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RESEARCH ARTICLE
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CERVICAL CANCER AND PAP SMEAR AWARENESS AMONG PARAMEDICAL STAFF

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Abstract:
Introduction: Cervical cancer is preventable, particularly in developed nations due to effective screening programs like Pap smears and human papillomavirus [HPV] testing and the critical role of the HPV vaccine. **Objective**: To assess the knowledge and attitude of paramedical staff regarding cervical cancer, pap smear, HPV infection and the importance of regular screening. **Methods**: A descriptive cross-sectional study was conducted using questionnaire-based survey among 90 nurses from various countries [India, Philippines, Nigeria and Pakistan] working in private tertiary care hospital in Saudi Arabia in January 2021. The ERB letter was taken and statistical analysis was done. **Results**: The awareness among the participant was high with 88% known about cervical cancer and 100% having heard of Pap smears. Despite this high level of awareness, the understanding of cervical cancer risk factors was notably poor. Only 34.2% of married participants had undergone Pap smear testing. Various barriers to undergoing Pap smears were identified. 28% of participant felt embarrassed about the pelvic examination, 16% feared a grave diagnosis, 24% perceived the test as not important and 12% were afraid of the pain associated with the testing. **Conclusion**: There is a need for increased education and awareness among pharmaceutical staff to improve their knowledge of cervical cancer risk factors and the importance of regular screening. Sustained screening approached and the appropriate use of the HPV vaccine are recommended to address constrains in low resources settings**.**

Keywords: Cervical cancer, human papilloma virus (HPV), HPV vaccine, Pap smear, paramedical staff

Introduction

Cervical cancer among second most prevent cancer form in the world in woman populations.[1] But now a day it now 3rd commonly found cancer in woman across the globe..[2] In today's world, cervical cancer is a disease that is primarily found in low-income countries.[3] Cervical cancer is thought to be the most common cancer in women that can be prevented in developing nations, accounting for up to 25% of all female cancers.[4] Several factors which adds less information about the severity and lack of screening among general population are contributing to high burden of disease and advanced stage at presentation. It was still difficult to plan screening programs in developing nations. In areas with the highest cervical cancer burden, there is corresponding insufficient of information and education about this cancer among both the healthcare provider people and woman's. On the other hand, among the contributing factors are a lack of technical, medical, financial, and infrastructure resources.[5]

Furthermore, in the absence of any symptoms, routine pelvic screening is hindered by significant cultural barriers; consequently, a valid screening approach that prioritizes early lesion detection and treatment to lower the incidence of cervical cancer is not commonly adopted.[6] Similarly, in developed countries, despite cytology's demonstrated effectiveness in identifying aberrant cervical cells, its use in areas with effective screening programs is still quite low. Throughout the extended progression of this cancer development, screening compliance is a critical factor in the success of cytology screening in developed nations.[7] The repetitive nature of screening process increases the cost of countries with limited sources. Additionally, for effective screening several visits are required one visit for the test, and another for the results and discussion on further visit and a potential third for medical care that may result in a decline in follow-up in poorly compliant patient who might be most vulnerable to cervical cancer, adding to the complexity of the situation.[8]

Embryologically, there are two different types of cells that make up the cervical epithelium. The ectocervix, is made of no keratinized stratified squamous epithelium, it is the part of the cervix that extends into the vagina its lining is comparable to the vaginal lining; the endocervix, is made of mucus secreting columnar epithelium and is the part of the cervix that leads to the uterus.[9] The squama-columnar junction is the junction of the columnar and the stratified squamous epithelial cells, which undergoes squamous metaplasia by receding towards the endocervix with age. As a result, columnar cells are replaced with stratified squamous epithelium, and cause the "transformation zone" to form, from the initial squama-columnar junction to the present squama-columnar junction.[10] in the transformation zone of cervical epithelium, a variety of abnormal cellular changes occur due to the rapid turnover of cell making it particular susceptibility to carcinogen and the process of carcinogenesis and HPV infections. The transformation zone is where the majority of precancerous cervical lesions and cancers start. Squamous cell carcinoma [SCC] is nearly 75 to 80% of all cervical cancers and the remaining 25% are Adenocarcinomas.[11]

