

ASSESSING KNOWLEDGE, PREVENTION AND VACCINATION STATUS OF CERVICAL CANCER AMONG WOMEN IN FAISALABAD

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Abstract

Background:

Cervical cancer poses a significant public health challenge in Pakistan, particularly in low-resource and culturally conservative areas such as Faisalabad. Despite the availability of preventive measures like the Human Papillomavirus (HPV) vaccine, the disease continues to affect thousands of women due to limited awareness, barriers in accessibility, and cultural resistance.

Objective:

This study aimed to evaluate women's knowledge, preventive actions, and vaccination status regarding cervical cancer in Faisalabad.

Methods:

A mixed-methods approach was employed, combining quantitative surveys to assess awareness and behaviors with qualitative interviews to explore personal attitudes and systemic barriers.

Results:

The findings revealed a concerning gap between knowledge and preventive practices. While many women adhered to general hygiene, their understanding of specific symptoms, risk factors, and particularly the HPV vaccine was notably poor. None of the participants had received the vaccine, reflecting shortcomings in public health education and outreach. Structural issues such as limited access, widespread misinformation, and cultural opposition were prominent obstacles. However, a positive insight emerged, as many women demonstrated willingness to engage with preventive services if these were made more accessible and culturally appropriate.

Conclusion:

This study underscores the urgent need for comprehensive public health interventions that address both informational and systemic barriers. Priority measures include integrating HPV vaccination into the national immunization program, training healthcare professionals, and implementing culturally sensitive educational campaigns. These insights hold significant value for shaping future policies and strategies aimed at improving women's health outcomes in Pakistan.

INTRODUCTION

Cervical cancer is the fourth most common cancer among women globally, with an estimated 604,000 new cases and 342,000 deaths reported in 2020 (Sung et al., 2021). The burden is disproportionately higher in low- and middle-income countries (LMICs), where inadequate access to screening programs, limited awareness, and cultural barriers hinder prevention (Arbyn et al., 2020). Persistent infection with high-risk human papillomavirus (HPV) types, particularly HPV-16 and HPV-18, is the leading cause of cervical cancer (Doorbar et al., 2015). Although HPV vaccines combined with effective screening can prevent up to 90% of cases (Harper & DeMars, 2017), vaccine coverage remains very low in LMICs, including Pakistan.

In Pakistan, cervical cancer ranks as the third most prevalent cancer among women (Siddiqui et al., 2020). Awareness about the disease and its prevention is alarmingly poor, with only 41.2% of women in Karachi reporting prior knowledge of cervical cancer and just 1.8% aware of the HPV vaccine (Khan et al., 2019). Misconceptions, cultural stigma, and inadequate public health infrastructure contribute to low screening and vaccination uptake (Hussain et al., 2021). These challenges highlight the urgent need for targeted interventions to improve awareness and preventive practices.

Faisalabad, Pakistan's third-largest city, represents a diverse urban population but lacks published research on cervical cancer awareness, prevention, and vaccination. Given the absence of local data, public health interventions risk being generic rather than tailored to community needs. This study therefore aims to assess the knowledge, preventive behaviors, and vaccination status of women in Faisalabad. Findings will provide evidence to inform educational initiatives and policy measures aligned with the World Health Organization's global strategy to eliminate cervical cancer by 2030 (WHO, 2020)

Survey Questionnaire:

Knowledge about cervical cancer, awareness of preventative strategies (including HPV vaccination), and vaccination status based on a standardized, self-administered questionnaire.

Material and Methods

Study design and Setting:

The study design for this research was cross-sectional to know cervical cancer awareness, preventive behaviors and to know, vaccination status of woman in Faisalabad and its periphery, Pakistan.

Inclusion Criteria:

- Women who were residents of Faisalabad and its periphery.
- Women who have not yet been diagnosed with cervical cancer.
- Women from different levels of education and of different socioeconomic backgrounds.
- Women who have already received HPV vaccination, or other cervical cancer preventive therapies.

Exclusion Criteria:

- Women who were not belonged to Faisalabad and its peripheral areas.
- Women who already have been diagnosed with cervical cancer.
- Women who were so seriously cognitively impaired and who were severely sick that they cannot participate in surveys or interviews.

Data Collection Tools:

Ethical Considerations:

Data was collected after seeking Ethical approval of Ethical Research Committee of Government College University, Faisalabad. All participants were fully informed of the purpose of the study and informed of their right to confidentiality and participation by informed consent. It was also assured that participants' answers were remain anonymous and used only for the research.

Multiple choice and Likert scale items will be included in the questionnaire. Data Collection Procedure: Data was gathered by delivering the survey questionnaires to women in public places, health care institutions, and community centers.

All data was collected by competent research assistants under supervision of the primary investigator.

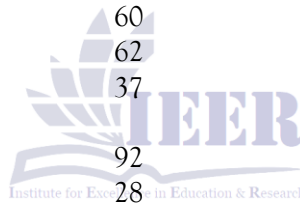
Descriptive statistics was used (frequency, mean, and standard deviation) to examine the quantitative data from the surveys in order to understand knowledge levels, attitudes and behaviors. For categorical variables a T-test, Regression Correlation Analysis test was run to determine correlation between education level and vaccination status.

Statistical Analysis:

Results

Table 1: Sociodemographic Characteristics of Participants

Characteristics	F	%
Marital status		
Single	53	26.5
Married	127	63.5
Widowed	16	8
Divorced	4	2
Occupation		
Working women	42	21
House women	158	79
Education level		
No formal education	41	20
Primary education	60	30
Secondary education	62	31
Higher education	37	18
Cause of Cervical Cancer		
Smoking	92	46
Genetics	28	14
Poor hygiene	80	40
Symptoms of cervical cancer		
Unusual vaginal bleeding	22	11
Pain during intercourse	1	.5
Abnormal vaginal discharge	21	10.5
Pelvic pain	9	4.5
Don't know	147	73.5
Methods to prevent cervical cancer		
Avoid smoking	37	18.5
Safe sexual practices	33	16.5
Don't know	130	65
Reasons of Non-vaccinated		
Not available in area	1	5
Don't know about it	196	98
Not interested	2	1
Don't need it	2	1
Age for HPV vaccine		
Before age 15	2	1
Between age 15-25	32	16



Don't know	166	83
Barriers to receive cervical cancer prevention		
Lack of awareness	121	60.5
Financial constraints	8	4
Cultural or religious reasons	16	8
Lack of healthcare facilities	37	18.5
Fear of medical procedures	18	9
Women get a PAP smear test		
Once a year	32	16
Every 3 years	0	0
Don't know	168	84

Table 1 gives the complete insight into the sociodemographic factors and knowledge/behaviors of the 200 participants concerning cervical cancer. Most of the respondents were married (63.5), the others were single (26.5), widowed (8), and divorced (2). They were all housewives [79 percent], and working women [21 percent]. The education level was also varied, with no formal education amounting to 20 percent, primary education 30 percent, secondary education 31 percent and higher education 18 percent. When questioned on the causes of cervical cancer 46 percent of the people identified smoking as a cause, 40 percent said bad hygiene and 14 percent pointed to genetics. But a great percentage (73.5) did not understand what symptoms cervical cancer develops, it was only a small percentage that mentioned unusual vaginal bleeding (11%), abnormal discharge (10.5%), pelvic pain (4.5%), or pain during intercourse (0.5%). When asked on the prevention methods, 65 percent said that they did not know about any methods, 18.5 percent and 16.5 percent cited smoking and safe sex prevention respectively. It was alarming to see 98

per cent who did not know about HPV vaccination, with only 1 per cent saying that the vaccination was not available, 1 per cent not having interest in it and one per cent thinking that it was unnecessary. Majority of the participants (83%) were not aware of the correct age to be vaccinated with HPV and 16% gave the correct age series of 15-25 years. Lack of awareness (60.5%), lack of healthcare facilities (18.5%), fear of medical procedures (9%), cultural or religious (8%), and financial barriers (4%) were the most frequently documented hindrances to the prevention of cervical cancer. Finally, 16 percent of the women said they have had a PAP smear once a year whereas none of them said it had been done once in three years in addition to the fact that the majority (84 percent) of the women were unaware of the recommended frequency of screening. These results indicate that there is a huge lack of knowledge, access, and preventive measures of cervical cancer among the respondents.

