



## Cervical Neoplasma Screening Using Pap Smear Among Women in Kenya: Analysis of Factors and Knowledge

BY

Philip Kasawa Naluande<sup>1,2</sup>, Praveen T. Krishnamurthy<sup>1,4</sup>, Michael F. Otieno<sup>3</sup>, Bahati A. Rapando<sup>1,2</sup>

Texila American University<sup>1</sup>, Clinical and Laboratory Standards Institute – Africa<sup>2</sup>, Kenyatta University<sup>3</sup>, J.S.S College<sup>4</sup>



### Article History

Received: 15/09/2024

Accepted: 24/09/2024

Published: 26/09/2024

Vol – 2 Issue – 9

PP: -24-32

### Abstract

*Cervical neoplasm screening is essential for the early detection and prevention of cervical cancer. Despite the availability of screening programs, uptake remains suboptimal in Nairobi County, Kenya. This publication investigates the multifaceted factors influencing cervical neoplasm screening in the region, including awareness, accessibility, socioeconomic status, and healthcare infrastructure. Understanding these factors is critical for developing effective strategies to improve screening rates and reduce the burden of cervical cancer.*

*Cervical cancer remains a significant health challenge in Kenya, despite advances in screening technologies such as the Pap smear. Cervical neoplasia is a significant public health concern in Kenya, contributing to high rates of cervical cancer morbidity and mortality. This study investigates the demographic factors, screening history, and knowledge levels related to cervical cancer among Kenyan women. The analysis provides insight into the patterns of Pap smear utilization and associated socio-economic and demographic characteristics. Additionally, the study evaluates the prevalence and effectiveness of Pap smear screening in detecting cervical neoplasia among Kenyan women. Utilizing data from a sample of 300 women, we assess the screening uptake, demographic factors influencing screening behaviors, and the impact of Pap smear results on cervical cancer prevention. The findings reveal that while knowledge and awareness of cervical cancer screening are improving, barriers such as socioeconomic status, education, and access to healthcare still impact screening rates. The study underscores the need for targeted educational interventions and improved healthcare access to enhance Pap smear utilization and reduce cervical cancer incidence.*

## INTRODUCTION

Cervical cancer remains one of the leading causes of cancer-related deaths among women in Kenya. Despite advancements in healthcare, screening rates using Pap smears—an effective method for early detection of cervical neoplasia—are still suboptimal (World Health Organization [WHO], 2021). Cervical neoplasia encompasses precancerous changes in cervical cells that can progress to cancer if not detected and treated early (Koss et al., 2014). Effective screening programs are crucial for reducing cervical cancer incidence and improving survival rates.

### Screening Methods and Guidelines

The Pap smear, also known as a Pap test, involves collecting cells from the cervix to identify abnormalities that may indicate neoplasia or cancer (Garcia et al., 2020). The World Health Organization recommends regular Pap smears for women aged 21 to 65, with varying guidelines based on local

healthcare infrastructure (WHO, 2021). In Kenya, screening programs are hampered by limited resources, inconsistent implementation, and cultural barriers (Muriithi et al., 2018). Challenges in Screening Barriers to effective screening include lack of awareness, stigma, and financial constraints (Mwangi et al., 2016). Socioeconomic disparities and regional differences also affect access to healthcare services (Bourke et al., 2018). Previous studies have highlighted that improving knowledge about cervical cancer and enhancing access to screening can significantly impact screening uptake (Naylor et al., 2015). Cervical cancer is a leading cause of morbidity and mortality among women in Kenya. Early detection through screening is critical for effective management and prevention. The Pap smear is a key diagnostic tool in identifying precancerous cells and early-stage cervical cancer. This study examines the relationship between socio-demographic factors and cervical screening practices, as well as the respondents' knowledge about cervical cancer and Pap smear testing.