The human papillomavirus (HP) I among the most widespread sexually transmitted infection globally affecting both men and woman. Over 75% of adults who are sexually active have never had an HPV infection. HPV is necessary for the Cervical epithelial cells transforming, but it is insufficient, and a number of additional variables and molecular processes affect the likelihood that cervical cancer will develop. Cervical cancer can be avoided by treating precancerous lesions promptly after they are detected.[12] Cervical cell cytological screening has been the main method used to identify precancerous lesions. However, some patients with borderline or moderately dikaryotic morphology will have higher-grade disease that is discovered by further colposcopy and biopsy. Epidemiologic research unequivocally shows that sexual activity affects the incidence of genital HPV infection and cervical cancer. In addition to its high resistance to heat and desiccation, HPV can also spread non sexually through fomites, such as through sharing contaminated clothing that is worn for an extended period of time. Early onset of sexual activity, a history of other STDs, genital warts, abnormal Pap smears, or a sexual partner's or own history of cervical or penile cancer all increase a person's risk.[13] The use of condoms may not provide sufficient protection against HPV exposure because the virus can spread through contact with infected labial, scrotal, or anal tissues that are not protected by a condom. Age is another significant factor in determining the risk of HPV infection, in addition to sexual activity. Young women between the ages of 18 and 30 who are sexually active are most likely

to contract HPV. After the age of thirty, the prevalence sharply declines. On the other hand, women over 35 are more likely to develop cervical cancer, which suggests early infection and a delayed cancerous progression.[14]

It has been suggested that there is a clear relationship between the viral load and the severity of the illness. Infection with high risk oncogenic HPV types is more likely to persist and play a critical role in the development of cervical cancer. Malignant tumors can be caused by high-risk HPVs of any kind, even in cases where their levels are low.[15] Worldwide, HPV has been linked to 99.7% of cases of cervical squamous cell cancer Cervical adenocarcinomas and HPV are also associated, albeit the relationship is less strong and varies with age. Only 43% of women aged 60 years and older had adenocarcinomas with HPV, compared to 89% of women under 40. Some studies have found that long-term use of oral contraceptives is a significant risk factor for high-grade cervical disease, while other studies have not shown any correlation. Other factors that appear to have an independent impact on the risk of cervical cancer include parity and current smoking.[12] The recognition and acceptance of a genetic predisposition to lung cancer, melanoma, and colorectal cancer dates back many years. This study employee a descriptive cross-sectional design to evaluate the knowledge and attitude of paramedical staff regarding cervical cancer.

Material and Methods:

Study Design and Setting

This research utilized a descriptive cross-sectional design, carried out from June 2021 to December 2021 at the Department of Obstetrics and Gynecology, University of Lahore. The primary objective of the study was to evaluate the knowledge and perspectives of paramedical staff regarding cervical cancer, Pap smear testing, HPV infection, and the significance of regular screenings.

Participants and Sampling

A total of 90 nurses and paramedical staff, aged between 20 and 60 years, were randomly selected to participate in the study. Participants with less than one year of clinical experience or those who chose not to participate were excluded from the study.[24]

Data Collection

Data were gathered through a structured, self-administered questionnaire, which was designed to assess participants' understanding of cervical cancer, HPV, Pap smear procedures, and preventive measures.[25] The questionnaire, validated for clarity and reliability, was provided in English.

Ethical Considerations

Ethical approval for the study was obtained from the Ethics Review Board of the University of Lahore. All participants were informed about the nature and purpose of the study and voluntarily consented to participate. Confidentiality of their responses was ensured throughout the study.

Data Analysis

Descriptive statistical methods, including frequencies and percentages, were used to summarize the data. The Chi-square test was employed to determine any significant relationships between variables, with a p-value of less than 0.05 considered indicative of statistical significance.

Limitations

This study was conducted at a single university hospital, which may limit the extent to which the findings can be generalized to other settings. Furthermore, as the data collection was based on self-reported responses, there is a possibility of response bias.

Results

In a study 90 participants are given questionnaires. Participant’s age ranging from 20-60 yrs. and only one participant is above 60 yrs. out of [n=90] 2 %, (n=2] are widows, 40 %(n=36] unmarried, and

57.8 % [n=52] are married. 88% [n=80] knows about cervical cancer and 100% participants heard about pap smear. On inquiring about risk factor 87.8% [n=79] answered yes and 8.9% [N=8] don't know about risk factor for cervical cancer and 3.3% did not answered. On further details about causative factors 41.1% did not answered 17.8% and 7.8% knows causative factor is HPV and hormonal imbalance ,10% knows its multiple partners and hereditary and 14.4% knows family history and smoking is the reason. Out of married participants[n=38] only [n=13] 34.2% undergone pap smear and 55.8% didn't go for screening test.

