

Predictors of Cervical Cancer Screening Uptake among Healthcare Providers in Siaya County, Kenya

Zilper A. Imbuye¹, Damaris A. Ochanda², John O. Arudo³

¹School of Nursing, Midwifery and Paramedical Sciences, Masinde Muliro University of Science and Technology, Kakamega, Kenya.
e-mail: zilperimbuye@gmail.com

²Department of Nursing Research, Education & Management, School of Nursing, Midwifery and Paramedical Sciences, Masinde Muliro University of Science and Technology, Kakamega, Kenya.

e-mail: dochanda@mmust.ac.ke

³Department of Nursing Research, Education & Management, School of Nursing, Midwifery and Paramedical Sciences, Masinde Muliro University of Science and Technology, Kakamega, Kenya.

e-mail: jarudo@mmust.ac.ke

Received June 9, 2024, accepted August 27, 2024, Published October 1, 2024.

ABSTRACT

Context: Cervical cancer ranks as the second most frequent cancer among women in Kenya and the second most frequent cancer among women between 15 and 44 years of age. Cases of cervical cancer among health professionals have equally been on the rise.

Aim: This study sought to establish the proportion of healthcare providers who have undergone cervical cancer screening and examine individual and health system predictors that influence cervical cancer screening uptake among healthcare providers.

Methods: The study was conducted in Siaya County hospitals and adopted analytical cross-sectional study design. Quantitative data was collected using a structured self-administered questionnaire from 186 healthcare providers working at six level four hospitals in Siaya County. In addition, key informant interviews were conducted involving the in charge (6 healthcare providers) of the six hospitals selected. SPSS software version 28 was used for statistical analysis of quantitative data at 95% CI; $p = 0.05$. Multivariate logistic regression analysis was done for all the independent variables with $p < 0.02$ in the model to determine predictors of uptake of cervical cancer screening. Qualitative data were organized into themes and coded according to the study objectives.

Results: The results show that only 77.4% of the healthcare providers had gone for the screening. There was a significant association (OR: 0.4; 95% CI: 0.2 – 0.8; $p = 0.009$) between age and uptake of cervical cancer screening. Further results showed that perceived susceptibility (OR: 0.2; 95% CI: 0.1 – 0.6; $p = 0.003$) and self-efficacy (OR: 0.3; 95% CI: 0.1 – 0.6; $p = 0.0008$) significantly associated with the uptake of cervical cancer screening services. As for the health system predictors that influence the uptake of cervical cancer screening, availability of transportation (OR: 4.4; 95% CI: 1.5 – 13.2; $p = 0.004$) and acceptability (OR: 5.0; 95% CI: 1.7 – 15.0; $p = 0.001$) had a significant association with the uptake of cervical cancer screening services.

Conclusion: Only 77.4% of healthcare providers have been screened for cervical cancer. Perceived susceptibility, self-efficacy, availability of transportation, and acceptability were the main predictors of uptake of cervical cancer screening services. The study recommends routine awareness and sensitization programs about cervical cancer screening among healthcare providers on special days.

Keywords: Cervical cancer screening, healthcare providers, predictors, Siaya County

Citation: Imbuye, Z. A., Ochanda, D. A., & Arudo, J. O. (2024). Predictors of cervical cancer screening uptake among health care providers in Siaya County, Kenya. *Evidence-Based Nursing Research*, 6(4), 41-53. <http://doi.org/10.47104/ebnrojs3.v6i4.354>

1. Introduction

Cervical cancer is among the most lethal malignancies that affect women, with more than 200,000 new cases diagnosed in 2018 alone globally (Keah *et al.*, 2020). The 5-year prevalence of women globally living with cervical cancer is 22.6 per 100,000. Studies by Ngugi *et al.* (2012) highlight a disturbing trend. Cervical cancer diagnoses are rising globally, with women in developing regions like sub-Saharan Africa disproportionately affected.

Global efforts to combat this disease have grown significantly in recent years. These commitments take many forms, including developing safe and effective Human Papilloma Virus (HPV) vaccines (Oyekale, *et al.*, 2022). The World Health Organization (WHO) has played a key role in this progress, issuing a position paper on HPV vaccines and

advocating for action through the 2011 Political Declaration on non-communicable diseases (NCDs). The fight against cervical cancer has also been bolstered by the WHO's 2014 guidelines on cervical cancer screening. These guidelines provide crucial early detection recommendations for successful treatment (Keah, *et al.*, 2020).

The third Sustainable Development Goal (SDG) further underscores the global commitment to tackling NCDs. This goal aims to reduce premature mortality from NCDs, including cervical cancer, by one-third by 2030. These combined efforts represent a powerful force in the fight against this devastating disease (Keah, *et al.*, 2020).

Despite many studies on cervical cancer screening coverage, no single study addresses coverage among

¹Correspondence author: Zilper A. Imbuye

healthcare professionals (Lukorito et al., 2018). Studies in Siaya County have majored in the general population, with no specification on healthcare providers.

2. Significance of the study

Incidents of late diagnosis among healthcare providers that lead to deaths have been reported in major hospitals Counties in Kenya, Siaya inclusive (Keah et al., 2020). Further studies carried out in Siaya County regarding the uptake of screening for cervical cancer have only majored on the general population. This study, therefore, is timely and has the potential to contribute towards understanding predictors of uptake of cervical cancer screening services among healthcare providers in Siaya County. Such information benefits healthcare professionals, their leadership, members of the public, policymakers, and scholars in the nursing sector and medical fraternity in general.

Notably, establishing the predictors of uptake of cervical cancer screening among healthcare professionals is an important step towards establishing the reasons for low uptake of such screening services and thereby recommending appropriate measures that can be used by healthcare professionals together with its leadership, members of the public, policymakers, and scholars in the nursing sector and medical fraternity, in general, to improve on the prevention and early detection of cervical cancer and reduce cases of further complications and deaths associated with the disease. This study is essential as it provides information necessary for national policy formulation on how the uptake of cervical cancer screening services can be improved among healthcare providers and the general public. The study also adds to the available scholarly literature on the topic and, therefore, can always be used as a reference source by other future scholars.

3. Aim of the study

This study aimed to specifically establish the proportion of healthcare providers who have undergone cervical cancer screening and examine individual and health system predictors that influence cervical cancer screening uptake among healthcare providers.

4. Subjects & Methods

4.1. Research Design

A cross-sectional analytical research design was adopted for this study, involving both quantitative and qualitative methodologies. The study design was considered most appropriate for studying a large population within a short period. This study involved a sample of healthcare providers (clinical officers, medical officers, and nurses) working in level four hospitals in Siaya County. The selected sample voluntarily helped to answer research questions.