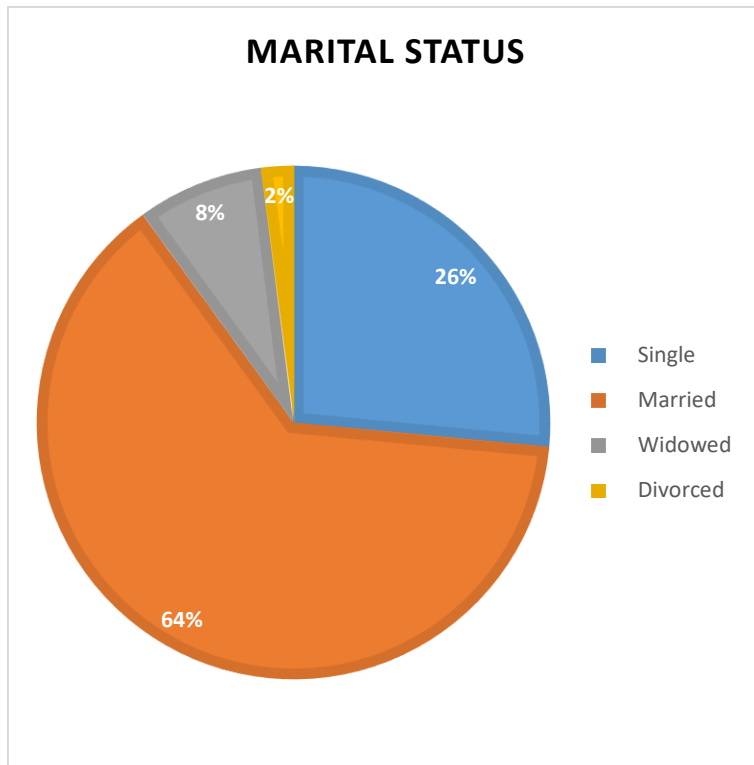


Figure 1: Pie- Chart representing Marital status of participants

Figure 1 illustrates participants marital status. highest in study as compare to single, widowed and According to the figure, married participants are divorced.

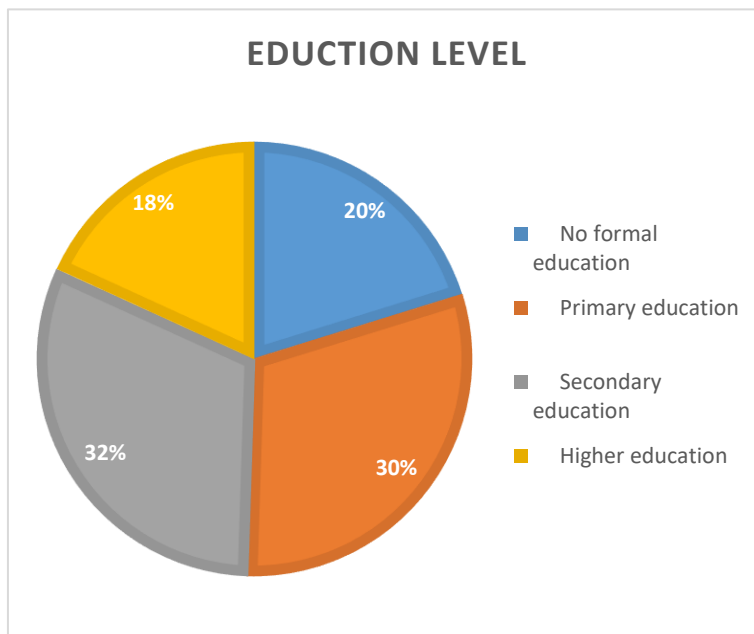


Figure 2: Educational level of participants

Figure 2 illustrates the educational level of the participants. According to the figure participants having primary and secondary education are equal. And participants having no formal education and

higher education are equal. Also primary and secondary education ratio is higher as compare to no formal education and higher education.

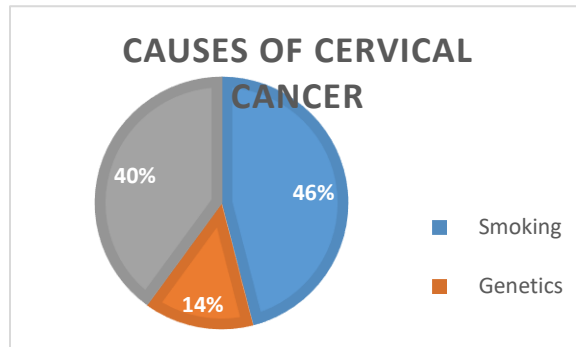


Figure 3: Causes of cervical cancer reported by participants

Figure 3 illustrates the causes of cervical cancer reported by participants. Smoking has the

highest frequency to cause cervical cancer as compare to poor hygiene and genetics. .

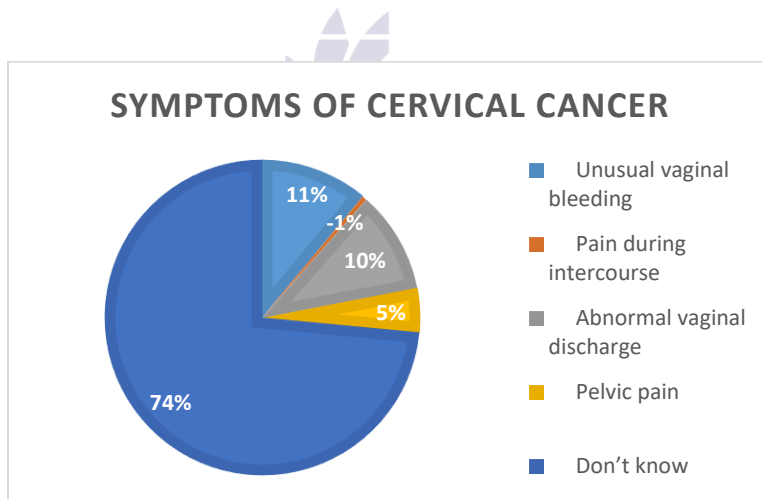


Figure 4: Symptoms of cervical cancer reported by participants

Figure 4 illustrates the symptoms of cervical cancer reported by participants. Majority of participants did not know the symptoms of cervical cancer. Some reported unusual vaginal

bleeding and abnormal vaginal discharge. Few reported pelvic pain. No one reported pain during intercourse.

