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Original Research Article

Assessment of Urban Women's Knowledge and Awareness Regarding Pap Smear Screening, Cervical Cancer, and HPV Infection

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Abstract:

Background: Human papillomavirus (HPV) is a prevalent sexually transmitted infection, with high-risk types contributing to cervical cancer. Despite its public health significance, awareness of HPV, cervical cancer, and preventive measures like Pap smear screening remains low among urban women.

Aim: To evaluate urban women's knowledge, awareness, and attitudes regarding Pap smear screening, HPV infection, and cervical cancer.

Methodology: A cross-sectional descriptive study was conducted at Department of Obstetrics and Gynaecology, Radha Devi Jageshwari Memorial Medical College and Hospital, Muzaffarpur, Bihar, India, involving 60 urban women aged ≥18 years. Participants completed a structured questionnaire assessing sociodemographics, awareness of HPV, cervical cancer symptoms and risk factors, and Pap smear knowledge. Data was analyzed using SPSS 27, with chi-square tests evaluating associations between awareness and education level.

Results: Most participants were young to middle-aged (73.3% aged 18–35), married (80%), and moderately educated (66.7% secondary or graduate level). Awareness of HPV was low (30%), with only 16.7% recognizing its link to cervical cancer. Pap smear awareness (41.7%) and uptake (16.7%) were limited. Higher education was significantly associated with greater Pap smear awareness ($\chi^2 = 7.84$, $p = 0.049$).

Conclusion: Urban women exhibited significant deficiencies in their understanding of HPV, cervical cancer, and Pap smear screening, underscoring the necessity for focused health education and accessible preventative interventions.

Keywords: HPV, Cervical Cancer, Pap Smear, Awareness, Urban Women.

Introduction

The human papillomavirus (HPV) is probably one of the most widespread sexually transmitted viral infections in the world as it impacts millions of women annually [1]. It is transmitted mainly by skin-to-skin contact during sexual intercourse and therefore, multiple types of HPV can infect the anogenital area. Most infections can be resolved but chronic infection in high-risk HPV types may result in serious health outcomes in the long term [2]. Nevertheless, HPV awareness, especially in women in high densities in the urban areas remains behind its epidemiological effects.

Over a hundred genotypes of HPV have been identified and out of these, serotypes 16 and 18 are the cause of most of the cervical dysplasia and some seventy percent of cervical cancer cases across the globe. Most genital warts are caused by low-risk genital warts such as HPV 6 and 11, which cause psychosocial distress and stigmatization in the affected women [3]. These differences in high-risk and low-risk types indicate the necessity of the right knowledge regarding HPV infection, transmission, and disease outcomes.

Cervical cancer is a major health concern within the community and is among the foremost causes of cancer-related mortality in women globally [4]. Although there has been a decrease in mortality in most parts because of early intervention by use of Papanicolaou (Pap) smear screening, cervical cancer still has a disproportionate impact on the populations that lack access to healthcare, preventive services and health education [5]. Women in urban areas, although the health facilities are within a walking distance, tend to have obstacles in terms of awareness, cultural practices, lack of time, and their perception of the reproductive health.

Regular Pap smear is a critical prevention measure of detection of precancerous lesions of the cervix in

an early and curative phase. This test has been critical in lowering the incidence of cervical cancer, but its success depends on the readiness and capacity of the women to screen themselves regularly [6]. Ignorance of the intention of Pap smear, fear of procedure, social stigma, and misinformation are some of the reasons why many urban populations do not follow or irregularly follow the screening process. It is important to understand such gaps to develop effective health interventions.

The research that has been done in various countries shows that a lot of young women do not know much about HPV, its connection to cervical cancer and the role of screening with Pap smears [7] are playing. Majority of the research done has been pooled in the high-income country especially in the United States whereby, the surveys have indicated that the level of awareness amongst the adolescents and young adults is low. As an example, a report by previous researchers indicated that a minor percentage of young girls were aware of HPV or its relationship with cervical cancer. These results highlight the necessity of more multinational initiatives to educate the population [8].

Diseases caused by HPV are not only physically dangerous but also cause emotional and financial burden. Anxiety, strain in relationships, and cancer fear may arise because of diagnosis of HPV or cervical abnormalities [9]. Moreover, prevention of precancerous lesions needs healthcare facilities, follow-ups, and occasionally surgeries that drain the family and health systems. Among urban women, in many cases having to work, family, and social obligations, these burdens can further hinder interest in preventive care.