4.2. Study setting

This study was done in six level four public hospitals (Ambira, Madiany, Yala, Siaya County Referral, Bondo, and Ukwala) in Siaya County. These hospitals are the sub-county referral hospitals drawn from the six sub-counties of the

greater Siaya County: Ugunja, Rarieda, Gem, Alego Usonga, Bondo, and Ugenya. Siaya County lies approximately 0° 26' South to 0° 18' North and 33° 58' to 34° 33' East. It has a population of 933,343. Approximately 89% of the residents dwell in rural areas. The common economic activities in the county include fishing, subsistence farming, rice farming, livestock keeping, and small-scale trades. The county's only major public hospitals, the six hospitals offer cervical cancer screening and diagnosis (Kenya National Bureau of Statistics (KNBS), 2019).

4.3. Subjects

The study focused on healthcare providers, including clinical officers, medical officers, and nurses working in level four hospitals (Ambira, Madiany, Yala, Siaya County Referral, Bondo, and Ukwala hospitals) in Siaya County. It was informed by the fact that it is only level four hospitals within the county that have a cadre mix. Other levels, health centers, and dispensaries mainly comprise nurses only, and thus, such would have limited the study participants to only nurses.

Inclusion criteria

- Healthcare providers (clinical officers, medical officers, and nurses) who had worked in the level four health facility for more than three months.
- Healthcare providers working in level four hospitals in Siaya County who gave informed consent to participate in the study.

Exclusion criteria

- Healthcare providers who did not give their consent to participate in the study
- Healthcare providers who met the inclusion criteria but were not on duty during the data collection period.

Sample size determination

This sample size was determined by using the Fisher's formula (Fisher & Yates, 1990):

$$n = \frac{z^2 pq}{d^2}$$

Where

z= standard normal deviate corresponding to 95% confidence level (=1.96)

n= the required minimum sample size (if the population is more than 10,000)

p= Estimated proportion of healthcare providers with training needs (Taken as 50% since it is unknown).

d= degree of accuracy; set as 0.05

n= $(1.96^2 \times 0.5 \times 0.5) / 0.05^2 = 384$

Cochran's correction formula was used to calculate the sample size since the population was less than 10,000. Whereby n_0 is 384, and N is 336 (the population of healthcare providers who are eligible to take part in the study)

$n = n_0 / [1 + \{(n_0 - 1) / N\}]$
 $= 384 / [1 + \{(383) / 336\}] = 179$

Plus 10% attrition= 197

Table (1): Proportionate allocation of sample per health facility.

Hospital	Population	Proportionate Sample
AMBIRA	26	$197 \frac{26}{336} = 15$
MADIANY	24	$197 \frac{24}{336} = 14$
YALA	43	$197 \frac{43}{336} = 25$
SCRH	141	$197 \frac{141}{336} = 84$
BONDO	73	$197 \frac{73}{336} = 42$
UKWALA	29	$197 \frac{29}{336} = 17$
TOTAL	336	197

Sampling Procedure

The study participants were selected using a stratified sampling strategy with each category of target population (Clinical officers, medical officers, and nurses) from the six four hospitals forming the strata. In stratified sampling, the population is divided into homogeneous subgroups called strata based on certain characteristics, such as cadre in this case. Using this strategy, the researcher selected sample respondents from the strata of cadres and hospitals where they work.

Simple random sampling was then applied to select respondents within individual stratum. The list of healthcare providers on duty was generated from the duty roster and assigned different numbers from the first to the last. A lottery method was then applied to generate numbers to participate in the study. It is important to note that the sampling process was done per cadre. If a selected healthcare provider declined to participate in the study, the nearest neighboring healthcare provider with an eligible qualification was approached for participation.

4.4. Tools of data collection

This study utilized two main research instruments: a structured questionnaire and a Key Informant Interview (KII) guide.

4.4.1. Structured Self-Administered Questionnaire

The Structured Questionnaire served as a key tool for data collection. This questionnaire, originally adapted from a study by *Mwangi (2017)* conducted among the general population, was modified to address the needs of healthcare providers in Siaya County. The modifications included adjusting the demographic section to reflect cadre-specific information and adapting questions to align with the study's objectives, which focused on assessing predictors of cervical cancer screening uptake among healthcare providers.

The questionnaire assessed the predictors of cervical cancer screening uptake among healthcare providers in Siaya County. It was structured into four main sections. The first section, which focused on socio-demographic information, consisted of seven closed-ended questions designed to capture data on respondents' cadre, years in service, gender, age, and other relevant demographic characteristics.

The second section had questions on the uptake of cervical cancer screening. The section aimed to establish the proportion of healthcare providers (prevalence) who uptake cervical cancer screening. The third section was aimed at

assessing individual predictors. It included Likert scale questions that evaluated factors influencing the uptake of cervical cancer screening services. This section was entirely developed based on the six constructs of health belief model (perceived barriers, perceived severity, perceived benefits, perceived susceptibility, self-efficacy, and cues to action). The Likert scale responses were scored from 1 to 5, with a score greater than or equal to 3 being treated as 'agreed' while less than three was treated as 'disagreed.'

The fourth section focused on health system predictors and contained ten multiple-choice questions. This section evaluated health system factors, such as the acceptability, accessibility, and affordability of screening services. The questionnaire was administered in English and was designed to be administered once to each study participant. Scoring for the questionnaire was structured such that each closed-ended question was assigned a specific score based on the response. For Likert scale questions, responses were scored from 1 (strongly disagree) to 5 (strongly agree). The total score for each section was calculated by summing the individual item scores, with higher scores indicating stronger predictors of screening uptake.

4.4.2. Key Informant Interview Guide

Another crucial tool used in this study was the Key Informant Interview (KII) Guide. This interview guide, developed by the researcher, was based on a thorough review of relevant literature and aligned with the study's specific objectives. The primary aim of the KII guide was to explore the health system factors that influence cervical cancer screening uptake among healthcare providers in Siaya County.

The guide was structured into two main parts. The first part, Introduction and Consent, and the second part (main question part) focused on Health System Factors and included seven open-ended questions. These questions aimed to gather detailed information on the availability of resources, the level of administrative support, and the institutional policies related to cervical cancer screening within the health facilities.

To ensure the validity of the KII guide, it was subjected to expert reviews involving three university professors specializing in health sciences research. The reviews confirmed that it adequately covered all relevant health system factors. Reliability was further enhanced by pretesting the guide in a different but similar setting, which allowed for adjustments based on feedback from the pilot.

The interview guide was administered in English and used once per key informant, who, in this case, was the in-charge or medical superintendent of the respective hospitals. Given that the KII involved qualitative data collection, responses were not scored in the traditional sense. Instead, the data was thematically analyzed to identify patterns and insights relevant to the study's research objectives.