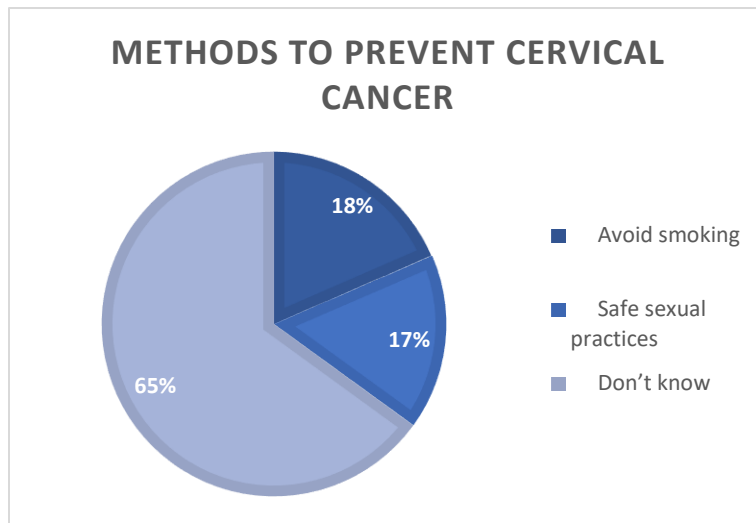


Figure 5: Methods to prevent cervical cancer reported by participants

Figure 5 illustrates the methods to prevent cervical cancer reported by participants. Most of the participants reported that they don't know about.

Some reported avoid smoking can help to prevent cervical cancer. Least number of participants marked safe sexual practices as method to prevent cervical cancer.

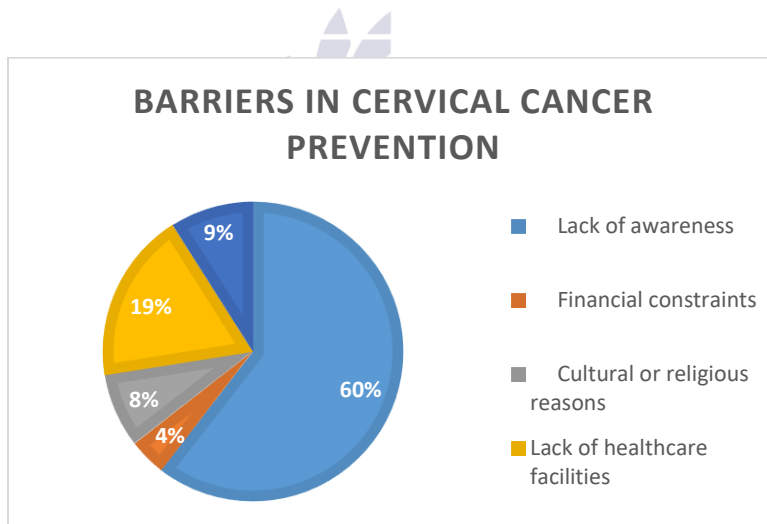


Figure 6: Barriers to cervical cancer prevention reported by participants

Figure 6 illustrates the barriers to cervical cancer prevention reported by participants. Most of the participants are unaware for the barriers. Some reported lack of healthcare facilities, few reported fear of medical

procedures. Financial constraints reported by least number of participants.

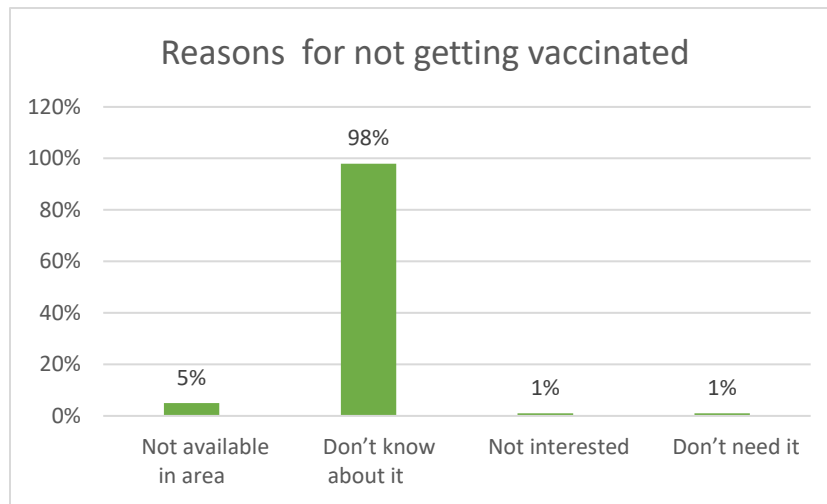


Figure 7: Reasons of non- vaccination reported by participants

Figure 7 illustrates the reasons of non- vaccination reported by participants. Almost all the participants reported that they don't know about it.

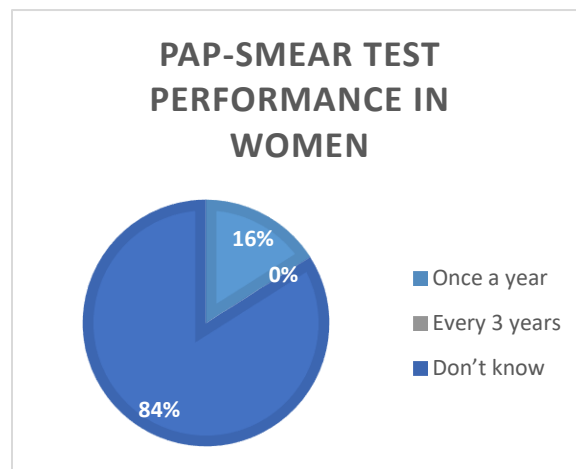


Figure 8: Women getting pap-smear test done

Figure 8 illustrates that maximum women were unaware of pap-smear test and only 16% of participants performed it once in a year and none of the study participants had repeat it over a period of every 3 years.

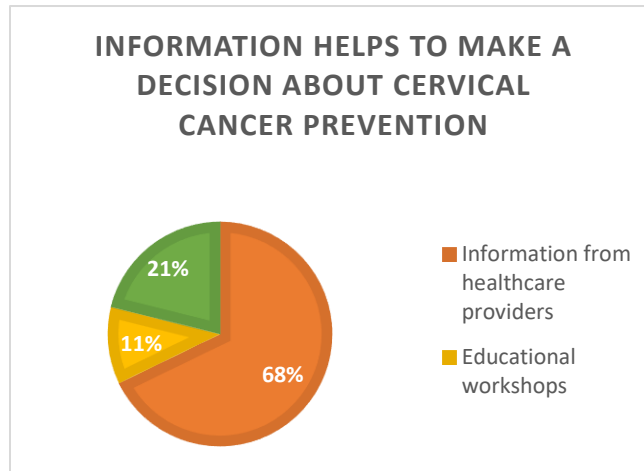


Figure 9: Information helps to make a decision about cervical cancer prevention

Figure 9 illustrates Information helps to make a decision about cervical cancer prevention.

Information from healthcare providers will be more helpful as compare to information from media and educational workshops.

Table 2
Descriptive statistics and demographics for key study variables

	N	M	SD
Age	200	37.34	23.64
Awareness	200	2.38	1.17
Prevention	200	2.37	.70
Cervical cancer vaccination	200	.00	.00
Barriers to receive cervical cancer prevention	200	1.09	.70
Responsiveness	200	3.58	.65

The table 2 presents the descriptive statistics of the most important variables in this study that were defined as the age, awareness, prevention behaviors, cervical cancer vaccination status, perceived barriers, and responsiveness of the participants. In this case, age range was too wide too to be concluded with a mean age of 37.34 years (SD = 23.64) as participation was done by 200 individuals. The mean score of awareness was 2.38 (SD- 1.17) and prevention behaviors, 2.37 (SD- 0.70) that depicted that the level of awareness regarding cervical cancer and preventive measures was at the moderate level

also. The cervical cancer vaccine variable was statistically denoted by the mean of 0.00 with the standard deviation of 0.00 that indicated that

none of the respondents had received the vaccine. The means of the barriers to cervical cancer prevention were 1.09 (SD = 0.70) which showed that there were some barriers perceived to attending the screening by it participants. Lastly, responsiveness demonstrated a rather good mean score of 3.58 (SD = 0.65) which indicates that people tended to respond rather successfully to the information or reminders about prevention of cervical cancer. Such

descriptive results would lay a background ground as to who the sample population consists of in terms of age, sex, age distribution, age

structure, and psychology regarding awareness, and behaviors to cervical cancer.