Awareness creation on HPV infection and prevention is thus a key in changing the health outcomes of women. Enlightenment and promotion of proactive health practices can be achieved through public health initiatives such as community outreach, mass media campaigns and school-based education [10]. HPV vaccination initiatives are being developed, and their effectiveness is self-dependent on the availability and the level of knowledge, acceptance, and long-term involvement in screening programs. An educated society will have greater chances of taking both primary and secondary preventive actions [11].

This study aimed to assess the knowledge, awareness, and views regarding HPV infection, cervical cancer, and Pap smear screening among metropolitan women. The investigation of beliefs, attitudes and information gaps among women would be helpful in determining the determinants which affect preventive health behaviors. Finally, these findings can inform the development of specific educational programs, reinforce the use of cervical cancer prevention measures, and help address the task of decreasing the burden of HPV-related disorders in urban communities.

Methodology

Study Design: This study employed a cross-sectional descriptive design to assess the knowledge and awareness of Pap smear screening, cervical cancer, and human papillomavirus (HPV) infection among urban women.

Study Area: The research was carried out in the Department of Obstetrics and Gynaecology at Radha Devi Jageshwari Memorial Medical College and Hospital, located in Turki, Muzaffarpur, Bihar, India.

Study Duration: The research was conducted for one year Study Participants.

Inclusion Criteria

- Urban women attending the outpatient department (OPD).
- Women aged 18 years and above.
- Women who provided informed consent.

Exclusion Criteria

- Women with known psychiatric illness preventing questionnaire participation.
- Severely ill patients requiring emergency care.
- Women who refused to participate.

Sample Size: The study involved a total of 60 participants.

Procedure: A consecutive sample of eligible women visiting the gynaecology OPD was approached and informed about the purpose of the study. After obtaining written informed consent, each participant was interviewed privately using a pre-tested, structured questionnaire. The questionnaire was developed after reviewing relevant literature and included sections assessing demographic details, awareness of HPV infection, symptoms and risk factors of cervical cancer, and knowledge and understanding of Pap smear screening. Three trained interviewers administered the survey, having undergone orientation sessions and practice interviews prior to data collection to ensure uniformity and accuracy of administration. Interviews were conducted in a private room within the department to ensure confidentiality and comfort. Each interview lasted approximately 15–20 minutes. All participants were assured that participation was voluntary and that their responses would remain confidential. Ethical approval for the study was obtained from the Institutional Ethics Committee of Radha Devi Jageshwari Memorial Medical College and Hospital.

Statistical Analysis: Data collected were inputted into Microsoft Excel and analyzed utilizing SPSS version 27. Descriptive statistics, including frequencies, percentages, means, and standard

deviations, were employed to summarize the variables. With a significance level set at $p < 0.05$, chi-square (χ^2) tests were used to evaluate relationships between awareness levels and particular demographic characteristics.

Result

Table 1 shows the 60 respondents; the majority were young-middle-aged adults with the largest category being 2635 years (40%), followed by 1825 years (33.3%). The level of education ranged and most of them had secondary education (36.7) or were graduates and above (30%). Most of the participants (80% of them) were married and more than half of them were homemakers (53.3%), with the smaller percentages working (30% of them) or self-employed (16.7%). Regarding income, almost fifty percent of the respondents made 10,000- 20,000 (46.7) per month and 28.3% made over 20, 000 and 25% made below 10,000. The sample, in general, represents a well-educated and mostly married population with middle-income and many homemakers.

Table 1: Sociodemographic Attributes of the Participants (N = 60)

Variable	Categories	Frequency (n)	Percentage (%)
Age (years)	18–25	20	33.3
	26–35	24	40
	36–45	10	16.7
	>45	6	10
Educational Status	No formal education	8	13.3
	Primary	12	20
	Secondary	22	36.7
	Graduate and above	18	30
Marital Status	Married	48	80
	Unmarried	10	16.7
	Widowed/Separated	2	3.3
Occupational Status	Homemaker	32	53.3
	Employed	18	30
	Self-employed	10	16.7
Monthly Income	< ₹10,000	15	25
	₹10,000–20,000	28	46.7
	> ₹20,000	17	28.3

Table 2 demonstrates that there is a general low level of awareness of HPV infection in the 60 participants. This is because only 30% of them had heard about HPV and even fewer of them were aware of the important things to know about the infection. Only 20 percent were aware that HPV is sexually transmitted, and the single-largest portion (80 percent) were unaware or had no idea. There was a significant lack of understanding of the correlation between HPV and cervical cancer, with only 16.7% of individuals recognizing the connection between these two potentially fatal disorders, while 83.3% remained uninformed about this critical relationship. The results suggest that there is a significant lack of knowledge about HPV and its health consequences.