4.5. Procedures

Ethical Considerations: Ethical clearance was sought first (reference number MMU/COR:403012 Vol 5(01)) from the Department of Nursing, MMUST. Additionally, a

research permit was obtained from NACOSTI. After that, the County health office –in Siaya sought a research permit. Ethical issues were strictly considered. The following ethical principles were equally adhered to:

- Informed Consent: Participants were asked to consent by writing their names before participating in the study.
- Autonomy: Participants participated voluntarily in the study and were free to withdraw from the study at any time without any consequences.
- Confidentiality/privacy: Throughout the study, participants were guaranteed anonymity and confidentiality to safeguard their privacy (Nyamasi, et al., 2020). Before their involvement in the study, informed consent was obtained from all participants, and the study's objectives were clearly explained to them.
- Beneficence: The principle of beneficence was enhanced as the participants were informed that there was no harm likely to arise from the study and that the study was only geared towards improving the uptake of cancer of the cervix screening.

First, six research assistants with qualifications of at least a diploma in health-related courses were recruited and trained for two days. The research assistant walked into different departments within the hospital, asked for consent from the departmental head, and then approached the eligible healthcare providers based on the list of participants generated from the sampling procedure explained above (clinical officers, medical officers, and nurses) and asked for their consent to take part in the study.

The research assistant then administered a questionnaire to the eligible healthcare providers who had agreed to participate in the study according to the sample size. The questionnaire was self-administered, that is, the research assistant gave the healthcare providers the questionnaire to fill by themselves and offered clarification when needed.

Data Management: All the questionnaires were reviewed for completeness and then stored in a safe folder and locked in the researcher's office to be accessed only by the researcher and supervisors.

Validity and Reliability of the Data Collection Tools: To ensure the validity of the data collection tools, they were subjected to expert review, confirming that they adequately covered all relevant aspects of research objectives and variables. Additionally, the supervisor thoroughly examined the instruments to verify their validity. Meticulous attention was given to structuring the instrument to address the study objectives and research inquiries to attain internal validity (Cohen et al., 2013)

Reliability: Before collecting data, pretesting of the questionnaires was done on 10% (18) of the sample in a similar population but in a different hospital in the neighboring county (Busia County referral hospital). Data completeness and consistency checks were done during the pretest, and necessary adjustments were made where deemed fit. A Cronbach's Alpha value of 0.78 was established during the pilot test of the reliability. Questions that appeared redundant and ambiguous during the pretest were revised accordingly. All these measures were undertaken to guarantee that the data gathered would yield consistent outcomes upon repetition. Triangulation, which involves the

utilization of multiple tools such as questionnaires and secondary literature in data collection, was employed to ensure the results' reliability.

Six Key Informant Interviews were conducted with the healthcare workers who were directly in charge of the operation of the various hospitals. The key informants were asked open-ended questions. Data was collected from May 1, 2023, to June 31, 2023.

4.6. Data analysis

Data was first edited for accuracy, readability, consistency, and completeness; thereafter coded and entered into a computer using the software SPSS (Statistical Package for the Social Sciences) version 28.0. The data was analyzed using descriptive and inferential statistics. The predictors for uptake of cervical cancer screening were determined using bivariate logistic regression and odds ratio used to assess the strength of the association. All statistical tests were performed at 0.05 significance level (95% confidence interval).

Multivariate logistic regression included all the independent variables with a p-value of < 0.02 in the model to determine predictors of uptake of cervical cancer screening. Qualitative data were organized into themes and coded about the study objectives. The qualitative data collected were analyzed through a thematic approach. The study adopted the guidelines prescribed by Braun and Clarkes for carrying out thematic analysis to analyze the qualitative data collected (Nowell & Albrecht, 2019). The main ideas gathered were organized into thematic areas. The results have been presented and discussed alongside the quantitative data.

5. Results

Table 2 shows the results on the socio-demographic characteristics of the respondents. Most of the healthcare workers who participated in the study were in the age group of 30–39 (47.3%), followed by the younger age group of 20–29 (31.3%) years and a mean age of 34.3±8.2 ranging from 24.0–55.0 years. Most were married (71.0%), with an average parity of 2.7±1.0. Most respondents were affiliated to protestant denominations (46.2%), with an equal proportion (75.3%) being diploma holders or nurses. The average years of service was 6.8±6.3 and ranged from 1.0–30.0 years.

Table 3 presents results on respondents' cancer screening status. The proportion of cancer of the cervix screening among the participants was 77.4% (n=144), with more than half (58.3%) being screened in a different facility from where they worked. The majority (77.8%) were offered screening services by their nursing colleagues and a few by clinical officers (15.3%) and medical officers (4.2%). Generally, decision to go for screening was self-initiated (91.7%), with the main type of cervical screening that was done being VIA/VILI (90.3%) and the least being HPV test (1.4%). The leading frequency preference of doing screening is five yearly (38.2%), followed by three yearly (36.0%).

Figure 1 displays the year study participants were last screened for cervix cancer. Nearly one-third (31.2%) were screened in 2021. Less than one in five were screened in

2019 (16.7%). There is a general increasing trend of uptake of cancer of the cervix screening from 2015 to 2021.

Individual predictors associated with cancer of the cervix screening uptake, Table 4 shows study findings on respondents' perceptions of the uptake of cancer of the cervix screening. A relatively smaller proportion of respondents perceived lack of time (35.5%) or the screening being expensive (14.0%). Again, only a minority did not perceive cancer of the cervix as a severe disease, as reported by 12.9% that cancer is not as severe as other diseases like HIV nor a serious disease in this region (11.8%).

Majority confirmed the benefits of cancer of the cervix screening by refuting the statements that they do not get the screening service when they need it (84.9%) or that cancer of the cervix screening cannot prevent one from developing the disease (66.7%). Regarding susceptibility to the disease, most respondents disagreed with the statements that they do not think it is important for healthcare providers to be screened for cancer of the cervix (92.5%), nor think they are susceptible to cancer of the cervix (89.3%).

On self-efficacy, 21.5% have never thought about cancer of the cervix screening, 41.9% feel embarrassed being examined in their private parts, and 38.2% were worried that they could be told that they have the disease. Results on cue-to-action statements reveal that 89.3% disagreed that their husband or partner could not approve it.

Table 5 shows bivariate analysis results on individual factors associated with cancer of the cervix screening uptake among healthcare providers. There was a statistically significant difference between the younger age group and older ones in terms of uptake of cancer of the cervix screening. Those aged between 20–29 years were 60% (OR= 0.4) less likely to have undergone screening (OR: 0.4; 95% CI: 0.2–0.8; $p=0.009$). On the contrary, the married were almost four times more likely to have been screened than those who were single or widows (OR: 3.8; 95% CI: 1.9–7.9; $p=0.0002$). Healthcare providers with at most two children were 70% less likely to have been screened (OR: 0.3; 95% CI: 0.2 – 0.7; $p = 0.004$).

