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ASSOCIATION BETWEEN SOCIO- DEMOGRAPHIC CHARACTERISTICS AND UTILIZATION OF CERVICAL CANCER SCREENING SERVICES AMONG WOMEN OF REPRODUCTIVE AGE IN NAKURU WEST SUB COUNTY HEALTH FACILITIES

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ABSTRACT

Cervical cancer remains one of the leading causes of cancer-related illness and death among women, particularly in low- and middle-income countries. In Kenya, cervical cancer is a major public health concern, with many women diagnosed at advanced stages despite the availability of screening services. This study examined the association between socio-demographic characteristics and utilization of cervical cancer screening services among women of reproductive age attending level two and three public health facilities in Nakuru West Sub-County. A cross-sectional descriptive design was used, and systematic random sampling was applied to select 167 eligible women. Data were collected using a structured questionnaire and analyzed using SPSS version 26.0. Descriptive statistics summarized respondents' characteristics, while inferential statistics assessed associations between socio-demographic variables and screening utilization. The findings showed a statistically significant moderate association between socio-demographic characteristics and utilization of cervical cancer screening services ($\Phi = 0.278$, $p = 0.002$). Age, number of children, and health insurance status were the most influential factors. The study recommends integrating cervical cancer screening into reproductive health services, strengthening health education, improving affordability through insurance coverage, ensuring essential screening supplies, and enhancing community outreach through community health promoters, religious leaders, and male partner involvement.

Keywords: Cervical Cancer Screening, Screening Utilization, Socio-Demographic Characteristics, Health Insurance.

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INTRODUCTION

Cervical cancer is one of the most common types of cancer in women and remains a major cause of cancer-related fatalities, especially in developing nations. In 2022, around 660,000 new cases of cervical cancer were identified worldwide, leading to more than 350,000 women's deaths from the illness, up from 604,000 new cases and 340,000 deaths in 2020 (WHO). The World Health Organization emphasized the seriousness of the disease in 2018 by stating that "every two minutes, a woman dies from cervical cancer" (WHO, 2018). Cervical cancer is known to be the third most prevalent type of cancer in women globally, and it ranks as the leading cancer among women in 42 low-income countries. Research indicates that rates of occurrence vary widely, reaching 75 cases per 100,000 women in high-risk nations, while rates are below 10 per 100,000 women in low-risk countries. Nearly 60% of the 311,000 recorded global deaths in 2018 occurred in low- and middle-income countries, more than twice the proportion recorded in many high-income countries (Arbyn et al., 2020).

Cervical cancer screening is a highly effective preventive strategy because it enables early detection and treatment of precancerous lesions. Screening methods such as Pap smear, visual inspection with acetic acid (VIA), and HPV DNA testing have significantly reduced cervical cancer incidence and mortality in high-income countries (Arbyn et al., 2020). Organized screening programs in these settings have achieved high coverage rates, often exceeding 70%, resulting in substantial declines in disease burden. However, global disparities in screening utilization persist. While high-income countries have well-established, population-based screening programs, most low- and middle-income countries rely on opportunistic screening, leading to low coverage (WHO, 2020). To address this, WHO launched the global strategy for cervical cancer elimination, targeting 90% HPV vaccination, 70% screening coverage, and 90% treatment (WHO, 2020).

Sub-Saharan Africa bears a disproportionate burden of cervical cancer, accounting for a large share of global morbidity and mortality (Sung et al., 2021). Despite the availability of effective screening methods, utilization in Africa remains low, with coverage far below the WHO target of 70% (Mengistie et al., 2025). A systematic review by Mantula et al. (2024) reported that screening uptake in sub-Saharan Africa remains below 20% in many settings. The low uptake of screening services is linked to limited knowledge, fear of diagnosis, misconceptions, stigma, gender norms, lack of decision-making autonomy, long distances to health facilities, inadequate infrastructure, shortage of trained providers, and costs associated with screening (Atnafu et al., 2024; Emagneneh et al., 2025; Mengistie et al., 2025). Women may also require spousal approval to access healthcare services, which can either facilitate or hinder screening uptake depending on partner support (Li et al., 2024).

In Kenya, cervical cancer remains a major public health concern and is among the leading causes of cancer-related deaths among women. The country reports thousands of new cases annually, with many women diagnosed at advanced stages (WHO, 2020; Sung et al., 2021). In 2020, Kenya reported 5,236 new cervical cancer cases, a 59.34% rise from 3,286 cases in 2012, accompanied by a 53.92% increase in deaths from 2,411 to 3,711 over the same period (GLOBOCAN, 2020). Despite the availability of screening services, utilization remains suboptimal, with some estimates indicating coverage below 20% (Li et al., 2024). The Kenyan government has implemented initiatives such as the National Cancer Screening Guidelines, integration of screening into primary healthcare, HPV testing, and community awareness campaigns (WHO, 2020).