Table 2: Awareness of HPV Infection Among Participants (N = 60)

Awareness Parameter	Response Categories	Frequency (n)	Percentage (%)
Heard of HPV infection	Yes	18	30
	No	42	70
Knows HPV is sexually transmitted	Yes	12	20
	No/Not sure	48	80
Aware that HPV causes cervical cancer	Yes	10	16.7
	No	50	83.3

Table 3 shows that among 60 respondents; knowledge of cervical cancer symptoms and risk factors is rather low. Less than half made correct identifications of any of the symptoms or risk factors listed with the greatest recognition of persistent vaginal discharge (36.7%) and poor genital hygiene (33.3%). The other important symptoms like the pain in lower abdomen (30) and post-coital bleeding (25) were also not aware. Awareness of key risk factors was low especially in identifying early sexual activity, multiple sexual partners and awareness of HPV infection as the leading risk factors of cervical cancer were only 20 percent, 16.7 percent and 15 percent respectively. The results indicate substantial deficiencies in understanding the warning signals and causes of cervical cancer.

Table 3: Awareness of the Symptoms and Risk Factors Associated with Cervical Cancer (N = 60)		
Knowledge Item	**Correct Response (n)**	**Correct (%)**
Persistent vaginal discharge	22	36.7
Post-coital bleeding	15	25
Lower abdominal pain	18	30
Early sexual activity as risk factor	12	20
Multiple sexual partners	10	16.7
HPV infection as main risk factor	9	15
Poor genital hygiene	20	33.3

Table 4 demonstrated that the knowledge and awareness of Pap smear screening among the 60 respondents is generally inadequate. Fewer than half (41.7%) were aware of the Pap smear test, and an even smaller proportion (30%) of the examined population recognized that the Pap smear test is utilized for the early detection of cervical cancer. The knowledge level on the recommended screening frequency was also very low and only 13.3% succeeded in providing accurate information on the fact that Pap smears should be carried out after every three years. There was also low screening uptake with only 16.7% of the participants having undergone a Pap smear at some time in their lives and this implies that there are a lot of knowledge and preventive health gaps regarding cervical cancer.

Table 4: Knowledge and Awareness of Pap Smear Screening (N = 60)			
Knowledge Parameter	**Response Categories**	**Frequency (n)**	**Percentage (%)**
Heard of Pap smear test	Yes	25	41.7
	No	35	58.3
Knows Pap smear detects cervical cancer early	Yes	18	30
	No	42	70
Knows recommended frequency (once every 3 years)	Yes	8	13.3
	No	52	86.7
Ever undergone Pap smear test	Yes	10	16.7
	No	50	83.3

Table 5 indicates the relationship between the awareness of the Pap smear test on education level by chi-square test. The highest level of awareness of the test was among women with secondary school education (10 aware vs. 12 unaware) and those with a graduate level education or above (9 aware vs. 9 unaware), and least among those with no formal education (2 aware vs. 6 unaware) and primary school education (4 aware vs. 8 unaware). The Chi-square test yielded a value of 7.84 and a p-value of 0.049, indicating a statistically significant link between education level and awareness of the Pap smear test at the 5% significance threshold. This is an indication that tertiary education is mostly associated with increased knowledge of Pap smear screening

Table 5: Association of Awareness of Pap Smear Test with Education Level (Chi-square Test)				
Education Level	**Awareness: Yes (n=25)**	**Awareness: No (n=35)**	**χ^2 value**	**p-value**
No formal education	2	6		
Primary	4	8		
Secondary	10	12	7.84	0.049*
Graduate and above	9	9		
Total	25	35		

Discussion

The present study evaluated the sociodemographic characteristics and knowledge of HPV infection, cervical cancer, and Pap smear screening among 60 participants. Most of the respondents were middle-aged to young adults, with the highest proportion of 2635 years (40 percent) and 1825 years (33.3 percent). Most of the participants (80 percent) were married, which indicated that they were mostly family-oriented adults, and more than half were homemakers (53.3 percent), with smaller percentages being employed and self-employed. There were differences in the education levels with most of them having secondary education (36.7%), graduates and above (30%). The income distribution indicated that about half of them had incomes ranging between 10,000-20,000 monthly (46.7), which means that the sample was moderate in respect of financial security. In general, the study population was composed of primarily married women of middle-level

education, large percentage of whom were homemakers and middle-level income groups.