Equally, having worked for less than six years was statistically associated with the uptake of cancer of the cervix screening. Those who worked for less than six years were 60% unlikely to have gone for cancer of the cervix screening (OR: 0.4; 95% CI: 0.2–1.0; $p= 0.04$). Although not statistically significant, healthcare providers with diploma were 60% less likely to have been screened for cancer of the cervix (OR: 0.4; 95% CI: 0.2–1.1; $p = 0.07$).

Table 6 presents predictors of cancer of the cervix screening among healthcare providers. After controlling for confounders, being married (AOR: 3.0; 95% CI: 1.23–7.43; $p=0.02$) and finding it hard to get transport to a hospital where screening is done (AOR: 18.6; 95% CI: 3.20 – 30.6; $p=0.001$) were positively associated with uptake of cancer of the cervix screening. Having worked for at least five years (AOR: 0.2; 95% CI: 0.08–0.75; $p=0.014$) and perceived self-efficacy (AOR: 0.2; 95% CI: 0.06–0.53; $p=0.002$) were negative predictors of uptake of cancer of the cervix screening.

Table 7 shows the analysis results of six Health Belief Model sub-domains based on the statements presented to healthcare providers under each sub-domain.

The comparison between the HBM parameters concerning the uptake of cancer of the cervix screening shows a statistically significant association between perceived susceptibility, perceived self-efficacy, and uptake of cancer of the cervix screening among the healthcare providers. Healthcare providers who agreed that they do not think it is important for healthcare providers to be screened for cancer of the cervix or that they do not think they are susceptible to cancer of the cervix were 80% less likely to have gone for cancer of the cervix screening (OR: 0.2; 95% CI: 0.1–0.6; $p=0.003$) compared to those who disagreed.

Similarly, healthcare providers who agreed that they had never thought about it, felt embarrassed being examined in their private parts, or were worried that they could be told that they have the disease (self-efficacy) were 70% less likely to have undergone screening for cancer of the cervix, unlike their counterparts who disagreed with the statement (OR: 0.3; 95% CI: 0.1–0.6; $p=0.0008$). Although not statistically significant, respondents who agreed that they do not get the screening service when they need it or that cancer of the cervix screening cannot prevent one from developing the disease were up to 1.3 times more likely to go for screening ($p = 0.53$). There was no significant association between perceived barriers ($p=0.56$), perceived severity ($p=0.40$), cue to action ($p=0.09$), and uptake of cervical cancer screening.

Health system predictors that influence cervical cancer screening uptake, Table 8 presents results on healthcare providers' views on the availability, acceptability, and affordability of cancer screening services in the study area. All the respondents confirmed that their hospitals have cancer screening services. Slightly more than a quarter (26.9%) agreed that it would be hard for them to get transport to go for screening in the hospital. Only a few respondents reported that their hospital has a special day for conducting cancer of the cervix screening (17.2%). The majority stated that the hospitals have the necessary equipment and materials for performing the cancer of the cervix screening services (93.6%), with 87.1% stating that equipment and materials for performing the cancer of the cervix screening services are in functional condition.

The majority agreed that they are given appropriate privacy as they are being examined at the health facility (98.9%) and that healthcare providers offering screening services are polite and approachable (97.8%). However, a smaller proportion accepted that hospitals have special days when they sensitize their staff about cancer of the cervix screening (29.0%). Generally, cervical screening in hospitals is free, as affirmed by most respondents (98.9%), making the services affordable (97.8%).

Table 9 presents the relationship between health system factors and cervical cancer screening uptake, focusing mostly on availability, acceptability, and uptake of cancer of the cervix screening. There were higher odds among respondents who agreed that getting transport to go for screening in the hospital would be hard compared to those

who disagreed (OR: 4.4; 95% CI: 1.5–13.2; p=0.004). Equally, respondents who affirmed that the hospital has special days when they sensitize their staff about cancer of the cervix screening were five times more likely to have been screened for cancer of the cervix (OR: 5.0; 95% CI: 1.7–

15.0; p=0.001). Though not statistically significant, healthcare providers whose hospitals had a special day for conducting cervix screening were up to 2.3 times more likely to have been screened for cervix cancer (p=0.13).

Table (2): Frequency and Percentage distribution of the Socio-demographic characteristics of the study participants (n=186)

Variable	Frequency(n)	Percent (%)
Age group in years		
20–29	58	31.3
30–39	88	47.3
40–49	20	10.7
≥ 50	20	10.7
Mean in years±SD		34.3±8.2
Range		24.0–55.0
Marital status		
Married	132	71.0
Single	46	24.7
Widow	8	4.3
Mean parity ± SD		2.7±1.0
Range		1–5
Religious affiliation		
Protestant	86	46.2
Catholic	82	44.1
Others	18	9.7
Highest level of education		
Certificate	4	2.1
Diploma	140	75.3
Higher Diploma / Degree	42	22.6
Cadre		
Nurse	140	75.3
Clinical Officer	46	24.7
Average years of service±SD		6.8±6.3
Range		1.0–30.0

Table (3): Frequency and percentage distribution of respondents’ cancer of the cervix screening status (n=186).

Variable	Frequency (n)	Percent (%)
Screened for cancer of the cervix		
Yes	144	77.4
No	42	22.6
Where screening was done		
The current facility where I work	60	41.7
A facility different from where I work	84	58.3
Who offered the screening services		
Nurse	112	77.8
Clinical Officer	22	15.3
Medical Officer	6	4.2
Others	4	2.8
Who prescribed		
Health provider	12	8.3
Self-initiative	132	91.7
What type of cancer of the cervix screening was done		
Pap Smear	10	6.9
HPV Test	2	1.4
VIA/VILI Test	130	90.3
Others	2	1.4
How often do you do or intend to do cancer of the cervix screening?		
Every year	24	12.9
Every three years	67	36.0
Every five years	71	38.2
Every ten years	10	5.4
Others	14	7.5

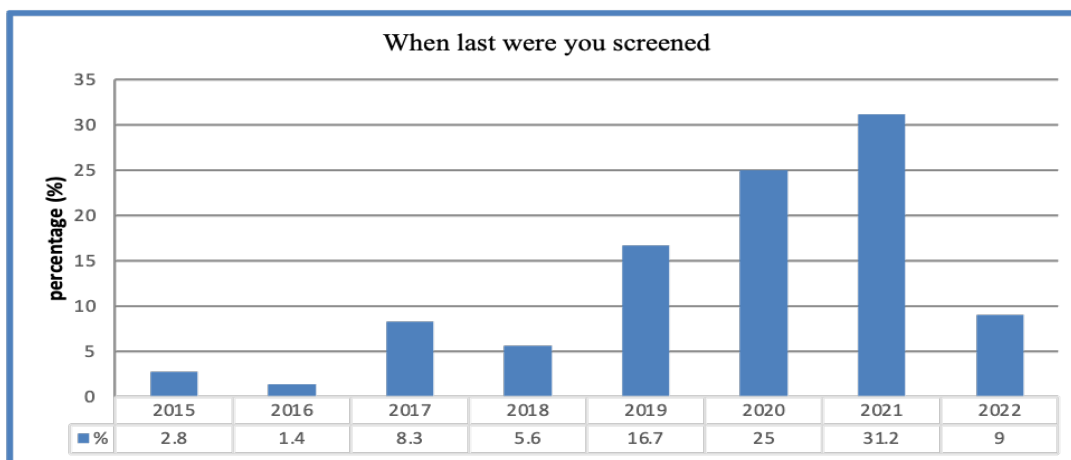


Figure (1): Percentage distribution of the last screened for cervix cancer (n=186).