### Cervical Cancer and Screening in Kenya

Cervical cancer remains one of the most prevalent cancers among women in Kenya, accounting for a significant proportion of cancer cases and deaths. The World Health Organization (WHO) estimates that cervical cancer is the leading cause of cancer-related mortality in Kenya, with a high incidence rate of approximately 39.4 per 100,000 women (World Health Organization, 2021). Pap smear screening has long been recognized as an effective tool for early detection and prevention of cervical cancer. According to the American Cancer Society (2022), regular Pap smears can detect pre-cancerous changes in cervical cells, allowing for early intervention and treatment, which significantly reduces the risk of developing invasive cervical cancer.

### Utilization and Effectiveness of Pap Smear Screening

In Kenya, the uptake of Pap smear screening has been influenced by several factors including socioeconomic status, education, and geographic location. Studies have shown that women in urban areas and those with higher levels of education are more likely to undergo regular cervical cancer screening (Karanja et al., 2017). This disparity is attributed to differences in access to healthcare facilities and awareness levels. Research by Muriithi et al. (2019) highlights that while awareness of cervical cancer and screening is relatively high among Kenyan women, the actual screening rates remain low. Their study revealed that socioeconomic barriers, lack of healthcare infrastructure in rural areas, and inadequate health education contribute to the low screening rates. Similarly, a study by Ndugwa et al. (2018) found that cultural beliefs and stigma surrounding cervical cancer also hindered women from seeking regular screening.

### Socio-Demographic Factors and Screening Practices

Socio-demographic factors play a critical role in the utilization of cervical cancer screening services. For instance, women from lower socio-economic backgrounds are less likely to access screening services due to financial constraints and lack of awareness (Ouma et al., 2020). This is consistent with findings by Kigen et al. (2017), who reported that women in lower income brackets and those living in rural areas face significant barriers to screening, including transportation issues and lack of nearby facilities.

Educational attainment is another important determinant of screening practices. Studies have consistently shown that higher educational levels are associated with increased likelihood of undergoing regular Pap smears (Wangari et al., 2021). Educated women are generally more aware of the importance of regular screenings and are more likely to adhere to recommended guidelines.

### Knowledge and Perceptions of Cervical Cancer Screening

Knowledge about cervical cancer and screening guidelines is crucial for the effective uptake of Pap smears. A study by Nyakundi et al. (2022) revealed that while many women are aware of the existence of Pap smears, there is often a lack of understanding about what the test entails and the recommended frequency of screening. Misconceptions and

inadequate knowledge about cervical cancer can lead to delays in seeking screening and treatment.

The Kenyan Ministry of Health has implemented various public health initiatives aimed at increasing awareness and promoting screening. For example, the National Cervical Cancer Screening Program provides free Pap smear services in certain areas, but uptake remains suboptimal due to logistical and educational barriers (Kenya Ministry of Health, 2020).

## Methods

This cross-sectional study involved 300 women from various regions in Kenya. Participants were surveyed about their Pap smear history, knowledge of cervical cancer, and demographic factors. Pap smear results were categorized into normal, abnormal, and insufficient samples. Data analysis focused on identifying factors influencing screening behaviors and the correlation between Pap smear results and demographic characteristics. Data was collected from a sample of 300 women through surveys, which were then analyzed using frequency tables and chi-square tests to assess associations between screening practices and various socio-demographic variables.

### Statistical Analysis

Descriptive statistics were used to summarize demographic characteristics and screening history. Chi-square tests and logistic regression analyses assessed the associations between demographic factors, knowledge levels, and screening outcomes. A significance level of  $p < 0.05$  was considered for statistical tests.

## Results

### Socio-Demographic Features

The study sample included women with diverse backgrounds:

**Demographic Characteristics:** The sample comprised women aged 20 to 69, with the majority having completed secondary education. Socioeconomic status varied across quintiles, with a significant proportion from lower-income backgrounds. Regional distribution included major cities, inner regions, and outer/remote areas.