The participants who never had pap testing 12 % didn't give any answer for not doing pap test 28% feel embarrassed for pelvic examination 16% afraid of grave diagnosis and 24% thinks it's not important and 12% afraid of pain while testing .out of total participants, only 25.6% (n=23] answered rightly about frequency of pap smear testing, 42.2% (n=38] given wrong answer and [n=29] 32.2% don't know about frequency of testing. This is indicated in table 1.

Table 1: The characteristics of participants under study

Category	**Details**	**Frequency (n)**	**Percentage %)**
Demographics			
Age	20–60 years	89	98%
	Above 60 years	1	2%
Marital Status	Widows	2	2%
	Unmarried	36	40%
	Married	52	57.80%
Knowledge About Cervical Cancer			
Heard of cervical cancer	Yes	80	88%
Heard of pap smear	Yes	90	100%
Risk Factor Awareness			
Knows risk factors	Yes	79	87.80%
	Don't know	8	8.90%
	Did not answer	3	3.30%
Causative Factors			
Did not answer		37	41.10%
HPV		16	17.80%
Hormonal imbalance		7	7.80%
Multiple partners		9	10%
Hereditary		9	10%
Family history & smoking		13	14.40%
Pap Smear Screening			
Married participants screened	Yes	13	34.20%
	No	25	55.80%
Reasons for Not Having Pap Testing			
Did not answer		11	12%
Embarrassment		25	28%
Fear of diagnosis		14	16%
Thinks it's unimportant		21	24%
Fear of pain		11	12%
Knowledge of Pap Smear Frequency			
Correct answer		23	25.60%
Wrong answer		38	42.20%
Don't know		29	32.20%

The table 2 presents data on HPV-related symptoms, associated diseases, and preventive methods, categorized by "Yes," "No," and "Not Sure" responses as percentages. Among symptoms, post-coital bleeding (47.5%) and cervical discharge (45.5%) were the most commonly reported, while dyspareunia (43.5%) and low back pain (37.5%) had high uncertainty rates. For HPV-related diseases, warts were the most recognized (52%), while awareness of cancers like oropharyngeal (22.5%) and lung (17.5%) was lower with significant uncertainty. Preventive measures showed the highest endorsement for the HPV vaccine (65%) and condom use (60.5%), whereas monogamy and other methods had moderate awareness with notable uncertainty (40–40.5%).

Table 2: Awareness, symptoms and other disease preventive measurements

Parameters	**Yes (%)**	**No (%)**	**Not Sure (%)**
Symptoms			
Post-coital bleeding	47.5	23	29.5
Intermenstrual bleeding	35.5	25	39.5
Post-menopausal bleeding	43	24	33
Cervical discharge (altered color/smell)	45.5	21	33.5
Chronic low back pain	36	26.5	37.5
Dyspareunia	32.5	24	43.5
Other Diseases Caused by HPV			
Warts	52	31	17
Anal cancer	30	40.5	29.5
Oropharyngeal cancer	22.5	42	35.5
Lung cancer	17.5	41.5	41
Preventive Methods			
Using condoms	60.5	13.5	26
HPV vaccine	65	14.5	20.5
Monogamy	39.5	20.5	40
Other methods	41	18.5	40.5