Table 4: Frequency and percentage distribution of respondents' perceptions on cancer of the cervix screening as per the questionnaire (n=186).

Variables	Frequency (n)	Percent (%)
Perceived barrier		
Lack of time		
Agree	66	35.5
Disagree	120	64.5
Cancer of the cervix screening is expensive		
Agree	26	14.0
Disagree	160	86.0
Perceived severity		
Cancer is not as severe as other diseases like HIV		
Agree	24	12.9
Disagree	162	87.1
Cancer of the cervix is not a serious disease in this region		
Agree	22	11.8
Disagree	164	88.2
Perceived benefits		
I do not get the screening service when I need it		
Agree	28	15.1
Disagree	158	84.9
Cancer of the cervix screening cannot prevent one from developing the disease.		
Agree	62	33.3
Disagree	124	66.7
Perceived susceptibility		
I do not think it is important for healthcare providers to be screened for cancer of the cervix.		
Agree	14	7.3
Disagree	172	92.5
I do not think I am susceptible to cancer of the cervix		
Agree	20	10.7
Disagree	166	89.3
Self-efficacy		
I have never thought about it.		
Agree	40	21.5
Disagree	146	78.5
I feel embarrassed being examined in my private parts		
Agree	78	41.9
Disagree	108	58.1
I am worried that I can be told that I have the disease		
Agree	71	38.2
Disagree	115	61.8
Cue to action		
My husband or partner cannot approve of it		
Agree	20	10.7
Disagree	166	89.3

Table (5): Individual predictors associated with cancer of the cervix screening uptake among healthcare providers (n=186).

Independent variable	N	Uptake of Cervical Screening		OR	95% CI	P-value
		Yes	No			
Age group in years						
20–29	58	65.5	34.5	0.4	0.2–0.8	0.009
≥30	128	82.8	17.2			
Marital status						
Married	132	84.8	15.2	3.8	1.9–7.9	0.0002
Single, Widow	54	59.3	40.7			
Religion						
Protestants	86	79.1	20.9	1.2	0.6–2.4	0.62
Catholic, Others	100	76.0	24.0			
Parity						
≤2	79	67.1	32.9	0.3	0.2–0.7	0.004
≥3	107	85.1	15.9			
Qualifications						
Diploma	140	74.3	25.7	0.4	0.2–1.1	0.07
Certificate, Higher Diploma, Degree	46	87.0	13.0			
Cadre						
Nurse	140	77.1	22.9	0.9	0.4–2.1	0.87
Clinical Officer	46	78.3	21.7			
Years of service						
≤5	107	72.0	28.0	0.4	0.2–1.0	0.04
≥6	79	84.8	15.2			

Table (6): Predictors of cervical cancer screening uptake among healthcare providers (n=186).

Predictor	Estimate	AOR	95% CI	P-value
Age group				
≤ 29 years vs ≥ 30	0.15	1.2	0.35–3.91	0.80
Marital status				
Married vs Single, Widow	1.10	3.0	1.23–7.43	0.02
Parity				
≤ 2 vs ≥ 3	-0.54	0.6	0.22–1.57	0.28
Qualification				
Diploma vs Higher Diploma, Degree	-0.59	0.6	0.17–1.76	0.31
Years of service				
≤ 5 vs ≥ 3	-1.43	0.2	0.08–0.75	0.014
Perceived susceptibility				
Agreed vs Disagreed	-1.46	0.2	0.04–1.20	0.08
Perceived self-efficacy				
Agreed vs Disagreed	-1.70	0.2	0.06–0.53	0.002
Cue to action				
Agreed Vs Disagreed	-1.46	0.2	0.04–1.22	0.08
Hard for you to get transport to go for screening in the hospital				
Yes vs No	2.92	18.6	3.20–30.6	0.001
The hospital has special days when they sensitize their staff about cancer of the cervix screening.				
Yes vs No	0.69	2.0	0.33–12.29	0.45

Table (7): Relationship between healthcare providers’ behavior and cervical cancer screening uptake (n=186).

Independent variable	Categories	N	Uptake of Cervical Screening		OR	95% CI	P value
			Yes	No			
Perceived barriers	Agree	30	73.3	26.7	0.8	0.3–1.9	0.56
	Disagree	156	78.2	21.8			
Perceived severity	Agree	20	70.0	30.0	0.6	0.2–1.8	0.40
	Disagree	166	78.3	21.7			
Perceived benefits	Agree	42	80.9	19.1	1.3	0.6–3.1	0.53
	Disagree	144	76.4	23.6			
Perceived susceptibility	Agree	14	42.9	57.1	0.2	0.1–0.6	0.003
	Disagree	172	80.2	19.8			
Perceived self-efficacy	Agree	58	62.1	37.9	0.3	0.1–0.6	0.0008
	Disagree	128	84.4	15.6			
Cue to action	Agree	14	57.1	42.9	0.4	0.1–1.1	0.09
	Disagree	172	79.1	20.9			

Table (8): Frequency and percentage distribution of availability, affordability, and acceptability of cancer of the cervix screening services (n=186).

Variables	N	%
Availability		
The hospital has screening services		
Yes	186	100.0
No	0	0.0
Would it be hard for you to get transport to go for screening in the hospital?		
Yes	50	26.9
No	136	73.1
Does the hospital have a special day for conducting cancer of the cervix screening?		
Yes	32	17.2
No	154	82.8
Does the hospital have the necessary equipment and materials for performing the cancer of the cervix screening services?		
Yes	174	93.6
No	12	6.4
What are the conditions of these equipment and materials for performing the cancer of the cervix screening services?		
Functional	162	87.1
Dysfunctional	8	4.3
Unknown	14	7.5
Out of stock	2	1.1
Acceptability		
Given appropriate privacy as you are being examined		
Yes	184	98.9
No	2	1.1
Hospital has special days when they sensitize their staff about cancer of the cervix screening		
Yes	54	29.0
No	132	71.0
Healthcare providers offering screening services are polite and approachable		
Yes	182	97.8
No	4	2.2
Affordability		
How much is charged for cancer of the cervix screening		
Free	184	98.9
KSh. 500	2	1.1
Is the price quoted above affordable?		
Yes	182	97.8
No	4	2.2

5.1. Results from the qualitative data

Based on factors affecting uptake of cervical cancer screening among the healthcare providers, it was categorized into the following thematic areas:

Cervical cancer screening services Availability/Accessibility

The healthcare providers reported that all their staff know the need for cervical cancer screening. Moreover, the hospitals offer screening services through VIA/VILLI tests. One key informant explains that the screening is done throughout the week through a personal decision: "The facility offers screening throughout the week. It is an individual initiative to seek services" (KI, 3). The respondents outlined that the institutions do not create any awareness of the need for cervical cancer screening among their staff, and even those who seek such services do so through their initiatives.