### Demographic Influences

**Age Distribution:** Screening uptake did not significantly vary by age, but older women showed a higher incidence of abnormal results. The majority of participants were between 30 and 49 years old. A larger proportion of women were aged 20–29 years in the weighted sample (25.7%) compared to the unweighted sample (20.1%). Younger women (20–29 years) were more likely to be over-screened, while those in the 50–59 age range were more likely to be regularly screened.

**Educational and Marital Status:** Higher educational attainment correlated with increased screening participation and knowledge. Most women had more than a secondary school education, with 67.1% holding a bachelor's degree or higher. Higher educational attainment and being married were positively associated with regular screening practices.

**Socio-Economic factors:** Women from higher socioeconomic quintiles had higher screening rates and better outcomes. The distribution showed significant proportions in the fifth quintile (least disadvantaged) with 30.3% in the weighted sample. Women from lower socio-economic quintiles were more likely to be under-screened. Socioeconomic status played a major role in screening uptake. Women from lower-income backgrounds faced greater challenges, including financial constraints and limited access to healthcare. Education levels also impacted awareness and attitudes toward screening.

**Healthcare Infrastructure:**

The healthcare infrastructure in Nairobi County showed variability in quality and availability of screening services. Some facilities were well-equipped and efficient, while others struggled with resource constraints and staff shortages. The lack of a cohesive screening program and inadequate follow-up mechanisms further compounded the issue.

**Cultural and Social Influences:**

Cultural beliefs and social norms also influenced screening behaviors. Stigma associated with cervical cancer and screening procedures deterred some women from seeking care. Community support and family involvement were found to affect screening decisions.

**Regional Differences:** Urban women had higher screening rates compared to those in rural or remote areas.

**Locality:** Most women lived in major cities (44.5% in the weighted sample) followed by inner regional areas (30.6%).

**Screening Uptake**

Overall, 60% of women reported having undergone a Pap smear at least once. Regular screening was more prevalent among women in urban areas and those with higher educational attainment. The prevalence of abnormal Pap smear results was 15%, with a higher percentage observed among women with lower educational levels.

**Overall Screening:** 94.5% of women had undergone a Pap smear. However, 81.5% reported their last screening was over two years prior to the study.

**Abnormal Results:** Approximately 30.4% of women reported having an abnormal Pap smear result.

**Smoking:** Smokers had a higher proportion of abnormal Pap smear results compared to non-smokers.

**Knowledge and Awareness on Cervical Cancer and Pap Smear**

Knowledge of cervical cancer and the Pap smear test was relatively high, with 55% of women possessing above-average knowledge. Awareness was significantly associated with higher screening rates, indicating that better-informed women are more likely to participate in screening programs. Awareness of cervical neoplasm and the importance of screening was generally low. Many women lacked detailed knowledge about screening procedures and benefits. Education campaigns were found to be insufficiently targeted and lacking in reach.

**Understanding of Pap Smear:** Most respondents (71.3%) correctly identified that Pap smears test for irregular cells. However, knowledge about what constitutes abnormal results was less clear, with only 48.7% correctly defining it as abnormal or precancerous cells.

**Screening Frequency:** Most respondents (71.0%) had undergone only one Pap smear test. 71.3% of respondents believed that Pap smears should be performed bi-annually.

**Recommended Age:** 59.3% thought screening should start immediately upon becoming sexually active, while 10.7% correctly identified that screening should continue until 70 years of age or older.

**Accessibility:**

Accessibility to screening services was a significant barrier. Women reported difficulties in reaching screening facilities due to transportation issues, long waiting times, and limited availability of services in certain areas. The cost of screening was also a concern for many women, affecting their ability to participate.

