Acceptability of Cervical Cancer Screening among Adolescent Girls and Young Women Living with HIV in Uasin Gishu County, Kenya

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Abstract

Background: Cervical cancer is a major cause of mortality among women living with HIV worldwide, especially among adolescent girls and young women (AGYW), who face a sixfold increased risk of Human Papillomavirus (HPV) infection with lower clearance rates compared to their HIV-negative peers. Despite the Ministry of Health recommendations for annual cervical cancer screening, only 23% of AGYW living with HIV in Uasin Gishu County have been screened. Identifying the client-level, healthcare worker, and service delivery factors that influence the uptake of cervical cancer screening could uncover barriers to acceptability.

Methodology: A cross-sectional study was conducted to gather data from 196 HIV-positive AGYW, with enrollment carried out via systematic random sampling between November and December 2023. Data were collected using a pre-tested, structured questionnaire and analyzed using R version 4.3.1, applying chi-square tests and multiple logistic regression to explore associations between variables.

Results: The study enrolled 168 AGYW, revealing that only 27% (46/168) had undergone cervical cancer screening. Key predictors of screening included familiarity with screening methods (AOR=4.71, 95% CI [1.71, 14.6], p=0.004), employment status (AOR= 7.45, 95% CI [2.47, 24.9], p<0.001), marital status (AOR=6.28, 95% CI [2.47, 24.9] p=<0.001), and gender preference for screening (AOR= 3.54, 95% CI [1.31, 10.2], p=0.015).

Conclusion: The findings highlight the low acceptability of screening, therefore calling for the Ministry of Health to employ client-focused, tailor-made interventions in alignment with the identified predictors of familiarity with screening approaches, marital status, and employment, which are key to increasing cervical cancer screening acceptability.

Keywords: *Adolescents, Girls and Young Women, HPV, Acceptability, Cervical Cancer Screening, HIV*

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Introduction

Cervical cancer is the fourth most common cause of cancer-related morbidity and mortality worldwide, responsible for approximately 662,000 new cases and 349,000 deaths in 2022 [1-3]. Despite being preventable, the disease claims the life of a woman every two minutes. Alarmingly, an estimated 94% of these deaths occur in Sub-Saharan Africa, where access to screening and treatment services is limited. In 2022, Kenya reported 5845 new cases and 3591 deaths, underscoring cervical cancer status as a significant public health burden in the country [3, 4]. The primary cause is persistent infection with high-risk Human Papillomavirus (HPV) 16 and HPV-18 subtypes, which account for 70% of the cases[5, 6]. While most HPV infections are asymptomatic and self-limiting, progression to cervical cancer is influenced by factors such as age, tobacco use, immunosuppression, early sexual debut, multiple sexual partners, and HIV co-infection [7, 8]. The HPV vaccine is effective in reducing the risk of HPV-associated cancers.

However, there remain concerns regarding not only policy response but also population response to HPV screening, vaccination, and treatment of HPV-related cancers [9].

Globally, women living with HIV (WLHIV) are six times more at risk of cervical cancer compared to the general population [10]. In particular, adolescent girls and young women show a four to six times higher risk of HPV-HIV co-infection, with the highest prevalence observed in those aged between 15 and 29 years [8]. In the national Kenya Population-based HIV Impact Assessment (KENPHIA) report 2018-2019, HIV prevalence among women was 6.6%, and these women were at a sixfold increased risk of human papillomavirus (HPV)-induced cancers [11]. Additionally, while the national policy recommends yearly screening for high-risk populations, the county reported a screening coverage of only 7% among this population[12, 13].

Females aged between 15 and 24 years living with HIV in Kenya, just like in other sub-Saharan countries, face considerable hurdles to accessing cervical cancer screening. These barriers include low education levels, poor socioeconomic status, lack of understanding of cervical cancer and HPV, discomfort with the screening methods available, HIV status, and clinical equipment, which may present difficulties for providers [12]. Additionally, obstacles such as sexism and gender-based violence, lack of access to healthcare, and policy information persist [14]. Furthermore, limited research exists regarding the Adolescent Girls and Young Women AGYW who live with HIV and their attitudes on cervical screening practices.