The figure 1 shows results for not showing underwent diagnosis

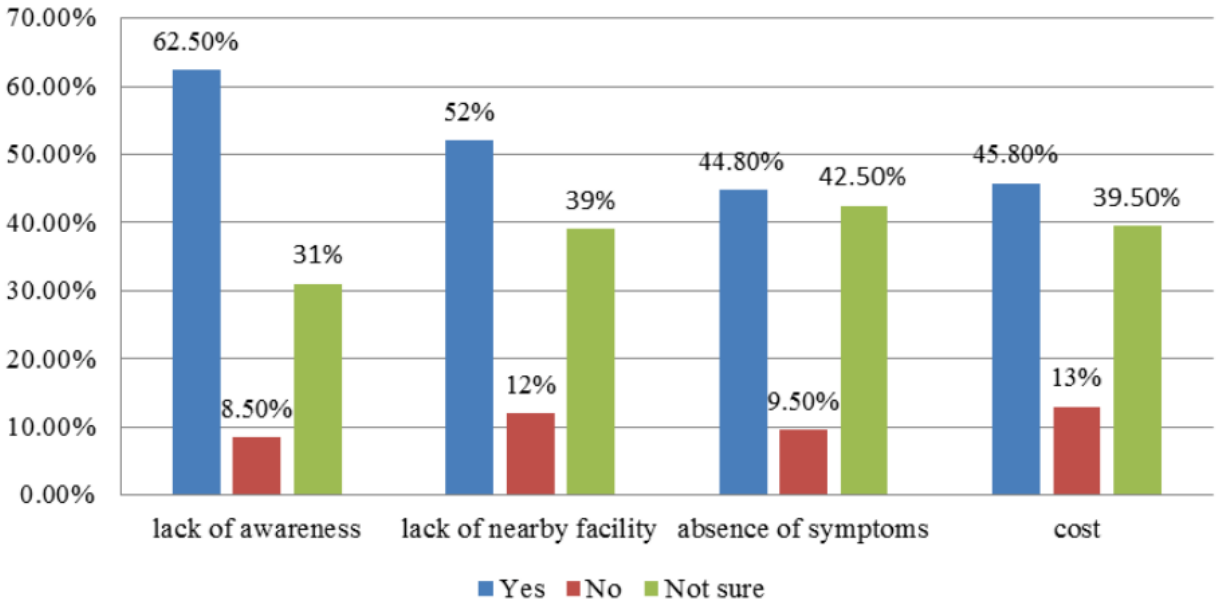

Figure 1: Showing results for not showing underwent screening/diagnosis

The table 3 compares findings from various studies on cervical cancer awareness, HPV knowledge, and preventive practices across different populations. Sample sizes range from 90 to 510 participants,

with age groups spanning 16–66 years. The studies involve diverse cohorts, including medical, nursing, paramedical students, and rural women. Awareness of cervical cancer was highest among paramedical staff and students (79%) and the present study's participants (78%). Knowledge of HPV as the cause of cervical cancer varied widely, peaking at 68% in the present study and dropping to 22.1% among rural women. Screening via Pap smear showed significant variation, from 9.5% in rural women to 79% among paramedical staff. Awareness of HPV vaccine availability ranged from 31% to 81.5%, with medical and nursing students in Ganju S A et al.'s study reporting the highest level.

Table 3: Compare of present study with various other study

Study	Sample Size (n)	Age Range	Education	Awareness Regarding Cervical Cancer	HPV as the Cause	Screening Methods (Pap Smear)	HPV Vaccine Availability
Ganju S A et al 2017[13]	410	16-46 years	Medical and nursing students	65%	62%	48%	81.5%
Rajaram et al 2013[14]	510	21-61 years	Paramedical staff and students	79%	34%	79%	31%
Abd Allah et al 2016[15]	250	19-34 years	Nursing students	-	-	15%	53%
Tongtong et al 2017[16]	400	31-66 years	Rural women	50.8%	22.1%	9.5%	-
Present Study	90	18-27 years	MBBS and nursing students	78%	68%	54%	49%

* The comparison of different studies regarding the knowledge and awareness of cervical disease its diagnosis and vaccination of particular virus.

Regarding awareness revealed to the symptoms of cervical more than half of the participants were not aware that HPV infection can be symptomless, nor were they knowledge about other symptoms such as post bleedings, intermenstrual bleedings, post-menopausal bleedings, and color and foul-smelling cervical discharge. Previous studies have shown tat nurse are typically well informed about the symptoms and risk factors cervical cancer. The American cancer society has suggested focusing on risk factors and behaviors suck as smoking, oral contraceptive use, and unsafe sex to help prevent cancer, despite the findings that 75% of the participants were aware that cervical cancer is preventable. Our study revealed that participants had poor knowledge of the risk factors for cervical cancer. Half of participants were having awareness of cervical cancer. They also using condoms and practicing monogamy are preventive methods. Supporting present study findings showed that the majority of participants were well aware of risk factors for cervical cancer.