Cervical cancer screening services affordability

Healthcare providers said cervical cancer screening services were free in public health facilities. As one key informant explained, "The facility offers screening services at no cost" (KI, 5).

Cervical cancer screening services acceptability

The providers reported that acceptability of the cervical cancer screening services was not a major problem in the study area. According to them, there were no major cultural, religious, or privacy issues related to the uptake of cervical cancer screening. The only problems were fear of possible positive test outcomes and lack of staff sensitization, among others, as one of the key informant respondents stated: "Some staff members claim there is pain as a result of the use of the speculum" (KI, 2). Others fail to seek screening services due to the stigma associated with the process.

Cervical cancer screening awareness and outreach services

All the key informants reported that lack of awareness among staff was a major challenge and had greatly contributed to some staff members not seeking screening services. The respondents outlined that the institutions do not create any awareness of the need for cervical cancer screening among their staff, and even those who seek such services do so through their initiatives. They emphasized that awareness creation would improve the statistics, as one of the key informants stated: "There is a need for CME Awareness creation through hospital WhatsApp group" (KI, 1).

Table (9): Relationship between health system factors and cervical cancer screening uptake (n=186).

Independent variable	N	Uptake of Cervical Screening		OR	95% CI	P-value
		Yes	No			
Availability						
Would it be hard for you to get transport to go for screening in the hospital?						
Yes	50	92.0	8.0	4.4	1.5–13.2	0.004
No	136	72.1	27.9			
Hospitals have a special day for conducting cancer of the cervix screening.						
Yes	32	87.5	12.5	2.3	0.7–6.9	0.13
No	154	75.3	24.7			
Hospitals have the necessary equipment and materials for performing cancer of the cervix screening services.						
Yes	77.0	23.0	54	0.7	0.1–3.2	1.00
No	83.3	16.7	66.6			
Conditions are these equipment and materials for performing the cancer of the cervix screening services						
Functional	162	77.8	22.2	1.2	0.4–3.1	0.76
Non-functional or out-of-stock	24	75.0	25.0			
Acceptability						
The hospital has special days when they sensitize their staff about cancer of the cervix screening						
Yes	54	92.6	7.4	5.0	1.7–15.0	0.001
No	132	71.2	28.8			
Affordability						
How much is charged for cancer of the cervix screening						
Free	184	98.9	2.1	4.3	0.5-3.4	0.77
KSh. 500	2	78	22			
Is the price quoted above affordable?						
Yes	182	97.8	77	4.1	1.6–14.0	0.68

The respondents felt cervical cancer screening services should be mandatory for all eligible healthcare providers to improve their uptake.

6. Discussion

Over the years uptake of cervical cancer screening services has remained poor despite all the studies on cervical cancer screening. This study sought to establish the proportion of healthcare providers who have undergone cervical cancer screening and examine individual and health system predictors that influence cervical cancer screening uptake among healthcare providers.

A significant portion, more than three-quarters of participating healthcare providers, reported being screened for cancer of the cervix, with most having undergone screening within the past three years. This finding could be attributed to several factors beyond individual motivations highlighted by the (*Centers for Disease Control and Prevention (CDC), 2018*). Firstly, healthcare professionals inherently possess greater knowledge about cervix cancer, including its causes, risk factors, and potential consequences. This heightened awareness may translate into a stronger sense of perceived susceptibility, motivating them to prioritize screening for themselves (*Nwabichie et al., 2018*).

Moreover, the finding aligns with research by *Oyekale et al. (2022)*, who reported a 75.3% screening rate among female healthcare workers in another region. Studies suggest nurses are the most frequent users of screening services (*Ayenew et al., 2020*), which aligns with the study results.

Centers for Disease Control and Prevention (CDC) (2018) highlights that individual motivations often drive the uptake of cancer of the cervix screening services, and our findings support this notion.

While many previous studies, e.g., *Devarapalli et al. (2018)*, described Pap tests as the most common screening method (using a tool to collect cervical and vaginal cells), the study revealed VIA/VILI testing as the predominant method used by participants (91.7%). This difference could be due to several factors, including regional variations in program implementation or healthcare provider preferences. Further investigation is warranted for this preference for VIA/VILI testing. Understanding these factors helps determine if educational efforts are needed to promote Pap testing as a viable and effective screening option or explore potential VIA/VILI testing advantages that warrant wider adoption.

However, a concerning finding was the reported frequency of screening. Many providers indicated undergoing screening only every five years or less frequently, which falls short of recommended intervals. Research by *Devarapalli et al. (2018)* suggests that healthcare providers and the general population should be screened more frequently every one to two years to effectively prevent cervix cancer. This discrepancy between knowledge and practice highlights the need for interventions that address potential barriers to more frequent screening among healthcare providers. Facilities with a strong focus on preventive healthcare practices and regular cancer screenings for patients may cultivate a culture of self-care

among staff. Observing colleagues prioritize their screenings and witnessing educational campaigns within the workplace could serve as social pressure, encouraging healthcare providers to adhere to recommended screening guidelines.

Age emerged as a significant factor regarding individual predictors associated with cervical cancer screening uptake among healthcare providers. Most participants aged 20-29 were less likely to have been screened than older colleagues. Marital status also played a role, with married providers nearly four times more likely to be screened than those who were single or widowed. These findings align with research by *Ifemelumma et al. (2019)*, who observed similar trends among female healthcare workers. *Dulla et al. (2017)* suggests that married providers, particularly as they age and gain experience, may become more comfortable with the screening process due to a perceived increased susceptibility to cancer of the cervix.

The number of children a provider had also influenced their screening likelihood. Those with two or fewer children were 70% less likely to have undergone screening than providers with more children. This finding could be attributed to the fact that those with less parity perceive themselves to be at less risk to cervical cancer. Years of service also showed a statistically significant association with screening uptake. Similar to *Ngutiku et al. (2021)*, our study suggests that longer service tenure may be linked to increased comfort with the screening process, potentially reducing embarrassment concerns.