The Ministry of Health, Kenya, recommends the implementation of annual screening for eligible women living with HIV, with a target uptake [12], yet an examination of Cervical Cancer Screening rates among AGYW living with HIV in Uasin Gishu County, as of May 2023, demonstrated 23.9% (355/1484) [15]. This is severely lower than expected, despite the Uasin Gishu County's robust interventions to boost screening, such as free screening services, financial support, and free treatment. Researchers have not systematically examined service acceptance among AGYW. The aggregated results within program reports remain uninformative since they do not break down individual outcomes. Consequently, this research initiative focused on determining factors associated with AGYW living with HIV to accept cervical cancer screening services.

Methodology

Study design

A cross-sectional study design was used to determine the acceptability of cervical cancer screening among the study population between November and December 2023.

Study area and population

This study was conducted in Uasin Gishu County, situated in Kenya's former Rift Valley province. The county comprises six sub-counties: Turbo, Kapseret, Kesses, Soy, Ainabkoi, and Moiben. Uasin Gishu has HIV prevalence of 5.5%[11] with a total of 32,503 active clients on Anti-Retroviral Therapy (ART), of whom 61.9 % are women, and 1484 of these women were AGYW.

This study was conducted in 6 high-volume HIV treatment sites, namely: Burnt Forest Hospital, Uasin Gishu District Hospital, Moi's Bridge Health Centre, Pioneer Health Centre, Turbo and Kesses Sub-County Hospitals. These sites were selected based on the availability and continuity of cervical cancer screening workforce, devices, and the higher workload at the sites.

Inclusion and exclusion criteria

Adolescent girls and young women aged 15–24 years who were enrolled in HIV care, possessed a valid Comprehensive Care Clinic (CCC) unique identifier, were receiving antiretroviral therapy services within the county, and were able to provide informed consent or assent were included in the study. Individuals

who were HIV-positive but not yet enrolled in care those still undergoing linkage follow-up, those unable to provide consent or assent, and those with known cognitive impairments as documented by the health facility were excluded from the study.

Sample size determination

The Cochran formula was used to calculate the sample size based on the attributes of the study population [16]: n = (Z^2pq)/d^2

Where *n* was the minimum sample size, *N* the population who were attending clinic in the selected sites (449), Z = z value 1.96 at 5% type 1 error at 95% confidence level, p = prevalence of (estimated at 23% [15] P = (1 – p), d = margin of error taken as 0.05.

n = ((1.96^2) * 0.23 * 0.77)/ (0.05^2)

n = 272.14

Since N (449) is less than 10,000, the reduction formula is applied.

n = n/ (1 + (n – 1)/N)

n = 272.14/ (1 + (272.14 – 1)/449)

n = 173.4

Adjusting to design effect 1.1= 173.4*1.1

n =190.3 and a 5% non-response

n =196

Sampling technique and mechanism

With a sample size of 196, a proportionate formula ensured equal representation. This was due to the difference in volume of the target population per facility, which was mainly affected by attrition.

To identify participants, clinic booking for each day was obtained beforehand in all the study sites. The first AGYW to attend the clinic during the start of data collection for each site was selected; thereafter, every third eligible AGYW was approached to join as a study respondent [17]. This was done until the desired sample size was accrued. Table 1.

Data tools and data collection procedures

A pretested electronic-based structured questionnaire guided by the study objectives was used to collect data between November and December 2023 [18]. Six trained data collectors conducted a face-to-face interview with the respondents at their respective health facilities.

Validity. Questions were drawn from the literature, reviewed by experts on the subject area of cervical cancer screening among AGYW to ensure face and content validity.

Reliability. Test–retest reliability was assessed using a similar questionnaire administered to ten AGYW at Huruma Health Centre, with a 14-day interval between administrations. The instrument demonstrated strong reliability for knowledge of cervical cancer screening (r = 0.89) and familiarity with screening methods (r = 0.76). Table 2.

Data analysis and presentation

The R version 4.3.1 processed the data. Descriptive statistics were employed to present participant information and cervical cancer screening acceptance rates.

Table 1

Proportionate Sampling Mechanism

Proportionate sampling			
Target group	**Target population**	**Working**	**Sample Size**
Turbo Sub-County hospital	114	114/449*196	49
Pioneer Health Centre	62	62/449*196	27
Uasin Gishu District Hospital	86	86/449*196	38
Moi's Bridge Health Centre	82	82/449*196	36
Kesses Sub-County Hospital	23	23/449*196	10
Burnt Forest Hospital	82	82/449*196	36
Total	**449**		**196**

Source: [15]

A chi-square statistical analysis determined relationships between independent variables and dependent variables at a statistical significance of p-value 0.05. The statistically significant factors at p-value 0.2 were used in a multiple logistic regression model to evaluate associations and their direction and magnitude, to ensure that all the important factors were not excluded in the final model.