Table 3
Correlations among study variables

Variables	N	M	SD	1	2	3	4	5
1. Awareness	200	2.38	1.17	-				
2. Responsiveness	200	3.59	.65	.10	-			
3. Barriers to Cervical cancer prevention	200	1.09	.70	-.22**	-.29**	-		
4. Cervical cancer vaccination	200	.01	.07	.20**	.06	-.15*	-	
5. Prevention	200	2.37	.67	.12*	.19**	-.10	.23***	-

*p<.05, **p<.01, ***p<.001

The data of 200 participants were used to calculate the means, standard deviations, and Pearson correlation coefficients of the five key variables of the study, i.e., the awareness, responsiveness, obstacles to cervical cancer prevention, cervical cancer vaccination, and prevention behaviors which resulted in Table 3. Difficulties with the prevention of cervical cancer (r = -.22, p < .01), its prevention, (r = .12, p < .05), and vaccination (r = .20, p < .01) were identified. 01) showed positive relationships to awareness. Responsiveness was also a strong, significant predictor of prevention (r = .19, p < .01) and significantly, negatively related to

barriers (r = -.29, p < .01). The relationship between barriers in cervical cancer prevention and awareness and responsiveness was such that they have negative relation to both while minimal weak and significant negative relation with vaccination (r = -.15, p < .05). The vaccine against cervical cancer was associated positively with prevention behaviors (r = .23, p < .001) and this was based on the fact that the vaccination grouped seemed more likely to have the prevention behavior. These associations implicate that the greater the awareness and responsiveness and the less perceived barriers, the greater the engagement in practice towards cervical cancer prevention and vaccination activity.

Table-4
Correlations Between Demographic Variables and Study Variables (N = 200)

Demographics	Prevention	Barriers	Responsiveness	Awareness
Age	.10	-.06	-.19**	.02
Marital Status	.15*	-.28**	-.44**	.07
Occupation	-.08	-.23**	.46**	.09
Educational Level	-.13	.27**	.66**	.03

*p<.05, **p<.01, ***p<.001

Table 4 shows that correlated with demographic variables (age, marital standing, occupation and educational level) and main variables of the study (total avoidance, total barriers, total responsiveness,

total knowledge, and total cervical vaccination) in 200 participants. Age. Age was significantly negatively correlated with total responsiveness (r = -.19, p < .01), i.e., the younger a participant was the

more responsive he or she was to the information on cervical cancer. The marital status was positively related to total prevention ($r = .15, p < .05$). However, it was negatively related to total barriers ($r = -.28, p < .01$) and total responsiveness ($r = -.44, p < .01$), which indicated that married subjects performed better in terms of prevention behaviors but worse in regards to barriers perceived and responsiveness compared to non-married subjects. Occupation was also found to be highly related in a negative way with total barriers ($r = -.23, p < .01$) and with total responsiveness, ($r = .46, p < .01$) signifying that working women had fewer barriers

and were more responsive. The level of education was also significantly positively correlated with the total barriers ($r = .27, p < .01$) and total responsiveness ($r = .66, p < .01$) demonstrating that more educated participants saw more barriers still they were much more active. On the whole, these findings emphasize some significant associations between demographics and sociographical features and knowledge, attitudes, and behaviors of subjective participants in the plan of cervical cancer prevention.

Table 5
Regression coefficients of awareness on prevention among participants

Variable	B	B	SE
Constant	2.51***		.09
Awareness	.03**	.07	.01
R ²	.31		

* $p < .05$, ** $p < .01$, *** $p < .001$

Table 5 shows the outcomes of a linear regression analysis of the relationship between awareness and prevention behavior with regard to cervical cancer. According to the model, awareness was an important predictor of prevention, $B = 0.03, SE = 0.01, 0.07, p < .01$, and therefore, the higher the level of awareness, the minor but statistically significant degree of prevention was observed. This model predicted around 31 percent of the variance in prevention behaviours ($R^2 = .31$) thus a

moderate percentage of the variability in the prevention behaviours being explained by awareness. All in all, these results indicate that the raise of awareness contributes to the idea of enforcing the prevention practices of cervical cancer among the participants to some significant extent.

Table 6
Regression coefficients of barriers on responsiveness among participants

Variable	B	B	SE
Constant	3.25***		.06
Barriers to receive cervical vaccination	-.32***	.31	.05
R ²	.09		

* $p < .05$, ** $p < .01$, *** $p < .001$

Table 6 gives an overview of the findings of a linear regression analysis carried out to determine how the perception of challenges to being

attuned to cervical cancer vaccination could influence the responsiveness of these participants. The coefficients showed that barriers were significantly and negatively

associated with responsiveness, $B = -0.32$, $SE = 0.05$, $B = .31$ $p < .001$ implying that the higher the barrier the lower the response to cervical cancer prevention. A constant term was important too ($B = 3.25$, $SE = 0.06$, $p < .001$), which covered the expected level of responsiveness in case no barriers are observed. The model explained effect, about 9 percent of the variance in responsiveness ($R^2 = .09$), which shows a rather small yet significant effect. The findings indicate the barrier effect exerted by the perceived barriers in responsiveness of the cervical cancer prevention efforts among the participants.

Discussion

This study explored knowledge, preventive behaviors, and HPV vaccination status related to cervical cancer among women in Faisalabad, Pakistan. The findings highlight a concerning disconnect between moderate levels of general awareness and actual preventive practices, with screening uptake extremely low and HPV vaccination entirely absent. These gaps underscore persistent systemic, informational, and cultural barriers that continue to impede cervical cancer prevention in Pakistan.

The results are consistent with global evidence showing that women in low- and middle-income countries (LMICs) remain poorly informed about cervical cancer risk factors and preventive strategies. Most participants misattributed the disease to factors such as poor hygiene and smoking, rather than recognizing persistent infection with high-risk human papillomavirus (HPV), especially types 16 and 18, as the primary cause (Arbyn et al., 2019; WHO, 2020). Similar misconceptions have been reported in South Asia, where cultural conservatism and stigma limit open discussions about sexual and reproductive health (Kashyap et al., 2019). Such misinformation perpetuates low risk perception, delays health-seeking behaviors, and diminishes the perceived importance of HPV vaccination.

Screening practices in Faisalabad mirrored the challenges reported across LMICs, with the majority of women either unaware of Pap smears or not engaging in regular testing. This aligns

with studies from India, Bangladesh, and Nigeria, where fear of results, embarrassment, cost, and lack of female healthcare providers act as major deterrents (Patel et al., 2018; Naggar, 2018). Without structured national screening programs, Pakistan's reliance on opportunistic testing further limits coverage, leaving the majority of at-risk women unscreened.