Discussion

This study was conducted on paramedical staff in a tertiary care hospital and this shows that 88% and 100% participants know about cervical cancer and pap smear testing respectively as per their professional background but their core knowledge about risk factor for cervical cancer is very poor.[16] Similarly only 34.2% undergone pap smear testing but 42.2% knows exactly how frequently pap smear is done. Reason for not having Pap smear in marital life clearly shows lack of appropriate knowledge regarding risk factors for developing cervical cancer, importance and frequency of Pap smear testing.[17] This study aimed to assess the knowledge and attitudes of paramedical staff regarding cervical cancer, Pap smears, HPV infection, and the importance of regular screening in a private tertiary care hospital in Saudi Arabia. The findings indicate a high level of general awareness about cervical cancer and Pap smears among the participants, but a significant gap in detailed knowledge about risk factors and preventive measure.[18]

The high awareness level of cervical cancer (88%) and Pap smears (100%) among the participant reflects their professional background and the importance of this knowledge in their roles. This is consistent with findings from similar studies, among medical and nursing students and paramedical

staff, respectively.[19] However, while the general awareness is high understanding the specific risk factors, and importance of regular screening remains inadequate. Despite 87% of participants acknowledge the existence of the risk factor for cervical cancer among nursing students. The proof knowledge of risk factors highlights a critical gap that needs to be addressed through targeted education and training programs.[20] The study identified several barriers to undergoing Pap smear testing among the participants, including embarrassments about pelvic examination 28% fear of grave diagnosis 16% perceived lack of importance of the test 24% and fear of pain 12 %. These barriers are similar to those found on others studies including a widespread issue that impacts screening compliance. It is found that cultural and personal barriers significantly hundred that uptake of screening methods. Only 25.7% of the participants knew the correct frequently of Pap smears testing suggesting a significant gap in knowledge about the guidelines for regular screening.[21] This is a crucial findings as regular screening is essential for the early detection and prevention of cervical cancer. The study by Gupta et al., 2012 also highlight the limited-on hospitals in providing information about the correct frequency of Pap smears, which may contribute to this knowledge gap. While 65% of participants were aware of the HPV vaccine and its role in preventing cervical cancer, this knowledge needs more widespread. This awareness of other preventive e methods such as using condoms and practicing monogamy was also relatively high, however there is still room for improvements in promoting the benefits and availability of the HPV vaccine, the study found that hospitals staff were the primary source of information for the participants followed by media, friends and family members, this findings underscores the importance role of healthcare providers in equating and raising awareness about cervical cancer and careening methods.[22] It is also identified media as significant source of information suggesting that combining professional guardienne with media campaigns could enhance awareness and knowledge of the general populations. Previous reports have emphasized the importance of early screening in preventing up to various screening test for cervical cancer. This lack of awareness of concerning and indicate the need for improved education and training on the importance of early detection and available screening methods.[23] The findings of this study emphasize the importance of early detection in the fight against cervical cancer. Although the participants exhibited a high level of awareness about cervical cancer and Pap smear testing, there were notable gaps in understanding the associated risk factors and the frequency of recommended screenings. This indicates the need for enhanced educational initiatives to bridge these gaps and better equip both healthcare providers and patients for preventative measures. Despite the general awareness, multiple obstacles to undergoing screening were identified, such as cultural taboos, anxiety about potential diagnoses, and misconceptions about the discomfort associated with the test. Addressing these emotional and cultural challenges is critical in improving screening participation and furthering the prevention of cervical cancer.

Conclusion

Raising awareness and educating people about cervical cancer and its screening is imperative, the healthcare system cannot afford the high cost associated with advanced cervical cancer management in the current economic climate, rather than a formal throughout screening programs and low resource setting need to take these constraints into account and create sustained and appropriate approaches some example of these include screening methods that focus on the etiologic agents HPV the right age to start screening intervals between screening and one that combines screening and treatment in one go. The HPV vaccine should be introduced appropriately and this can be accomplished by raising awareness and making good use of all the recourse that are available including medical facilities personal and media others,

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Conflict of interest
None

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Questionnaire on Knowledge and Attitudes Toward Cervical Cancer, Pap Smears, and HPV Infection

Section 1: Participant Information

1. **Age Group**:
   - ( ) 20-30 years
   - ( ) 31-40 years
   - ( ) 41-50 years
   - ( ) 51-60 years
2. **Sex**:
   - ( ) Male
   - ( ) Female
3. **Current Marital Status**:
   - ( ) Single
   - ( ) Married
   - ( ) Divorced
   - ( ) Widowed
4. **Your Highest Educational Qualification**:

- ( ) Nurse
- ( ) Medical Assistant
- ( ) Laboratory Technician
- ( ) Other (Please specify): _____