Ethical considerations

Ethical approval was provided by Jaramogi Oginga Odinga University of Science and Technology Ethics and Review Committee (ERC 37/04/23-5/04) and Moi Teaching and Referral Hospital/Moi University Institutional Review and Ethics Committee (FAN:0004519) and a research license from NACOSTI secured (NACOSTI/P/23/25389). Further, permission was sought from the Uasin Gishu County Director of Health Services. All adult participants signed a consent form beforehand, while adolescents between 15-17 years, a parent/legal guardian permitted verbal consent, and an assent was obtained from the adolescent. Privacy and confidentiality was maintained.

Table 2

Results of Test-Retest Reliability

Variable	Test 1 Mean (SD)	Test 2 Mean (SD)	Correlation Coefficient (r)	p-value	Interpretation
Client Knowledge of CCS	6.2 (1.1)	6.4 (1.0)	0.89	< 0.001	High reliability
Familiarity with CC screening methods	4.8 (0.9)	4.7 (0.8)	0.76	< 0.01	Good reliability

Table 3

Acceptability of Socio-Demographic Factors

Characteristic		Cervical Cancer Screening Acceptability		
	N = 168[1,2]	yes, N = 46[1,3]	no, N = 122[1,3]	p-value[4]
Screening willingness				0.9
Not willing	23 (13.7%)	6 (26.1%)	17 (73.9%)	
Willing	145 (86.3%)	40 (27.8%)	105 (72.2%)	
Age (years)				<0.001
23-24	53 (31.5%)	31 (58.5%)	22 (41.5%)	
21-22	29 (17.3%)	10 (34.5%)	19 (65.5%)	
18-20	29 (17.3%)	4 (13.8%)	25 (86.2%)	
15-17	57 (33.9%)	1 (1.8%)	56 (98.2%)	
Marital status				<0.001
Married	37 (22.0%)	24 (64.9%)	13 (35.1%)	
Single/separated	131 (78.0%)	22 (16.9%)	109 (83.1%)	
Education level				0.025
None/primary	41 (24.4%)	13 (32.5%)	28 (67.5%)	
Secondary	104 (61.9%)	22 (21.2%)	82 (78.8%)	
Tertiary	23 (13.7%)	11 (47.8%)	12 (52.2%)	
Occupation				<0.001
Unemployed	143 (85.1%)	28 (19.7%)	115 (80.3%)	
Employed	25 (14.9%)	18 (72.0%)	7 (28.0%)	
Religion				0.5
Christian	166 (98.8%)	45 (27.3%)	121 (72.7%)	
Muslim	2 (1.2%)	1 (50.0%)	1 (50.0%)	

[1] n (%) [2] Column-wise Proportion [3] Row-wise Proportion [4] Pearson's Chi-squared test; Fisher's exact test

Results

Acceptability of socio-demographic factors

A total of 168 respondents were enrolled in the study, achieving 85.7% response rate due to lost to follow-up rate of 10% and the break for the festive seasons. Out of which 33.9% (57/168) were aged between 15 and 17 years. Approximately 78% (131/168) of the respondents were single, 75.6% (127/168) attained post-primary level of education, with the majority, 85.1% (143/168), being unemployed, and 98.8% (166/168) were Christians. Out of the respondents enrolled, 27.5% (46/168) reported having at least undergone cervical cancer screening, while 86.3% (145/168) showed willingness to be screened now or in the future.