Interestingly, the study found no significant association between educational qualifications, religion, or profession and screening uptake. The interpretation here could be that healthcare providers are fully informed about cervical cancer screening. This finding aligns with *Ifemelumma et al. (2019)*, who reported that a provider's specific healthcare profession did not influence their screening behavior. This finding might be because healthcare providers, regardless of their background, are already trained in medicine and possess knowledge about cancer of the cervix and screening. Therefore, their decision to be screened may be influenced by other factors.

Focusing on the Health Belief Model constructs, only perceived susceptibility and self-efficacy demonstrated a significant association with screening uptake. This finding could mean that only those who perceived to be susceptible and those with high self-efficacy would go for the screening. This finding supports the notion by *Nwabichie et al. (2018)* that lower perceived susceptibility and self-efficacy lead to decreased use of preventive care due to a perceived lower risk of developing cervix cancer and decreased ability to be committed to preventive health behaviors. Similarly, a study by *Keah et al. (2020)* at Kenyatta National Hospital revealed that some healthcare providers avoid screening due to the belief that they are not at risk or that cancer of the cervix is invariably fatal.

Self-efficacy, a person's confidence in their ability to perform a specific behavior, also played a role. Providers who had never considered screening felt embarrassed about the examination, or worried about a positive test result were less likely to undergo screening. These findings contradict research by *Ngutiku et al. (2021)*, who suggested that

education increases the uptake of preventive care. However, despite their medical training and knowledge about cancer of the cervix, some providers may still experience personal barriers related to self-efficacy that require further exploration. The assumption that all providers would have high self-efficacy due to their education level may not always hold true.

The study also examined the health system factors influencing the uptake of cervical cancer screening services (availability, affordability, and acceptability of screening services). Availability and acceptability emerged as significant factors impacting screening behavior.

The availability of screening services played a key role. Providers who reported difficulty accessing transportation to screening locations were less likely to be screened. Conversely, those who indicated that their hospitals offered dedicated days for staff education about cancer of the cervix screening were five times more likely to have undergone screening themselves. These findings align with research by *Ngutiku et al. (2021)*, who identified a lack of awareness campaigns and transportation barriers as major contributors to low screening rates among nurses at a Kenyan hospital. Similarly, *Becerra-Culqui et al. (2018)* found that geographical accessibility, affordability, and convenient service hours significantly influenced women's likelihood of being screened. Long travel distances, high costs, and limited clinic hours are documented barriers to screening uptake, particularly in rural and underserved areas (*Mboineki et al., 2020*).

Availability goes beyond the mere physical presence of screening services. Studies by *Nyamasi et al. (2020)* highlight the importance of ensuring sufficient healthcare personnel trained in conducting cancer of the cervix screening procedures. Inadequate staffing levels can lead to long wait times, discouraging potential participants. A study in Tanzania by *Nwabichie et al. (2018)* found that healthcare workers reported feeling overwhelmed due to high patient loads, hindering their ability to dedicate adequate time to each screening procedure. Similarly, a lack of essential equipment or supplies, such as functioning colposcopes or adequate quantities of Pap smears or VIA/VILI test kits, can disrupt service delivery and discourage uptake (*Mboineki et al., 2020*).

Furthermore, geographic accessibility plays a critical role in availability. Research by *Osazuwa-Peters (2013)* emphasizes the importance of offering screening services in convenient locations within communities, particularly in rural areas. Long travel distances can be a significant deterrent, especially for those with limited transportation options. Investing in mobile screening units or establishing satellite clinics in remote areas can bridge this gap and bring services closer to the populations most in need (*Osazuwa-Peters, 2013*). Additionally, promoting flexible clinic hours, including evenings and weekends, can cater to healthcare providers with busy work schedules. Weekend or after-hours screening opportunities can also address transportation challenges for those who rely on public transportation with limited operating hours.

Acceptability of screening services within the healthcare system also proved to be a significant factor.

Providers reported that their hospitals ensured patient privacy during examinations and that staff offering screening services were courteous and approachable. Overall, the general acceptability of screening services was not a major concern within the study area. Participants said cultural, religious, or privacy-related issues were not significant barriers. This finding aligns with research by Ugwu *et al.* (2013) in Nigeria, which identified service acceptability as an influencer of screening uptake among female healthcare workers. Becerra-Culqui *et al.* (2018) emphasize that acceptability within the health system is a crucial predictor of screening uptake. It encompasses a range of factors related to individual and community perceptions, attitudes, and beliefs regarding screening services.

While our study suggests cultural or religious barriers were not significant concerns in this region, such challenges can be prevalent in other settings. Research by Lewis, *et al.* (2020) in Malawi identified certain cultural beliefs associating cancer of the cervix with promiscuity, leading some women to forgo screening due to fear of stigma. Addressing these misconceptions through community education campaigns and engaging with religious leaders can be crucial for promoting the cultural acceptability of screening services (Lewis *et al.*, 2020). Additionally, a lack of female healthcare providers, particularly in gynecology or oncology, may deter some women from undergoing screening due to privacy concerns (Nyamasi, *et al.*, 2020).

7. Conclusion

The screening uptake was at around 77.4%. There was a significant association between age, marital status, parity, years of service, and the uptake of cervical cancer screening services. However, the study established no significant association between qualification, religion, profession, and the uptake of cervical cancer screening services. Regarding the health belief model constructs, only perceived susceptibility and self-efficacy had a significant association with the uptake of cervical cancer screening services. For instance, though the screening services were identified to be widely available, some individuals believed that they were not at risk of developing the disease (low perceived susceptibility). Some healthcare providers also reported that they feel embarrassed about the vaginal examination (low self-efficacy).

Availability and acceptability were the main health system predictors that had a significant association with the uptake of cervical cancer screening services. All the six level four hospitals in Siaya County offer cervical cancer screening services, during all the working hours of the week. Despite offering the services during their daily routines, hospitals do not have special days when they sensitize their staff about cervical cancer screening. Though not associated significantly with uptake, cervical screening services are free at the respective hospitals, indicating that the service is affordable. Acceptability of cervical cancer screening services is not a major problem in the study area as there are no major cultural, religious, or privacy issues related to the uptake of cervical cancer screening.

8. Recommendations

- There should be a deliberate effort to enhance uptake from 77.4% currently to 100%
- There is a need for special days awareness and sensitization programs on the susceptibility of healthcare providers to cervical cancer and the need for uptake of cervical cancer screening on a routine basis. These special days will eventually improve the individual predictors associated with cervical cancer screening uptake among healthcare providers in Siaya County.
- During the sensitizations, healthcare workers need to be informed that they are all susceptible to cervical cancer and, therefore, need to develop high self-efficacy in undertaking cervical cancer screening regularly.
- The Department of Health in the study area needs to establish routine health screening days per hospital to increase availability and uptake.