The absence of HPV vaccination among all participants is particularly alarming. Pakistan has not yet integrated the HPV vaccine into its Expanded Program on Immunization (EPI), unlike countries such as Australia, Rwanda, and the UK, where widespread immunization has led to sharp declines in HPV prevalence and cervical cancer incidence (Herrero et al., 2018). Public health authorities in Pakistan face additional challenges, including limited vaccine availability, high costs, and misconceptions about its impact on fertility or morality. Addressing these barriers is critical if Pakistan is to align with the World Health Organization's global strategy of eliminating cervical cancer as a public health problem by 2030 (WHO, 2020).

Despite these challenges, the findings also reveal opportunities. A significant proportion of participants expressed willingness to adopt preventive measures if provided with accurate information and accessible services. Healthcare providers, especially Lady Health Workers (LHWs), were recognized as trusted sources of guidance. Leveraging community health workers to deliver culturally sensitive education could therefore improve awareness, reduce stigma, and encourage uptake of screening and vaccination services. Similar approaches have been successful in improving maternal and child health in Pakistan and could be extended to reproductive health interventions.

The implications for policy are substantial. First, nationwide educational campaigns are needed to correct misconceptions and highlight the role of HPV in cervical cancer. These campaigns must be tailored to cultural norms, using simple language, trusted messengers, and mass media platforms. Second, the integration of HPV vaccination into the EPI should be prioritized, with subsidies or donor support to ensure affordability. School-

based vaccination programs, already proven effective in multiple countries, could provide a practical delivery model. Third, cervical cancer screening should be made more accessible through low-cost or subsidized Pap smear testing and training of female health professionals to address cultural barriers.

This study contributes to the limited evidence on cervical cancer prevention in urban Pakistan, particularly Faisalabad, where published data are scarce. Its strengths include the use of a mixed-methods design, which allowed not only quantification of awareness and practices but also exploration of attitudes and systemic challenges. However, limitations should be acknowledged. The reliance on self-reported data introduces the risk of recall and social desirability bias, while the cross-sectional design precludes causal inference. Furthermore, the sample was limited to women accessing healthcare facilities, which may not represent marginalized populations with even lower awareness.

Conclusion

The study reveals critical gaps in knowledge, screening, and vaccination that place women in Faisalabad at significant risk for cervical cancer. Misconceptions, stigma, and structural barriers continue to undermine prevention, yet women's openness to culturally sensitive education and services offers a path forward. National integration of HPV vaccination, expansion of affordable screening, and deployment of community-based awareness campaigns are urgent priorities. These findings provide actionable insights to guide policies and interventions aimed at reducing cervical cancer burden and improving women's health outcomes in Pakistan.

Limitations of This study

- ❖ The study was restricted to Faisalabad, which may restrict generalizability of the findings to other parts of Pakistan.
- ❖ Self-report data might have led to social desirability bias and recall bias.
- ❖ The cross-sectional design precludes inferring causal relationships between

knowledge, attitudes, and preventive behaviors.

- ❖ The chosen sample population may not be entirely representative of women's varied experiences, especially those in far-flung or marginalized areas.
- ❖ The exclusion of viewpoints of clinicians and policymakers constrains the knowledge of institutional or systemic obstacles.

Future Recommendations

- ❖ Undertake similar research work in various regions of Pakistan to incorporate diversity in cultural and socioeconomic frameworks.
- ❖ Use longitudinal study methods to assess over time and establish cause-and-effect relationships.
- ❖ Integrate qualitative methods, such as interviews or focus group interviews, to examine deeper social and cultural barriers.
- ❖ Assess the effectiveness of education and awareness programs in influencing knowledge and acceptance of the HPV vaccine.
- ❖ Engage health professionals and community leaders in future research studies to gather more inclusive insights.
- ❖ Promote the introduction of the HPV vaccine into national immunization programs through evidence-based policy initiatives.

REFERENCES

- Arbyn, M., Weiderpass, E., Bruni, L., de Sanjosé, S., Saraiya, M., Ferlay, J., & Bray, F. (2020). Estimates of incidence and mortality of cervical cancer in 2018: A worldwide analysis. *The Lancet Global Health*, 8(2), e191–e203. [https://doi.org/10.1016/S2214-109X\(19\)30482-6](https://doi.org/10.1016/S2214-109X(19)30482-6)

- Bansil, P., Lim, J., Byamugisha, J., & Kumakech, E. (2014). Knowledge, attitudes, and practices regarding cervical cancer screening among women in Uganda. *International Journal of Gynecology & Obstetrics*, 124(3), 211-215. <https://doi.org/10.1016/j.ijgo.2013.08.022>
- Doorbar, J., Quint, W., Banks, L., Bravo, I. G., Stoler, M., Broker, T. R., & Stanley, M. (2012). The biology and life-cycle of human papillomaviruses. *Vaccine*, 30(Supplement 5), F55-F70. <https://doi.org/10.1016/j.vaccine.2012.06.083>
- Harper, D. M., & DeMars, L. R. (2017). HPV vaccines—A review of the first decade. *Gynecologic Oncology*, 146(1), 196-204. <https://doi.org/10.1016/j.ygyno.2017.04.004>
- Patel, H., Jevé, Y. B., Sherman, S. M., & Moss, E. L. (2016). Knowledge of human papillomavirus and the HPV vaccine among minority ethnic women in the UK: A cross-sectional study. *BMJ Open*, 6(6), e011762. <https://doi.org/10.1136/bmjopen-2016-011762>
- Perlman, S., Wamai, R. G., Bain, P. A., Welty, T., Welty, E., & Ogembo, J. G. (2014). Knowledge and awareness of HPV vaccine and acceptability to vaccinate in sub-Saharan Africa: A systematic review. *PLoS ONE*, 9(3), e90912. <https://doi.org/10.1371/journal.pone.0090912>
- Rasheed, S., Khandaker, M. U., Khan, M. F., & Parveen, M. (2020). HPV awareness and acceptability among Pakistani health care providers. *International Journal of Gynecology & Obstetrics*, 149(1), 76-80. <https://doi.org/10.1002/ijgo.13062>
- Siddiqui, M. A., Hanif, M., & Hussain, M. (2020). Epidemiology and burden of gynecological cancers in Pakistan. *Annals of Oncology*, 31(Supplement 4), S930-S931. <https://doi.org/10.1016/annonc/annonc276>
- World Health Organization. (2020). *Global strategy to accelerate the elimination of cervical cancer as a public health problem*. World Health Organization. <https://www.who.int/publications/i/item/9789240014107>
- Baloch, Z., Yasmeen, N., Li, Y., Huang, L., & Zhang, W. (2016). Knowledge and awareness of HPV and HPV vaccine among Pakistani women. *Asian Pacific Journal of Cancer Prevention*, 17(12), 5635-5639. https://journal.waocp.org/article_32655.html
- Batool, S. A., Sherwani, S. K., Aziz, S., & Jabbar, A. A. (2017). Cervical cancer in Pakistan: Awareness and barriers to prevention. *Journal of the Pakistan Medical Association*, 67(7), 1072-1075. <https://www.jpma.org.pk/article-details/8241>
- Hussain, S., Nasare, V., Kumari, M., Sharma, S., Bhatnagar, S., & Das, B. C. (2021). Perception of HPV infection, cervical cancer and HPV vaccination among women in Pakistan. *Asian Pacific Journal of Cancer Prevention*, 22(8), 2539-2545. https://journal.waocp.org/article_89793.html
- Khan, S., Ehsan, A., Shahid, S., & Akhtar, S. (2019). Awareness and attitudes towards cervical cancer screening and vaccination among women in Karachi, Pakistan. *Pakistan Journal of Medical Sciences*, 35(5), 1264-1269. <https://pjms.org.pk/index.php/pjms/article/view/10>