Table 4

Client-Level Factors Associated with Acceptability of Cervical Cancer Screening

Characteristic		Cervical Cancer Screening Acceptability		
	N = 168[1]	yes, N = 46[1]	no, N = 122[1]	p-value[2]
Parity				<0.001
0	100 (59.5%)	6 (6.1%)	94 (93.9%)	
1	45 (26.8%)	23 (51.1%)	22 (48.9%)	
>= 2	23 (13.7%)	17 (73.9%)	6 (26.1%)	
Age at first sex	16 (0.0, 17)	17 (15.3, 18)	15 (0.0, 17)	<0.001
History cervical cancer	123 (75.5%)	46 (37.4%)	77 (62.6%)	<0.001
Duration in HIV care				0.3
0-5_months	11 (6.5%)	2 (18.2%)	9 (81.8%)	
6-12_months	25 (14.9%)	4 (16.0%)	21 (84.0%)	
above-12_months	132 (78.6%)	40 (30.5%)	92 (69.5%)	
Undergoing cervical cancer screening is embarrassing				0.8
Screening is very embarrassing	43 (25.6%)	11 (26.2%)	32 (73.8%)	
Screening is NOT embarrassing	125 (74.4%)	35 (28.0%)	90 (72.0%)	
Undergoing cervical cancer screening is very painful				0.4
Screening is NOT painful	105 (62.5%)	31 (29.8%)	74 (70.2%)	
Screening is very painful	63 (37.5%)	15 (23.8%)	48 (76.2%)	
Cervical cancer screening means one has cancer				0.6
Disagree	135 (80.4%)	38 (28.4%)	97 (71.6%)	
Neutral	24 (14.3%)	7 (29.2%)	17 (70.8%)	
Agree	9 (5.4%)	1 (11.1%)	8 (88.9%)	
Believe one is at risk of developing cervical cancer in their lifetime				0.8
Agree	18 (10.7%)	4 (22.2%)	14 (77.8%)	
Disagree	120 (71.4%)	35 (29.4%)	85 (70.6%)	
Neutral	30 (17.9%)	7 (23.3%)	23 (76.7%)	
Distance to facility				0.14
less-than_1Km	22 (13.1%)	4 (18.2%)	18 (81.8%)	
1-5_Km	53 (31.5%)	19 (35.8%)	34 (64.2%)	
5.1-10_Km	44 (26.2%)	14 (32.6%)	30 (67.4%)	
over-10_Km	49 (29.2%)	9 (18.4%)	40 (81.6%)	
Cost to the facility				0.6
0-50_ksh	35 (20.8%)	12 (34.3%)	23 (65.7%)	
over-100_ksh	70 (41.7%)	18 (26.1%)	52 (73.9%)	
51-100_ksh	63 (37.5%)	16 (25.4%)	47 (74.6%)	
Outreach programs by facility				0.045
No	64 (38.1%)	13 (20.6%)	51 (79.4%)	
Yes	43 (25.6%)	18 (41.9%)	25 (58.1%)	
Not-sure	61 (36.3%)	15 (24.6%)	46 (75.4%)	

[1] n (%); Median (IQR)

[2] Pearson's Chi-squared test; Wilcoxon rank sum test; Fisher's exact test

Client-level factors associated with acceptability of cervical cancer screening

Cervical cancer screening (CCS) acceptability rate increased with an increase in parity, showing a significant association, P<0.001. Additionally, knowledge of cervical cancer was significantly associated with CCS, P-value < 0.001. Of the total respondents, 75.5% (123/168) were aware of cervical cancer, out of which 37.4% (46/123) had been screened for cervical cancer. It was worth noting that the median age of women enrolled in the study was 16 years at sexual debut, while the median age of those who had undergone CCS at first sex contact was 17. Additionally, the positive acceptability of CCS among women with longer duration on HIV care (above 12 months) was 30.5% (40/132), which was greater than their counterparts with lower duration on ART.

Perceived healthcare worker-related factors associated with acceptability of cervical cancer screening

Approximately 88.1% (133/168) of the respondents reported that they were confident about their healthcare provider's knowledge of CCS, of which 29.3% (39/133) of them had had cervical cancer screening. Additionally, 86.3% (145/168) of the respondents reported that the benefits and risks of cervical cancer screening were not clearly explained to them, of which 28.3% (41/145) had had cervical cancer screening. About 7.7% (13/168) of the respondents stated that their concerns about cervical cancer screening had not been adequately addressed by the healthcare provider, though only 23.1% (3/7) had had cervical cancer screening. Though none of these measured factors were statistically significantly associated with CCS acceptability.

Perceived service delivery-related factors associated with acceptability of cervical cancer screening

It was worth noting that 53.6% (90/168) of the respondents were familiar with cervical cancer screening approaches. Out of those who were familiar, 43.3% (39/90) reported having had cervical cancer screening. Familiarity with cervical cancer screening approaches was significant at p < 0.001.