5. **Length of Experience in Healthcare**:
- ( ) Less than 1 year
- ( ) 1-3 years
- ( ) 4-6 years
- ( ) More than 6 years

Section 2: Understanding of Cervical Cancer

6. **Have you heard of cervical cancer?**
- ( ) Yes
- ( ) No

7. **What do you believe to be the primary cause of cervical cancer?** (Select all that apply)
- ( ) HPV (Human Papillomavirus)
- ( ) Smoking
- ( ) Family history of cancer
- ( ) Multiple sexual partners
- ( ) Hormonal factors
- ( ) Other (Please specify): _____

8. **Can cervical cancer be prevented?**
- ( ) Yes
- ( ) No
- ( ) Not sure

9. **Which of the following methods help prevent cervical cancer?**
- ( ) Vaccination
- ( ) Regular Pap smears
- ( ) Both
- ( ) None

Section 3: Knowledge of Pap Smear Testing

10. **Are you familiar with the Pap smear test?**
- ( ) Yes
- ( ) No

11. **What is the main purpose of a Pap smear?**
- ( ) To detect cervical cancer
- ( ) To test for HPV infection
- ( ) To detect early abnormal cell changes in the cervix
- ( ) To screen for urinary tract infections
- ( ) Unsure

12. **How often should women between 21 and 65 years of age have a Pap smear test?**
- ( ) Every year
- ( ) Every 2-3 years
- ( ) Every 5 years
- ( ) Once in a lifetime
- ( ) Unsure

13. **Have you personally undergone a Pap smear?**
- ( ) Yes
- ( ) No

14. **If you haven't had a Pap smear, what are the reasons?** (Select all that apply)
- ( ) Fear of discomfort
- ( ) Lack of knowledge about its importance
- ( ) Embarrassment

- ( ) I don't know where to get one
- ( ) Not necessary
- ( ) Other (Please specify): _____

Section 4: Knowledge of HPV (Human Papillomavirus)

15. **Are you aware that HPV is a major cause of cervical cancer?**
- ( ) Yes
- ( ) No

16. **Which of these health problems are caused by HPV?** (Select all that apply)
- ( ) Cervical cancer
- ( ) Genital warts
- ( ) Throat cancer
- ( ) Oral cancer
- ( ) Not sure

17. **HPV can be spread through:** (Select all that apply)
- ( ) Sexual contact
- ( ) Skin-to-skin contact
- ( ) Oral sex
- ( ) Sharing personal items (e.g., clothes, towels)
- ( ) Other (Please specify): _____

18. **Are you aware that an HPV vaccine is available?**
- ( ) Yes
- ( ) No

19. **Have you recommended the HPV vaccine to others?**
- ( ) Yes
- ( ) No
- ( ) Not sure

Section 5: Views on Screening and Prevention

20. **Do you think cervical cancer screening (Pap smear) is important for all women over the age of 21?**
- ( ) Yes
- ( ) No
- ( ) Not sure

21. **How important do you believe it is to educate patients about cervical cancer prevention and HPV vaccination?**
- ( ) Very important
- ( ) Somewhat important
- ( ) Not important

22. **What are some of the barriers to cervical cancer screening in your community?** (Select all that apply)
- ( ) Lack of awareness
- ( ) Cultural taboos
- ( ) Fear of the procedure
- ( ) Unavailable or costly resources
- ( ) Other (Please specify): _____

23. **How confident are you in your ability to explain the importance of Pap smears and HPV vaccination to patients?**
- ( ) Very confident
- ( ) Somewhat confident
- ( ) Not confident

Section 6: General Awareness and Prevention

24. **Which of the following symptoms may indicate cervical cancer?** (Select all that apply)
- ( ) Unusual vaginal bleeding

- ( ) Pain during sexual activity
- ( ) Unexplained pelvic pain
- ( ) Atypical vaginal discharge
- ( ) No symptoms (early-stage cervical cancer can be asymptomatic)
- ( ) Not sure

25. **What measures are recommended to prevent cervical cancer?** (Select all that apply)

- ( ) Getting the HPV vaccine
- ( ) Regular Pap smear testing
- ( ) Using condoms during sexual activity
- ( ) Limiting the number of sexual partners
- ( ) Other (Please specify): _____

26. **Do you think there should be more public awareness campaigns about HPV vaccination and cervical cancer prevention?**

- ( ) Yes
- ( ) No
- ( ) Not sure