Although the demographic representation was made, the level of awareness on HPV infection among the participants was quite low. Approximately one-third of the individuals possessed knowledge about HPV, and only one-fifth of that group recognized its mode of sexual transmission. Awareness of the association between HPV and cervical cancer was limited, with just 16.7% recognizing this link. These results demonstrate that there is a considerable gap in the etiology and transmission of HPV that is a critical factor in preventive health behaviors. The gap in knowledge about HPV highlights the necessity of specific educational intervention, in particular, the sexual health literacy and its contribution to the prevention of cervical cancer. Similar research conducted by Kwan et al., (2008) [12] among Chinese teenage girls in Hong Kong revealed that knowledge among the participants on cervical cancer was very low. The participants could not comprehend the connection between HPV and cervical cancer.

There was also low awareness of the signs and symptoms of cervical cancer and risk factors. Among the number of respondents who were able to correctly name the symptoms, only fewer than half (36.7 and 33.3) identified persistent vaginal discharge or poor genital hygiene. There was also poor knowledge of other important symptoms such as lower abdominal pain (30% and post-coital bleeding (25%). Risk factor awareness was also very poor as only 20% were aware of the importance of early sexual activity, 16.7% of awareness was as to multiple sexual partners, and 15% of awareness was on HPV infection as the main risk factor. These results suggest that the participants were not very aware of the warning signs and causative factors of cervical cancer, and it may interfere with the early detection and timely medical response. According to Austin et al., (2002) [13], the recommendation of a doctor is a great incentive to get screened on screened.

The awareness and understanding of Pap smear screening were equivalent. While 41.7% were aware of the Pap smear test, only 30% understood its purpose in early cervical cancer detection, and merely 13.3% were informed about the recommended frequency of the test. The rate of screening practice was very low and only 16.7 percent had ever engaged in Pap smear. This kind of low knowledge and use of preventive screening indicates a severe deficiency in health literacy and healthcare participation, and community-based education and available screening services. In a survey conducted by Yu and Rymer in England (1998) [14] 80.5% of the women reported to have undergone at least one Pap smear test in their lifetime.

The correlation between the level of education and knowledge about the Pap smear test was not insignificant ($2 = 7.84$, $p = 0.049$). Women who had secondary education and graduate level education were more aware compared to women who had no formal education or those who only had primary education. This means that the levels of education are closely associated with health awareness, probably because of the availability of more information as well as having the necessary understanding of health messages. These results underscore the need to add educational interventions that should be woman-specific and can enhance the knowledge and uptake of cervical cancer screening. As shown in Fernandez et al., (2009) [15] demonstrated that a health promotion campaign educating medically underserved women effectively increased mammography and Pap test screening rates among low-income and minority women.

In summary, the research revealed that the majority of participants were somewhat educated married housewives with average income, despite a significant lack of understanding regarding HPV infection, cervical cancer symptoms, and Pap smear screening programs. The level of education is a significant determinant of Pap smear awareness and necessitates targeted interventions that should be prioritized in health education and preventive strategies. Awareness-raising, especially among the less educated and younger women is essential towards the reduction of the burden of cervical cancer and early detection.

Conclusion

The research findings reveal that despite the respondents being predominantly young to middle-aged, well-educated, and primarily married homemakers, their comprehension of HPV infection, cervical cancer symptoms, and Pap smear screening was markedly inadequate. Few individuals comprehended that HPV was sexually transmitted or recognized its correlation with cervical cancer, and awareness of the risk factors and symptoms of cervical cancer was similarly deficient. Pap smear screening was also lowly aware and used with the level of education playing major role in the level of knowledge since women who had higher education were more aware of preventive measures. These outcomes highlight the dire necessity of specific health education, outreach programs in the community, and healthcare programs that offer easy access to screening, improved knowledge, early diagnosis, and preventive practices, especially among less educated and younger urban women.

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