Table 5

Perceived Healthcare Worker-Related Factors Associated with Acceptability of Cervical Cancer Screening

Characteristic		Cervical Cancer Screening Acceptability		
	N = 168[1,2]	yes, N = 46[1,3]	no, N = 122[1,3]	p-value[4]
Confident about healthcare provider knowledge	133 (88.1%)	39 (29.3%)	94 (70.7%)	0.8
Benefits & risks of Cervical Screen clearly explained	145 (86.3%)	41 (28.3%)	104 (71.7%)	0.6
Concerns about screening are not adequately addressed	13 (7.7%)	3 (23.1%)	10 (76.9%)	>0.9

[1] n (%) [2] Column-wise Proportion [3] Row-wise Proportion [4] Fisher's exact test; Pearson's Chi-squared test

Table 6

Perceived Service Delivery-Related Factors Associated with Acceptability of Cervical Cancer Screening

Characteristic		Cervical cancer screening acceptability		
	N = 168[1,2]	yes, N = 46[1,3]	no, N = 122[1,3]	P-value[4]
Familiarity with cervical cancer approaches				<0.001
Not familiar	78 (46.4%)	7 (9.1%)	71 (90.9%)	
Yes familiar	90 (53.6%)	39 (43.3%)	51 (56.7%)	
Sex of preferred health care worker				0.039
Either	54 (32.1%)	19 (35.2%)	35 (64.8%)	
Female	89 (53.0%)	17 (19.3%)	71 (80.7%)	
Male	25 (14.9%)	10 (40.0%)	15 (60.0%)	

[1] n (%) [2] Column-wise Proportion [3] Row-wise Proportion [4] Pearson's Chi-squared tests

Sex of the preferred healthcare worker was statistically significantly associated with CCS acceptability based on a Pearson's Chi-square test. This was clearly shown by 40% (10/25) of those who preferred male screeners had undergone CCS. Table 5

Multivariable predictors of cervical cancer screening acceptability

AGYW who were familiar with screening approaches had 4.71 times higher odds of screening as compared to those who were not familiar (AOR=4.71, 95% CI [1.71, 14.6], P=0.004). Additionally, AGWY who were employed had occupations that were 7.54 times more likely to be screened (AOR = 7.45, 95% CI [2.47, 24.9], P< 0.001). The effect of marital status (married) was a predictor. This implied that AGYW who were married were at 6.28 times higher odds of receiving cervical cancer screening as compared to their counterparts (AOR=6.28, 95% CI [2.47, 24.9], P=<0.001). Outreach was a predictor for acceptability, where outreach programs conducted had 3.21 times higher odds compared to areas not conducted (AOR = 3.21, 95% CI [1.28, 8.55], P = 0.015). The results show that AGYW who were willing to be screened preferred any gender had 3.54 times higher odds of undergoing cervical cancer screening (AOR=3.54, 95% CI [1.31, 10.2], P=0.015) as compared to those who preferred male providers. Table 6.

Discussion

The findings revealed that only 27.8% of the respondents had been screened, significantly lower than the national target of 90% for WLHIV [19]. This was consistent with findings from NorthWest Ethiopia, which reported a screening rate of 23.5%[20]. Similarly, a systematic review and a meta-analysis conducted in Ethiopia and Zimbabwe reported a screening rate of 18.17% and 17.65%, respectively [21, 22]. These consistently low figures highlight a substantial gap in screening uptake among AGYW-LHIV, potentially due to weak health systems, limited integration of cervical cancer screening into routine HIV care, and restricted availability or acceptability of screening methods.

Table 7:
Multivariable Predictors of Cervical Cancer Screening Acceptability

Characteristic	Crude Analysis			Adjusted Analysis		
	OR[1]	95% CI[1]	P-value	OR[1]	95% CI[1]	P-value
Familiarity with cervical cancer approaches						
Not familiar	Ref	Ref		Ref	Ref	
Yes familiar	7.76	3.39, 20.2	<0.001	4.71	1.71, 14.6	0.004
Outreach programs by facility						
No	Ref	Ref		Ref	Ref	
Yes	2.91	1.46, 5.93	0.003	3.21	1.28, 8.55	0.015
Occupation						
Unemployed	Ref	Ref		Ref	Ref	
Employed	10.6	4.18, 29.5	<0.001	7.45	2.47, 24.9	<0.001
Marital status						
Single separated	Ref	Ref		Ref	Ref	
Married	9.15	4.12, 21.2	<0.001	6.28	2.43, 17.2	<0.001
Sex of preferred health care worker						
Female	Ref	Ref		Ref	Ref	
Male	2.82	1.07, 7.38	0.034	1.26	0.35, 4.48	0.7
Either	2.3	1.07, 5.01	0.034	3.54	1.31, 10.2	0.015

[1] OR = Odds Ratio, CI = Confidence Interval

However, contrasting evidence from Tharaka Nithi, Kenya, revealed a 79% cervical cancer screening rate [23], suggesting that local context, program implementation, and service delivery models may significantly influence screening acceptability.