Table 4. 1: Features of respondents sampled from the study area (n=300)

SOCIO-DEMOGRAPHIC FEATURES	UNWEIGHTED		WEIGHTED	
	N = 300	%	N=297	%
<b>Age (10-year age groups)</b>				
20–29	60	20.1	76	25.7
30–39	70	23.3	74	25.0
40–49	67	22.3	67	22.5
50–59	64	21.3	49	16.4
60–69	39	13.0	31	10.4
<b>Locality</b>				



Remote, very remote	9	3.1	8	2.8
Outer regional	70	23.2	66	22.1
Inner regional	99	33.1	91	30.6
Major cities	122	40.6	132	44.5
<b>Socio-economic Status</b>				
First quintile (most disadvantaged)	76	25.2	51	17.2
Second quintile	68	22.8	53	17.8
Third quintile	36	12.1	46	15.5
Fourth quintile	49	16.2	57	19.2
Fifth quintile (least disadvantaged)	71	23.7	90	30.3
<b>County of Birth</b>				
Mombasa	15	4.9	13	4.5
Kiambu	14	4.8	14	4.8
Other	26	8.8	28	9.5
Nairobi	244	81.4	241	81.1
Refused to answer	1	0.1	1	0.1
<b>Highest level completed at school</b>				
Never attended	1	0.3	1	0.3
Below 10 <sup>th</sup> year	23	7.8	18	6.2
10th years	88	29.2	78	26.1
More than 10 <sup>th</sup> years	187	62.3	199	67.1
Don't know/not stated	1	0.4	1	0.3
<b>Post school qualifications b</b>				
Yes	178	59.4	183	61.6
No	122	40.6	114	38.4
<b>Post school qualifications - stated</b>				
Certificate or diploma	190	63.3	177	59.6
Undergraduate degree or advanced	108	35.9	117	39.5
Don't know/ not stated	2	0.8	3	0.9
<b>Educational attainment</b>				
Primary school	68	22.5	57	19.3

Secondary school	51	17.1	55	18.5
Certificate or diploma	119	39.7	115	38.7
Bachelor degree or higher	62	20.7	70	23.5
<b>Marital status</b>				
Never married	31	10.3	40	13.5
Married	178	59.3	167	56.2
Defacto	53	17.7	58	19.5
Separated/divorced/widowed	38	12.7	32	10.8
<b>Children</b>				
No	75	25.1	87	29.2
Yes	225	74.9	210	70.8
<b>Smoking Status</b>				
Current smoker	60	20.0	58	19.6
Past smoker	77	25.8	73	24.7
Never smoked regularly	162	54.1	165	55.6
Refused to answer	1	0.1	1	0.1

#### Response Rate

The study attained a response rate of 100%, which was considered sufficient according to Kothari (2009).

#### Respondent's socio-demographic features

The unweighted sample for women had an average weight of 42.6 years and a standard deviation of 13.03; 46% of women reporting to be between 30 and 49 years old. A good proportion of women (46%) lived in urban areas with 25 % reporting to be living in socially and economically disadvantage urban areas. The study also found majority of these respondents had been born in Nairobi City, 59% were in a marriage relationship. The study further records that 75% of women had children during the study period. The study also examined level of education attained by the respondents and observed that majority had attained above primary school certificate level of education with only 22.5% reporting to have mere primary certificate; 17.1%, 39.7%, and 20.7% had attained secondary, certificate or diploma and bachelor's degree or higher degree as their highest level of education respectively.

#### Representativeness

The study weighted the sample with respect to the population statistics on the age, locality, and smoking status showing that a larger proportion of the participants were aged 30 years and above (Table 4.1). For weighted samples, 81.1% lived in Nairobi as opposed to 81.4% of the unweighted sample. Consequently, those who had children dropped to 70.8%

when the sample was weighted. For the respondents who had gone past secondary school, those who had certificate or diploma decreased to 59.6% while those who had attained a bachelor's degree or higher qualification increased to 39.5% as shown in table 4.1.

#### Knowledge and Perceptions on Cervical Cancer Screening

The study also analysed the history of respondents regarding their screening history for cervical malignancy. The study sought to gather respondents' perception and knowledge on the subject of cervical cancer. The study particularly focused on screening history, frequency of screening, last screening prior the study, intervals between the screening, usual time between the Pap smear, and the number of times the respondents had Pap smear as shown in **table 4.2**.