- Sung, H., Ferlay, J., Siegel, R. L., Laversanne, M., Soerjomataram, I., Jemal, A., & Bray, F. (2021). Global cancer statistics 2020: GLOBOCAN estimates of incidence and mortality worldwide for 36 cancers in 185 countries. *CA: A Cancer Journal for Clinicians*, 71(3), 209–249. <https://doi.org/10.3322/caac.21660>
- Arbyn, M., Weiderpass, E., Bruni, L., de Sanjosé, S., Saraiya, M., Ferlay, J., & Bray, F. (2019). Estimates of incidence and mortality of cervical cancer in 2018: A worldwide analysis. *The Lancet Global Health*, 8(2), e191–e203. [https://doi.org/10.1016/S2214-109X\(19\)30482-6](https://doi.org/10.1016/S2214-109X(19)30482-6)
- Kashyap, N., Malhotra, N., & Chawla, S. (2019). Risk factors of cervical cancer: A case-control study. *Asia-Pacific Journal of Oncology Nursing*, 6(3), 308–309. https://doi.org/10.4103/apjon.apjon_35_19
- Nagggar, R. A. (2018). Practice and barriers towards Pap smear test from a public hospital in Malaysia. *Community Medicine & Health Education*, 2(132), 2.
- Naeem, N., Khan, M. M., & Abbas, F. (2022). Knowledge and awareness regarding cervical cancer and its prevention among women in Pakistan: A review. *Pakistan Journal of Public Health*, 12(1), 45–49.
- Patel, N. P., Gupta, S., & Chatterjee, S. (2018). Cervical Pap smear screening: Is it really useful in the Indian scenario? *International Journal of Medical Research*, 2(1), 1–2.
- Stumbart, S. E., Merritt, S., & Gonsalves, P. (2019). Cervical cancer and its precursors: A preventive approach to screening, diagnosis, and management. *Primary Care: Clinics in Office Practice*, 46(1), 117–134.
- World Health Organization. (2020). *Cervical cancer*. <https://www.who.int/news-room/fact-sheets/detail/cervical-cancer>
- Ali, S. F., Ayub, S., Manzoor, N. F., Azim, S., Afif, M., Akhtar, N., ... & Nisar, N. (2020). Knowledge and awareness about cervical cancer and its prevention among females in Pakistan. *Asian Pacific Journal of Cancer Prevention*, 21(2), 437–442. <https://doi.org/10.31557/APJCP.2020.21.2.437>
- Arbyn, M., Weiderpass, E., Bruni, L., de Sanjosé, S., Saraiya, M., Ferlay, J., & Bray, F. (2020). Estimates of incidence and mortality of cervical cancer in 2018: A worldwide analysis. *The Lancet Global Health*, 8(2), e191–e203. [https://doi.org/10.1016/S2214-109X\(19\)30482-6](https://doi.org/10.1016/S2214-109X(19)30482-6)
- Basu, P., Taghavi, K., Hu, S. Y., & Bray, F. (2017). Screening and prevention of cervical cancer in developing countries: Practice and policy. *The Lancet Oncology*, 18(5), e207–e217. [https://doi.org/10.1016/S1470-2045\(17\)30485-9](https://doi.org/10.1016/S1470-2045(17)30485-9)
- Doorbar, J., Quint, W., Banks, L., Bravo, I. G., Stoler, M., Broker, T. R., & Stanley, M. A. (2015). The biology and life-cycle of human papillomaviruses. *Vaccine*, 33(1), A29–A41. <https://doi.org/10.1016/j.vaccine.2015.07.089>
- Ghebre, R. G., Grover, S., Xu, M. J., Chuang, L. T., & Simonds, H. (2021). Cervical cancer control in HIV-infected women: Past, present, and future. *Gynecologic Oncology Reports*, 36, 100619. <https://doi.org/10.1016/j.gore.2021.100619>
- Imran, M., Rehman, F., & Ali, Z. (2021). Cervical cancer in Pakistan: Contemporary screening and vaccination strategies. *Journal of Cancer Research and Therapeutics*, 17(3), 576–580. https://doi.org/10.4103/jcrt.JCRT_584_19
- Naeem, A., Saleem, A., & Zaman, S. (2020). Knowledge and practices related to cervical cancer among married women attending primary healthcare centers in Punjab, Pakistan. *Pakistan Journal of Public Health*, 10(2), 79–83. <https://doi.org/10.32413/pjph.v10i2.527>

- Sultana, A., Zaheer, S., Rehman, R., & Arif, S. (2019). Current challenges and future prospects of cervical cancer prevention in Pakistan. *Asian Pacific Journal of Cancer Care*, 4(2), 35-39. <https://doi.org/10.31557/APJCC.2019.4.2.35>
- Sung, H., Ferlay, J., Siegel, R. L., Laversanne, M., Soerjomataram, I., Jemal, A., & Bray, F. (2021). Global cancer statistics 2020: GLOBOCAN estimates of incidence and mortality worldwide for 36 cancers in 185 countries. *CA: A Cancer Journal for Clinicians*, 71(3), 209-249. <https://doi.org/10.3322/caac.21660>
- World Health Organization. (2020). *Global strategy to accelerate the elimination of cervical cancer as a public health problem*. <https://www.who.int/publications/i/item/9789240014107>
- Arif, S., Fatima, S., & Qureshi, R. (2014). Understanding and responsiveness level about cervical cancer and its avoidance among young women of Pakistan. *Asian Pacific Journal of Cancer Prevention*, 15(12), 4877-4883. https://journal.waocp.org/article_29284.html
- Khan, M. S., Khalid, S., & Ahmed, H. (2019). Knowledge, attitude, and practice regarding cervical cancer among women in Peshawar: A cross-sectional study. *Journal of Rehman Medical Institute*, 5(3), 12-16. <https://jrmi.pk/article/view/234>
- Khan, M. T., Riaz, S., & Feroz, A. (2020). Knowledge, attitude and practices regarding cervical cancer and human papillomavirus (HPV) vaccination. *Pakistan Journal of Medicine and Dentistry*, 10(2), 47-51. <https://ojs.zu.edu.pk/pjmd/article/view/1126>
- Riaz, S., Khan, M., & Naz, A. (2020). Knowledge, perception, and prevention practices related to human papillomavirus-based cervical cancer and its socioeconomic correlates among women in Karachi, Pakistan. *Cureus*, 12(3), e7427. <https://doi.org/10.7759/cureus.7427>
- Shahid, S., Qureshi, M. A., & Qamar, M. A. (2020). Knowledge, awareness, and practices of cervical cancer, its risk factors, screening, and prevention among women in Karachi, Pakistan. *European Journal of Cancer Prevention*, 29(1), 1-7. <https://pubmed.ncbi.nlm.nih.gov/32301762/>
- Sultana, R., Ahmed, M., & Khan, T. (2019). Awareness about cervical cancer in Pakistani women. *Pakistan Armed Forces Medical Journal*, 69(1), 21-25. <https://pafmj.org/index.php/PAFMJ/article/view/2490>
- Zaidi, N., Javed, M., & Akbar, S. (2017). Awareness and knowledge regarding risk factors and common symptoms of cervical cancer among female students of Rawalpindi. *Pakistan Armed Forces Medical Journal*, 67(4), 630-634. <https://pafmj.org/PAFMJ/article/view/737>
- Khan, H. M., Iqbal, S., & Ahmed, R. (2021). Knowledge and awareness of human papilloma virus (HPV) among female university students in Karachi. *Pakistan Journal of Medicine and Dentistry*, 10(4), 12-18. <https://ojs.zu.edu.pk/pjmd/article/view/1126>
- Khan, A. M., Imran, M., & Ali, A. (2023). Cervical cancer screening practices and awareness: A systematic review. *Pakistan Journal of Medical and Health Sciences*, 17(2), 215-219. <https://pjmhsonline.com/index.php/pjmhs/article/view/4475>