Regarding willingness to screen, the study revealed that 86.3% of the respondents were willing to undergo cervical cancer screening now or in the future. A comparable investigation performed in Ghana revealed a willingness of 82% [24]. On the other hand, this was higher than the results from a study in Ethiopia and the Kilimanjaro region that had 58.3% and 66%, respectively [25, 26]. This implied that an overwhelming number of AGYW were willing to be screened. These results suggest a generally high level of acceptability among the study population, potentially attributable to ongoing demand creation efforts, peer-to-peer support mechanisms, and enhanced health education provided during routine HIV care visits.

Familiarity with screening approaches was significantly associated with acceptability of CCS, in that participants who were familiar with screening methods were 4.71 times more likely to undergo CCS as compared to their counterparts. Some of the probable reasons for high familiarity with VIA/VILI are that it was the method offered in most health facilities, it was offered for free, and it might have been mentioned frequently during health talks. Additionally, through its availability in all sites, experience sharing among peers might have led to the high familiarity. Conversely to this, studies conducted in North Carolina, US and Canada revealed that most clients preferred HPV self-sampling [27] [28]. This could be associated with geographical disparities and technological advancements as compared to countries in Sub-Saharan Africa.

The research suggests an association between marital status and cervical cancer screening acceptability. In this study, married AGYW 64.9% had a higher rate of CCS and were 6.28 times more likely to be screened as compared to the single or separated. This was in alignment with the view of [17] in a similar study carried out in Nandi County that reported 43.3% of those who had undergone screening were married. One factor might be that married women believed they were more likely to develop CC. Consequently, the requirement for screening or partner involvement may have led to higher acceptability due to a strong support system. This suggested the necessity for screening and support from the spouse. In contrast to these findings, [29] revealed that women who were single, divorced or married were 3 times more likely to undergo CCS.

Sex of the preferred healthcare provider was significantly associated with cervical cancer screening acceptability. Respondents who expressed no gender preference or preferred female providers had 3.54 times the likelihood of being screened compared to those who preferred male providers, who had odds of 1.26. To contextualise, this might have been due to cultural discomfort and social norms barriers, as it was identified that the cultural practices surrounding the community in the study area raised girls and young women to be socially conservative and encouraged modesty. This finding is consistent with a study conducted in Kitengela, Kenya, where 39.7% of participants preferred a female healthcare provider for cervical cancer screening [30] and with studies among immigrant women in Canada, who also showed a strong preference for female physicians[31].

Study limitation

This study did not investigate reasons for the acceptability of CCS among AGYW from the healthcare workers' perspective, which calls for further investigation in this regard. Additionally, self-reporting by the participants could have subjected the study to self-desirability bias. Lastly, this study was a cross-sectional study, therefore, the true causal relationship for the low screening could not be established.

Conclusion

The willingness to screen was high, but the actual screening uptake remained low. Additionally, the respondents' had moderate cervical cancer screening knowledge and a high level of trust in healthcare workers' knowledge, but acceptability of the service remained low. Lastly, the acceptability levels depended heavily on both socio-demographic characteristics, including age, marital status, and occupation, as well as health system factors that focused on outreach programs and healthcare provider behaviour.

Recommendations

Service providers should profile AGYW attending care based on education level, marital status, and willingness to screen, to design targeted, context-specific interventions. Secondly, there is a need to enhance client health literacy and ensure the appropriate use of screening equipment, such as correctly sized speculums. Lastly, the County Health Management Team should strengthen continuous community-based and outreach screening efforts.

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Author's contribution

- Conceptualisation: Annet Oyoyo, Shehu Awandu, Dickens Omondi and Dan Onguru
- Data curation: Annet Oyoyo and Shehu Awandu
- Formal Analysis: Annet Oyoyo and Shehu Awandu
- Funding acquisition: Annet Oyoyo
- Validation and supervision: Annet Oyoyo, Dan Onguru
- Report Writing: Annet Oyoyo, Shehu Awandu, Dickens Omondi and Dan Onguru

Conflict of interest statement. None

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Data Availability statement. All datasets analysed during the current study are available and can be shared upon request due to ethical issues surrounding data protection.

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