**Table 4. 2: History of Cervical Malignancy Screening in Women, (N=300)**

Screening history	N = 300a	%
Ever had a Pap smear.		
Yes	284	94.5
No	15	5.1
Not sure	1	0.2
Don't know about this test	1	0.3

Screening History		
Never had a Pap smear	14	4.7
One test	10	3.4
1 to 2 years	23	7.8
2 and above 2 years	245	81.5
refused to answer /Don't know	8	2.6
Last Pap smear b		
Less than one year ago	10	3.4
Between 1 and 2 years ago	10	3.4
Between 2 and 3 years ago	39	13.1
Between 3 and 5 years ago	104	34.5
5 yaers or more ago	136	45.3
Don't know	1	0.3
Usual time between Pap smears b		
1 or below 1 year	7	2.3
Above 1 year but less than 2 years	8	2.7
Above 2 years but less than 3 years	7	2.3
4 or above 4 years	11	3.7
Had 1 test only	213	71.0
Had no regular test/other	49	16.3
Don't know/refused	5	1.7

Number of times had Pap smear b		
1 time	213	71.0
2 times	34	11.3
3–5 times	16	5.3
6–8 times	14	4.7
9–10 times	13	4.3
More than 10 times	4	1.3
Don't know/don't remember	5	1.7
Refused to answer	1	0.3

**a Weighted sample N = 300**

**Personal Cervical Screening History**

The study found majority of women who took part (94.5%) had attended cervical malignancy screening prior to the study period. The study further reported that majority of women (81.5%) had Pap smear/ screening 2 or more than 2 year prior the study. Most of the participants (45.3%) reported that the last pap smear was conducted 5 or more than 5 years prior to the study. Regarding the number of test, the study found 71.0% had undertaken only 1 test prior to the study period. The study further found that 71% had Pap smear 1 time only by the time this study was conducted.

The study also examined the cervical status with respect to features of the studied sample. The frequency of the screening was categorized in three; under-screening, regular screening, and over-screening. This section also presents the test of association between cervical screening and various features of the respondents. These results are presented in table 4.3 below.

**Table 4. 3: Cervical Status and Characteristics in a Sample of 300a (N = 300)**

	Under		Regularly		Over		X2 c	Valued
	screened		Screened		Screened			
	N	%	N	%	N	%		
	<b>210</b>	<b>70.0</b>	<b>54</b>	<b>18.0</b>	<b>36</b>	<b>12.0</b>		
Age							11.14	0.16
20–29	39	18.6	11	20.4	10	27.8		
30–39	52	24.8	11	20.4	7	19.4		
40–49	50	23.8	11	20.4	6	16.7		
50–59	44	21.0	14	25.9	6	16.7		
60–69	25	11.9	7	13.0	7	19.4		
Locality							2.39	0.53





outer reg, rem, vremote	63	25.7	9	28.1	7	30.4		
major cities	103	42.0	12	37.5	7	30.4		
inner regional	79	32.2	11	34.4	9	39.1		
Socio-economic status							14.19	0.03
First quintile (disadvantaged)	57	27.3	9	16.7	10	27.0		
Second quintile	53	25.4	9	16.7	6	16.2		
Third quintile	17	8.1	11	20.4	8	21.6		
Fourth quintile	33	15.8	10	18.5	6	16.2		
Fifth quintile (disadvantaged)	49	23.4	15	27.8	7	18.9		
Educational attainment							8.02	0.41
Primary school only	52	22.9	9	20.9	7	23.3		
Completed secondary school cert or diploma	32	14.1	11	25.6	8	26.7		
Bachelors Degree or higher	99	43.6	13	30.2	7	23.3		
Marital status	44	19.4	10	23.3	8	26.7		
never married							35.38	<0.02
married	5	2.3	11	22.9	15	40.5		
defacto	162	75.3	10	20.8	6	16.2		
sep/div/wid f	32	14.9	15	31.3	6	16.2		
Had children	16	7.4	12	25.0	10	27.0		
No							10.37	0.02
Yes	52	20.1	13	54.2	10	58.8		
Smoking status	207	79.9	11	45.8	7	41.2		
Yes							10.52	<0.03
No	37	14.3	12	52.2	11	64.7		
	222	85.7	11	47.8	6	35.3		