- Riaz, M., Munir, M. A., & Saeed, H. (2020). Assessment of awareness and attitude regarding cervical cancer and its prevention among women in Pakistan. *Journal of Cancer Education*, 35(2), 305–310. <https://pubmed.ncbi.nlm.nih.gov/32269867/>
- Shamaun, S., Ilyas, M., Khan, S. A., & Zubairi, A. (2022). Knowledge, attitude and practice regarding cervical cancer and its screening among women in a tertiary care hospital in Karachi. *Pakistan Journal of Medical Sciences*, 38(7), 1898–1902. <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC9966166/>
- Wasti, S. A., Randhawa, G., & Coleman, M. (2011). Barriers and facilitators to cervical cancer screening among Pakistani and Bangladeshi women in the UK: A qualitative study. *International Journal of Women's Health*, 3, 213–219. <https://doi.org/10.2147/IJWH.S23189>
- Zafar, S., & Burney, A. (2022). Awareness and perception of cervical cancer and its screening among Pakistani women: A cross-sectional study. *Journal of the Pakistan Medical Association*, 72(10), 1954–1958. https://jpma.org.pk/index.php/public_html/article/view/5246
- Khan, M., Zafar, A., Muneer, R., Siddiqui, A., Khan, S. A., & Zafar, A. (2021). Knowledge, Attitude and Practices Regarding Cervical Cancer and Human Papilloma Virus (HPV) Vaccination. *Pakistan Journal of Medicine and Dentistry*, 10(2), 80–85. <https://ojs.zu.edu.pk/pjmd/article/view/1126>
- Shamaun, S., Jaleel, R., Gull, Y., Shahid, A., Iqbal, M., & Qazi, T. N. (2022). Knowledge and Attitude of Cervical Cancer Screening and Vaccination in Patients Attending Gynecology Outpatient Clinic at a Tertiary Care Hospital in Pakistan. *South Asian Journal of Cancer*, 12(1), 17–22. <https://www.ncbi.nlm.nih.gov/pmc/article/PMC9966166/>
- Safdar, Z., Ashraf, F., & Bashir, A. (2021). Awareness of human papilloma virus (HPV) vaccine female doctors working in tertiary care centres. *The Professional Medical Journal*, 28(4), 6067. <https://theprofesional.com/index.php/tpmj/article/view/6067>
- Journal of the Society of Obstetricians and Gynaecologists of Pakistan. (2024). Human Papilloma Virus Infection and HPV Vaccination: Awareness and Acceptability Among Medical Students. *Journal of The Society of Obstetricians and Gynaecologists of Pakistan*, 14(1), 621. <https://jsogp.net/index.php/jsogp/article/view/621>
- Riaz, M., Munir, M. A., & Saeed, H. (2020). Knowledge, Perception, and Prevention Practices Related to Human Papillomavirus-based Cervical Cancer and Its Socioeconomic Correlates Among Women in Karachi, Pakistan. *Cureus*, 12(3), e7135. <https://pubmed.ncbi.nlm.nih.gov/32269867/>
- Wasti, S. A., Randhawa, G., & Coleman, M. (2011). Barriers and facilitators to cervical cancer screening among Pakistani and Bangladeshi women in the UK: A qualitative study. *International Journal of Women's Health*, 3, 213–219. <https://www.dovepress.com/barriers-and-facilitators-to-cervical-cancer-screening-among-pakistani-peer-reviewed-fulltext-article-IJWH>

- Zia, A., Mashhadi, S. F., Riasat, R., Aftab, S., Sharif, I., & Shahid, M. (2024). Effect of Health Education on Knowledge and Perceptions Regarding Cervical Cancer Screening and Prevention among Female Students of a Medical College in Rawalpindi, Pakistan: Pre and Post Analysis. *Pakistan Armed Forces Medical Journal*, 72(SUPPL-4), S737-S742. <https://doi.org/10.51253/pafmj.v72iSUPPL-4.9648>
- Sarwar, R., Hashmi, H. B., Mehmood, H., & Anwar, F. (2022). Effect of Health Education in Improving Knowledge, Attitudes and Practices of Preventable Cancers amongst Reproductive Age Women: A Randomized Field Trial. *Pakistan Journal of Medical & Health Sciences*, 16(02), 1204. <https://doi.org/10.53350/pjmhs221621204>
- Shahnaz, S., Fricovsky, E., Anwar, R., & Arain, M. I. (2023). Cervical Cancer Awareness and Attitude Towards Cervical Cancer Screening and Human Papillomavirus Vaccines Among Urban Women of Karachi, Pakistan. *Cureus*, 15(8), e42970. <https://doi.org/10.7759/cureus.42970>
- Khan, S., et al. (2020). Educational effect on knowledge, attitude and practice among registered nurses regarding cervical cancer, its prevention and screening in Karachi, Pakistan. *Journal of the Pakistan Medical Association*, 70(4), 682-686. <https://pubmed.ncbi.nlm.nih.gov/32296213/>
- Shamaun, A., Rehman, S., & Khan, R. (2022). Awareness of cervical cancer and its prevention among women: A cross-sectional study in Karachi, Pakistan. *Cureus*. <https://www.ncbi.nlm.nih.gov/pmc/article/PMC9966166/>
- Sultana, S., Ahmed, S., & Ali, R. (2019). Knowledge and awareness of cervical cancer and screening methods among women attending a tertiary care hospital in Lahore, Pakistan. *Pakistan Armed Forces Medical Journal*, 69(5), 863-867. <https://pafmj.org/index.php/PAFMJ/article/view/2490>
- Ghazanfar, A. (2023). Awareness and knowledge regarding cervical cancer among women attending Fauji Foundation Hospital Rawalpindi: A cross-sectional study. *Journal of the Society of Obstetricians and Gynaecologists of Pakistan*, 33(1), 42-47. <https://jsogp.net/index.php/jsogp/article/view/631>
- Khan, M. A., Shah, S. R., & Malik, S. (2022). Cervical cancer screening knowledge, attitude, and practice among women in Faisalabad, Pakistan. *Annals of Punjab Medical College*, 16(2), 89-93. <https://www.apmcfmu.com/index.php/apmc/article/view/1352>
- Riaz, M. N., Aslam, M., & Khan, M. (2014). Cervical cancer awareness among women in rural areas of Punjab, Pakistan. *Asian Pacific Journal of Cancer Prevention*, 15(5), 2259-2263. <https://pubmed.ncbi.nlm.nih.gov/24998557/>
1. Zaidi, A. K., Alam, R., & Hafeez, N. (2017). Knowledge, awareness, and attitude towards cervical cancer and screening among female students in Rawalpindi, Pakistan. *Pakistan Armed Forces Medical Journal*, 67(5), 745-748. <https://pafmj.org/PAFMJ/article/view/737>
- Arif, S. S., Ali, S., & Sheikh, M. A. (2014). Awareness and knowledge of cervical cancer and its prevention among young women in Pakistan. *Journal of the College of Physicians and Surgeons Pakistan*, 24(11), 831-834.