9. References

- Ayenew, A. A., Zewdu, B. F., & Nigussie, A. A. (2020). Uptake of cervical cancer screening service and associated factors among age-eligible women in Ethiopia: systematic review and meta-analysis. *Infectious Agents and Cancer*, 15(1), 67. <https://doi.org/10.1186/s13027-020-00334-3>
- Becerra-Culqui, T. A., Lonky, N. M., Chen, Q., & Chao, C. R. (2018). Patterns and correlates of cervical cancer screening initiation in a large integrated health care system. *American Journal of Obstetrics and Gynecology*, 218(4), 429.e1–429.e9. <https://doi.org/10.1016/j.ajog.2017.12.209>
- Centers for Disease Control and Prevention. (2018). Cervical cancer screening guidelines for average-risk women. <http://www.cdc.gov/cancer/cervical/pdf/guidelines.pdf>
- Cohen, J. (2013). *Statistical power analysis for the behavioral sciences*. Routledge. <https://doi.org/10.4324/9780203771587>
- Devarapalli, P., Labani, S., Nagarjuna, N., Panchal, P., & Asthana, S. (2018). Barriers affecting uptake of cervical cancer screening in low and middle-income countries: A systematic review. *Indian Journal of Cancer*, 55(4), 318–326. https://doi.org/10.4103/ijc.IJC_253_18.
- Dulla, D., Daka, D., & Wakgari, N. (2017). Knowledge about cervical cancer screening and its practice among female health care workers in southern Ethiopia: A cross-sectional study. *International Journal of Women's Health*, 9, 365–372. <https://doi.org/10.2147/IJWH.S132202>.
- Fisher, R. A., & Yates, F. (1990). *Statistical methods, experimental design, and scientific inference: A re-issue of statistical methods for research workers, the design of experiments, and statistical methods and scientific inference*. Oxford Scientific Publication. *Oxford University Press*. <https://doi.org/10.1093/oso/9780198522294.002.0003>
- Ifemelumma, C. C., Anikwe, C. C., Okorochukwu, B. C., Onu, F. A., Obuna, J. A., Ejikeme, B. N., & Ezeonu, O. P. (2019). Cervical cancer screening: Assessment of perception and utilization of services among health workers in low resource setting. *International Journal of Reproductive Medicine*, 2019(1), 6505482. <https://doi.org/10.1155/2019/6505482>

- Keah, M. M., Kombe, Y., & Ngure, K. (2020).** Factors influencing the uptake of cervical cancer screening among female doctors and nurses in Kenyatta National Hospital. *Journal of Cancer and Tumor International*, 10(3), 31-38. <https://doi.org/10.9734/jcti/2020/v10i330131>
- Kenya National Bureau of Statistics (2019).** Quality statistics for better lives. Available at: <https://www.knbs.or.ke/>
- Lewis, S., Moucheraud, C., Schechinger, D., Mphande, M., Banda, B. A., Sigauke, H., Kawale, P., Dovel, K., & Hoffman, R. M. (2020).** A loving man has a very huge responsibility: A mixed methods study of Malawian men's knowledge and beliefs about cervical cancer. *BMC Public Health*, 20(1), 1-12. <https://doi.org/10.1186/s12889-020-09552-1>
- Lukorito, J., Wanyoro, A., & Kimani, H. (2018).** Uptake of cervical cancer screening among HIV positive women in comprehensive care centres in Nairobi, Kenya. *Research in Obstetrics and Gynecology*, 5(1), 1-6. <https://doi.org/10.5923/j.rog.20170501.01>
- Mboineki, J. F., Wang, P., Dhakal, K., Getu, M. A., Millanzi, W. C., & Chen, C. (2020).** Predictors of uptake of cervical cancer screening among women in Urban Tanzania: Community-based cross-sectional study. *International Journal of Public Health*, 65(9), 1593-1602. <https://doi.org/10.1007/s00038-020-01515-y>
- Mwangi, J. H., Gachau, A. G., & Kabiru, E. W. (2017).** The levels of utilization of visual inspection screening of cervical cancer in Kitui, Kenya. *The East and Central Africa Medical Journal*, 3(1), 30-34. <https://doi.org/10.33886/ecamj.v3i1.34>
- Ngugi, C. W., Boga, H., Muigai, A. W., Wanzala, P., & Mbithi, J. N. (2012).** Factors affecting uptake of cervical cancer early detection measures among women in Thika, Kenya. *Health Care for Women International*, 33(7), 595-613. <https://doi.org/10.1080/07399332.2011.646367>
- Ngutiku, J. M., Mwenda, C. S. M., & Maranga, A. K. (2021).** Uptake of cervical cancer screening services among nurses working at Thika Level 5 Hospital. *East African Medical Journal*, 98(10), 4196-4205.
- Nowell, B., & Albrecht, K. (2019).** A reviewer's guide to qualitative rigor. *Journal of Public Administration Research and Theory*, 29(2), 348-363. <https://doi.org/10.1093/jopart/muy052>
- Nwabichie, C. C., Manaf, R. A., & Ismail, S. B. (2018).** Factors affecting uptake of cervical cancer screening among African women in Klang Valley, Malaysia. *Asian Pacific Journal of Cancer Prevention: APJCP*, 19(3), 825-831. <https://doi.org/10.22034/APJCP.2018.19.3.825>
- Nyamasi, M. M., Angira, C., & Owenga, J. (2020).** Determinants of uptake of cervical cancer screening services among women of reproductive age between 18-49 years of age in Bondo Sub County, Siaya County, Kenya. *International Research Journal of Advanced Engineering and Science*, 5(3), 51-55.
- Osazuwa-Peters, N. (2013).** Human papillomavirus (HPV), HPV-associated oropharyngeal cancer, and HPV vaccine in the United States—Do we need a broader vaccine policy?. *Vaccine*, 31(47), 5500-5505. <https://doi.org/10.1016/j.vaccine.2013.09.031>
- Oyekale, R. A., Wura, R., Oluseyi, A. O., Adeniran, G. O., Adesina, K. A., Adeyemo, M. O. A., Omotayo, D. T., Agboola-Bello, R. B., Olamide, A., & Adetunmiseoluseyi, O. (2022).** Predictors of cervical cancer screening service utilization among female health care workers in a tertiary hospital in Osogbo, Osun State. *African Journal of Reproductive Health*, 26(10), 94-100. <https://doi.org/10.29063/ajrh2022/v26i10.11>
- Ugwu, E. O., Obi, S. N., Ezechukwu, P. C., Okafor, I. I., & Ugwu, A. O. (2013).** Acceptability of human papillomavirus vaccine and cervical cancer screening among female healthcare workers in Enugu, Southeast Nigeria. *Nigerian Journal of Clinical Practice*, 16(2), 249-252. <https://doi.org/10.4103/1119-3077.110141>