## Discussion

The study highlights that while there is a reasonable level of awareness about cervical cancer and Pap smears among Kenyan women, significant barriers to screening persist. The association between higher education and better screening outcomes underscores the need for targeted educational initiatives. Socioeconomic factors and regional disparities continue to impact screening accessibility and effectiveness.

The findings highlight significant gaps in both screening practices and knowledge about cervical cancer among Kenyan

women. Despite high awareness and initial screening rates, the frequency of screenings and follow-up practices need improvement. The study underscores the need for targeted educational programs and improved access to regular screening services, particularly for lower socio-economic groups and younger women.

### Barriers and Solutions

Addressing barriers such as financial constraints, lack of information, and logistical issues is crucial. Public health campaigns and community-based educational programs can

improve awareness and encourage regular screening (Garcia et al., 2020). Expanding healthcare infrastructure in underserved areas and providing subsidized screening services can enhance accessibility (Mwangi et al., 2016).

### Policy Implications

The findings suggest that national health policies should focus on integrating comprehensive cervical cancer prevention programs, including regular Pap smear screenings, into primary healthcare services. Strengthening collaboration between government agencies, non-governmental organizations, and local communities is essential for effective implementation (Bourke et al., 2018).

### Recommendations

**Increase Awareness:** Develop targeted educational programs to increase awareness about cervical neoplasia and the benefits of screening. Utilize community-based approaches to reach underserved populations. Launch national campaigns to educate women about the importance of regular Pap smears and cervical cancer prevention (Naylor et al., 2015).

**Improve Accessibility:** Expand the availability of screening services, particularly in underserved areas. Implement mobile screening units and subsidize costs to reduce financial barriers. Improve transportation options and streamline the screening process to reduce waiting times. Expand screening programs to rural and underserved areas, and provide financial assistance for low-income women (Mwangi et al., 2016).

**Enhance Education:** Integrate cervical cancer education into school and community health programs to raise awareness from a young age (Garcia et al., 2020). Strengthen Healthcare Infrastructure: Invest in healthcare facilities and training to improve the availability and quality of cervical cancer screening services (Bourke et al., 2018).

#### Address Socioeconomic Disparities:

Develop initiatives to support low-income women, such as subsidized or free screening programs and financial assistance for transportation and other related costs.

#### Strengthen Healthcare Infrastructure:

Invest in healthcare facilities and training for staff to improve the quality and efficiency of screening services.

Implement robust screening and follow-up programs to ensure comprehensive care.

#### Cultural Sensitivity:

Address cultural and social barriers through community engagement and support programs. Promote positive attitudes towards screening and reduce stigma associated with cervical cancer.

### Conclusion

Cervical neoplasia screening using Pap smears is a critical component of cervical cancer prevention in Kenya. While awareness levels are improving, substantial barriers to screening persist, particularly among women from lower socioeconomic backgrounds and rural areas. Addressing these

barriers through targeted education and improved access to healthcare services is essential for increasing Pap smear utilization and reducing cervical cancer incidence. While Pap smear screening is a proven method for early detection of cervical cancer, several factors impact its utilization in Kenya. Socio-economic status, educational level, and geographic location significantly influence screening practices. Improving access to screening services, enhancing public education, and addressing socio-economic barriers are crucial steps in increasing the effectiveness of cervical cancer prevention efforts in Kenya. This study reveals a high initial uptake of Pap smear screening among Kenyan women but identifies critical areas for improvement in regularity and follow-up. Enhancing educational efforts about cervical cancer and optimizing screening practices are crucial steps towards reducing cervical cancer incidence and mortality in Kenya. Addressing the factors affecting cervical neoplasm screening knowledge in Nairobi County requires a multifaceted approach. By improving awareness, accessibility, and healthcare infrastructure while addressing socioeconomic and cultural barriers, screening programs can become more effective, ultimately reducing the incidence and mortality of cervical cancer in the region.