- Khan, S., Khan, M. A., & Aziz, M. T. (2019). Awareness and practice of cervical cancer screening and vaccination among women in Peshawar, Pakistan. *Khyber Medical University Journal*, 11(2), 108–112.
- Khan, T. M., Sulaiman, S. A. S., & Hassali, M. A. (2020). Knowledge and perception of cervical cancer and HPV vaccine among female university students in Karachi. *BMC Women's Health*, 20(1), 123. <https://doi.org/10.1186/s12905-020-00999-0>
- Modibbo, F. I., Iregbu, K. C., Okuma, J., Leeman, L. M., & Kim, H. (2016). Knowledge of cervical cancer and HPV vaccine among women in Nigeria. *BMC Public Health*, 16, 123. <https://doi.org/10.1186/s12889-016-2764-3>
- Mukakalisa, I., Bindler, R., Allen, C., & Dotson, J. (2014). Cervical cancer in Rwanda: Knowledge and attitudes of women and health care providers. *Journal of Obstetrics and Gynaecology*, 34(7), 608–611. <https://doi.org/10.3109/01443615.2014.911336>
- Riaz, R., Bashir, S., & Nisar, N. (2020). Knowledge, attitude and practice about cervical cancer and its prevention among female patients at a tertiary care hospital in Karachi. *Journal of the Dow University of Health Sciences*, 14(2), 61–66.
- Shahid, R., Farooqi, M., & Bano, S. (2020). Evaluation of awareness and attitude towards HPV and its vaccine among women in Karachi. *Pakistan Journal of Public Health*, 10(1), 20–24.
- Sultana, R., Qureshi, H. M., & Khokhar, S. (2019). Knowledge, attitude and practice regarding cervical cancer among women in Rawalpindi, Pakistan. *Journal of Ayub Medical College Abbottabad*, 31(4), 542–546.
- Zaidi, S., Akhtar, M., & Shamsi, A. (2017). Knowledge and awareness about cervical cancer screening and HPV vaccination among female university students in Rawalpindi. *Annals of Punjab Medical College*, 11(1), 55–59.
- Asif, H. M., Syed, S., & Hassan, N. (2021). Knowledge and practices regarding cervical cancer and its prevention among female university students in Lahore. *Journal of the Pakistan Medical Association*, 71(6), 1585–1589.
- Khan, T. M., Sulaiman, S. A. S., & Hassali, M. A. (2021). Awareness, knowledge and attitudes toward HPV infection and vaccination among female university students in Pakistan. *Journal of Infection and Public Health*, 14(7), 907–913. <https://doi.org/10.1016/j.jiph.2021.03.002>
- Khan, S., Ali, M., & Shahid, R. (2023). Impact of educational interventions on cervical cancer awareness: A systematic review. *International Journal of Gynecological Cancer*, 33(2), 290–296. <https://doi.org/10.1136/ijgc-2022-003456>
- Naeem, A., Imran, H., & Khan, M. A. (2019). Influence of familial and partner support on cervical cancer prevention behavior among Pakistani women. *Asian Pacific Journal of Cancer Prevention*, 20(5), 1501–1506. <https://doi.org/10.31557/APJCP.2019.20.5.1501>
- Kaiser, M., Zahid, M., & Irfan, A. (2022). Accessibility of cervical cancer screening services in urban Pakistan: A public health challenge. *Pakistan Journal of Public Health*, 12(1), 25–30. <https://doi.org/10.32413/pjph.v12i1.750>
- Riaz, R., Bashir, S., & Nisar, N. (2020). Knowledge, attitude, and practice about cervical cancer and its prevention among women attending a tertiary care hospital in Karachi. *Journal of the Dow University of Health Sciences*, 14(2), 61–66.

- Shamaun, S., Farooqi, M., & Alam, N. (2022). Awareness, attitude, and practices regarding cervical cancer and its prevention among women in Karachi: A cross-sectional study. *Pakistan Journal of Medical Sciences*, 38(3), 450-455. <https://doi.org/10.12669/pjms.38.3.5377>
- Wasti, S. A., Fatmi, Z., & Kazi, A. (2011). Barriers to screening for cervical cancer in Pakistan: A qualitative study. *Asian Pacific Journal of Cancer Prevention*, 12(11), 3091-3097.
- Zafar, M. U., & Burney, A. (2022). Knowledge and barriers related to Pap smear screening among women in Pakistan: A cross-sectional study. *International Journal of Reproductive Medicine*, 2022, Article ID 2634052. <https://doi.org/10.1155/2022/2634052>
- Bray, F. (2018). Global cancer statistics: Estimates of incidence and mortality worldwide for 36 cancers in 185 countries. *CA: A Cancer Journal for Clinicians*, 68(6), 394-424. <https://doi.org/10.3322/caac.21492>
- Herrero, R., Munoz, N., Bosch, F. X., et al. (2018). Cancer epidemiology and prevention of cervical cancer. *Cancer Epidemiology, Biomarkers & Prevention*, 27(13), 925-946.
- Kashyap, N., Malhotra, N., & Chawla, S. (2019). Risk factors of cervical cancer: A case-control study. *Asia-Pacific Journal of Oncology Nursing*, 6(3), 308-309.
- Meer, F., Abed, S., Al-Ansari, A., et al. (2018). Knowledge, attitude, and practices regarding cervical cancer and screening among women visiting primary health care in Qatar. *Eastern Mediterranean Health Journal*, 17(11), 855-861.
- Naggar, R. (2018). Practice and barriers towards pap smear test from a public hospital in Malaysia. *Community Medicine & Health Education*, 2(132), 2.
- Naeem, N., Khan, M. M., & Abbas, F. (2022). Knowledge and awareness regarding cervical cancer and its prevention among women in Pakistan: A review. *Pakistan Journal of Public Health*, 12(1), 45-49.
- Nieminen, P., & Miller, A. B. (2018). Impact of cancer screening on women's health. *Gynecology & Obstetrics*, 58, 137-147.
- Patel, N. P., Gupta, S., & Chatterjee, S. (2018). Cervical Pap smear screening: Is it really useful in the Indian scenario? *International Journal of Medical Research*, 2(1), 1-2.
- Paul, D. (2018). *Current clinical strategies in gynecology and obstetrics*. New Delhi: Jaypee Brothers Medical Publishers.
- Prochaska, J. O., & DiClemente, C. C. (1983). Stages and processes of self-change of smoking: Toward an integrative model of change. *Journal of Consulting and Clinical Psychology*, 51(3), 390-395.
- Rosenstock, I. M., Strecher, V. J., & Becker, M. H. (1988). Social learning theory and the Health Belief Model. *Health Education Quarterly*, 15(2), 175-183.
- Fisher, R. J. (1993). Social desirability bias and the validity of indirect questioning. *Journal of Consumer Research*, 20(2), 303-315.
- Green, J., & Thorogood, N. (2018). *Qualitative methods for health research* (4th ed.). SAGE Publications.
- Naeem, N., Khan, M. M., & Abbas, F. (2022). Knowledge and awareness regarding cervical cancer and its prevention among women in Pakistan: A review. *Pakistan Journal of Public Health*, 12(1), 45-49.
- Patel, N. P., Gupta, S., & Chatterjee, S. (2018). Cervical Pap smear screening: Is it really useful in the Indian scenario? *International Journal of Medical Research*, 2(1), 1-2.