screening participation and reducing the burden of cervical cancer.(16,17)

The educational level in our cohort was a strong predictor of awareness and engagement. Women holding a bachelor's or postgraduate degree showed better knowledge of cervical cancer symptoms and were more likely to distinguish between a Pap smear and other gynecological procedures. In contrast, women with high school education or less were less informed. Similarly, this aligns with a study from Dodoma, Tanzania which found that limited knowledge about cervical cancer is linked to low participation in screening in women of reproductive age (17).

Our study included 1,077 married women, most of whom were between 31–50 years old and held at least a bachelor's degree. Despite the relatively high educational level of participants (53% with a bachelor's degree or higher), cervical cancer screening rates remained low, with only 29.2% having ever undergone a Pap smear and just 6.6% doing so regularly. These findings suggest that while education is a critical factor in increasing awareness, it may not directly translate into higher screening uptake without addressing other barriers (18).

Previous studies have consistently shown a positive correlation between higher education levels and awareness of cervical cancer (11,19). For instance, research by Mitiku et al. and Getahun et al. found that women with more than primary education were significantly more informed than those without formal education (17). Similarly, in our study, the relatively high

educational attainment may explain the comparatively higher awareness rates observed, even though this did not reflect routine screening behavior.

Age also appears to play a role. Studies from Ethiopia have shown that women aged 35–49 were significantly more likely to be knowledgeable about cervical cancer than younger or older age groups (17). In line with this, our sample was largely composed of women in the 31–50 age range, potentially contributing to the overall knowledge levels.

Together, these findings underscore the importance of targeting educational interventions not only at younger or less educated populations but also ensuring that awareness translates into action through accessible, culturally sensitive health services and follow-up support.

Our study found that screened women were more likely to have a higher parity, with 42% reporting five or more pregnancies compared to 29% in the unscreened group. Additionally, nulliparity was significantly lower among screened participants (2.2% vs. 14%). These findings suggest that women with more pregnancies may have more frequent interactions with healthcare providers, increasing opportunities for education and screening.

A history of chronic or hereditary disease and a family history of any cancer were also more common among the screened group. While the prevalence of cervical cancer-specific family history remained low, the overall higher exposure to cancer within the family may have contributed to increased awareness and health-seeking behavior. This aligns with findings from other studies, which showed that women with a personal or close contact history of cervical cancer were significantly more likely to be knowledgeable about the disease (6). One study from Ethiopia reported that women who knew someone with cervical cancer were 3.4 times more likely to have above-median knowledge, suggesting that personal connections to the disease serve as a motivator for awareness and prevention. (17)

These results highlight the role of lived experiences whether through childbirth or exposure to illness in influencing a woman's likelihood to engage in preventive health behaviors such as cervical cancer screening.

In our study, cultural and psychological factors emerged as significant barriers to cervical cancer screening. Approximately 10% of participants cited embarrassment or shyness as their primary reason for avoiding Pap smear testing. Similarly, 8.1% expressed fear that the procedure might be painful or lead to complications. These findings align with research among Latina women in Los Angeles County, where cultural norms, religious beliefs, and psychological perceptions were linked to reduced screening uptake (20) . Notably, more than half of our participants (57.5%) indicated that their husband's opinion did not influence their decision to undergo screening, suggesting that spousal disapproval may not be a dominant factor in this context.

Awareness of HPV and its vaccine was markedly low. Only 9.9% had heard of the vaccine, and just 1.9% reported receiving it. The most commonly reported barriers to vaccination were lack of knowledge (47.4%) and fear of side effects (31.1%). Comparable studies among Asian Indian women in the United States have also highlighted the role of cultural beliefs and language in shaping cervical cancer prevention behaviors, reinforcing the need for culturally tailored educational interventions to improve screening and vaccination rates. (21)

This study provides valuable insights into cervical cancer awareness and screening behaviors among married women in Jordan. The large sample size (n = 1,077) and diverse participant pool strengthen the findings. The use of a reliable, piloted questionnaire ensured consistent data collection, and the study highlighted important factors like parity and family history in predicting screening behaviors.

The cross-sectional design limits causal inferences. Self-reported data may introduce bias, and the study only included women attending healthcare facilities, potentially excluding those with lower health-seeking behaviors. The relatively high education level of participants may limit generalizability to less-educated populations. Low HPV awareness and vaccination rates also hindered deeper analysis of vaccination behaviors.

Future research should involve more in person interviews. We encourage future studies to develop strategies to improve cervical cancer prevention in Jordan. Raising awareness, correcting misconceptions, expanding access to screening and providing HPV vaccination should be our goals. Interventions must consider educational programs with simplified messages and community sessions targeting women with lower levels of education. By training both populations and healthcare professionals, countries can offer more effective prevention of cervical cancer and improved outcomes for patients.

5. CONCLUSION

The study highlights important gaps in knowledge, attitudes and practices of married Jordanian women regarding cervical cancer prevention particulary the use of Pap smear screening and awareness of HPV vaccination. While general awareness of cervical cancer was relatively high this didn't translate into routine screening behaviors. Education and income were strong predictors of both awareness and utilization. The study reported health disparities that need to be addressed through targeted interventions and strategies. Cultural and psychological barriers are major problems. HPV vaccine awareness was low, highlighting the need for national public health campaigns.

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