### References

1. American Cancer Society. (2022). Cervical Cancer Early Detection. Retrieved from <https://www.cancer.org/>
2. Karanja, S., Odhiambo, F., & Gikonyo, J. (2017). Factors influencing cervical cancer screening among women in Nairobi. *Journal of Cancer Research and Practice*, 4(2), 45-52.
3. Kenya Ministry of Health. (2020). National Cervical Cancer Screening Program: Annual Report. Nairobi: Ministry of Health.
4. Kigen, N., Wambui, M., & Gikonyo, C. (2017). Socio-economic factors affecting cervical cancer screening in Kenya. *Journal of Global Health*, 7(1), 112-119.
5. Muriithi, S., Njenga, F., & Macharia, J. (2019). Barriers to cervical cancer screening in rural Kenya: A qualitative study. *African Journal of Health Sciences*, 8(3), 142-150.
6. Ndugwa, C., Mutua, M., & Onyango, T. (2018). Cultural beliefs and cervical cancer screening in Kenya: A systematic review. *East African Medical Journal*, 95(12), 1120-1126.
7. Nyakundi, D., Omondi, P., & Wanyama, R. (2022). Knowledge and perceptions of cervical cancer screening among women in Kenya. *Journal of Public Health Research*, 11(2), 87-95.
8. Ouma, C., Mbatia, J., & Akinyi, J. (2020). Economic barriers to cervical cancer screening in Kenya. *International Journal of Gynecology and Cancer*, 30(5), 746-752.
9. Wangari, E., Kabiru, E., & Njeri, K. (2021). Educational attainment and its impact on cervical cancer screening practices in Kenya. *BMC Public Health*.



- Health, 21, 1503. World Health Organization. (2021). Global Cancer Observatory: Cervical Cancer in Kenya. Retrieved from <https://gco.iarc.fr/>
10. Kothari, C.R. (2009). *Research Methodology: Methods and Techniques*. New Age International Publishers.
11. Bourke, L., et al. (2018). "Socioeconomic Factors and Cervical Cancer Screening Participation: A Review of the Evidence." *International Journal of Public Health*, 63(6), 737-746. <https://doi.org/10.1007/s00038-018-1144-4>
12. Garcia, R. L., et al. (2020). "Awareness and Knowledge of Cervical Cancer and HPV: A Comprehensive Review." *Cancer Prevention Research*, 13(2), 147-156. <https://doi.org/10.1158/1940-6207.CAPR-19-0160>
13. Koss, L. G., et al. (2014). "Knowledge and Attitudes towards Cervical Cancer Screening in Low-Income Women: A Survey Study." *American Journal of Preventive Medicine*, 46(4), 451-458. <https://doi.org/10.1016/j.amepre.2013.11.001>
- Muriithi, J., et al. (2018). "Cultural Influences on Cervical Cancer Screening in Kenya: A Qualitative Study." *Health Policy and Planning*, 33(3), 425-432. <https://doi.org/10.1093/heapol/czx177>
14. Mwangi, M., et al. (2016). "Barriers and Facilitators to Cervical Cancer Screening in Kenya: A Review." *International Journal of Gynecological Cancer*, 26(6), 1132-1140. <https://doi.org/10.1097/IGC.0000000000000712>
- Naylor, N., et al. (2015). "Increasing HPV Vaccine Coverage through Targeted Health Education Programs." *Preventive Medicine Reports*, 2, 371-378. <https://doi.org/10.1016/j.pmedr.2015.06.004>
15. World Health Organization. (2021). "Global Strategy to Accelerate the Elimination of Cervical Cancer as a Public Health Problem." Retrieved from WHO website