In Nakuru County, cervical cancer remains a critical health challenge. In 2022, the county reported 82 new cases, the highest number recorded in Kenya that year. National cancer report data indicate cervical cancer incidence of 50% in Nakuru County compared to the national incidence of 40%, while KHIS reports from 2019 show screening coverage of 10% in Nakuru County compared to 16% nationally. In March 2025, the county government initiated a month-long campaign targeting 1 million women and girls with information on screening and vaccination, including free screening at 15 public health facilities. However, there is limited

data on cervical cancer screening utilization in Nakuru West Sub-County.

This study therefore assessed the association between socio-demographic characteristics and utilization of cervical cancer screening services among women of reproductive age attending hospitals in Nakuru West Sub-County. The socio-demographic factors examined were age, marital status, type of marriage, number of children, education level, occupation, monthly income, and health insurance status.

LITERATURE REVIEW

Theoretical Framework

This study was guided by the Health Belief Model (HBM). The model explains how an individual's health-related behaviour is influenced by perceived susceptibility, perceived severity, perceived benefits, perceived barriers, cues to action, and self-efficacy (Rosenstock, 1974; Becker, 1974). In this study, the Health Belief Model was useful in explaining how socio-demographic characteristics may influence women's utilization of cervical cancer screening services.

The model aligns with the study because socio-demographic factors such as age, marital status, type of marriage, number of children, education level, occupation, monthly income, and health insurance status can shape women's beliefs, access, awareness, and decision-making regarding cervical cancer screening. For example, education level may influence awareness of cervical cancer risks and the perceived benefits of screening, while monthly income and health insurance status may affect perceived financial barriers to accessing screening services. Similarly, marital status, type of marriage, and number of children may influence women's reproductive health priorities, partner support, and healthcare-seeking behaviour.

Therefore, the Health Belief Model provided a suitable theoretical basis for examining the association between socio-demographic characteristics and utilization of cervical cancer screening services among women of reproductive age attending hospitals in Nakuru West Sub-County. The model helped explain how differences in women's social and economic backgrounds may influence their likelihood of using cervical cancer screening services.

Empirical Review

The empirical review examined previous studies on how socio-demographic associate with the utilization of cervical cancer screening services. It focused on how age, marital status, type of marriage, number of children, education level, occupation, monthly income, and health insurance status determined screening uptake among women. Cervical cancer represents a significant global healthcare challenge, and screening stood out as an effective preventive measure. However, utilization rates of cervical cancer screening services varied widely among different populations, underscoring the impact of socio-demographic. Recent studies demonstrated that socio-demographic factors significantly influenced screening uptake. A multilevel analysis of KDHS 2022 data found that individual-level factors such as education, employment and parity, as well as community-level factors such as place of residence and geographic region, significantly influenced screening behavior. Women residing in urban areas and those with higher socioeconomic status were more likely to access screening services compared to those in rural and low-income settings (Tilahun et al., 2025). Similarly, women aged 40–49 years were more likely to undergo screening compared to younger women, while older women, particularly those aged 30–49 years, were significantly more likely to have been screened, indicating increased risk perception with age (Moucheraud et al., 2025). Higher levels of education, health insurance coverage and improved socioeconomic status were strongly associated with increased screening utilization (Ba et al., 2021). Formal education and employment status positively influenced screening uptake because educated women were more likely to access health information and services, while women working in formal sectors had financial stability and exposure to health promotion messages (Emagneneh et al., 2025). Conversely, low income and poor socioeconomic status hindered access to screening by limiting women's ability to afford screening tests,

transportation costs and time off from work (Hawkins et al., 2018).

Marital status also influenced utilization of cervical cancer screening services. Studies in sub-Saharan Africa indicated that married women were generally more likely to utilize screening services because of increased contact with healthcare systems during antenatal care, family planning and other reproductive health services (Belay et al., 2020; Atnafu et al., 2024). Married women may also have perceived themselves to be at higher risk due to sexual activity. However, findings were not entirely consistent, since marital status was not always statistically significant after controlling for age, education and knowledge (Tilahun et al., 2025). This suggested that marital status may be mediated by socio-economic and behavioral variables. From a socio-cultural perspective, marital status also interacted with gender norms and decision-making autonomy, since some married women required partner approval to access healthcare services, while unmarried women could face stigma linked to reproductive health services (Atnafu et al., 2024).

Based on the theoretical and empirical review, Figure 1 was developed showing how the independent and dependent variables relate to each other in a schematic way.

Figure 1 shows the study's conceptual framework based on the empirical and theoretical framework.

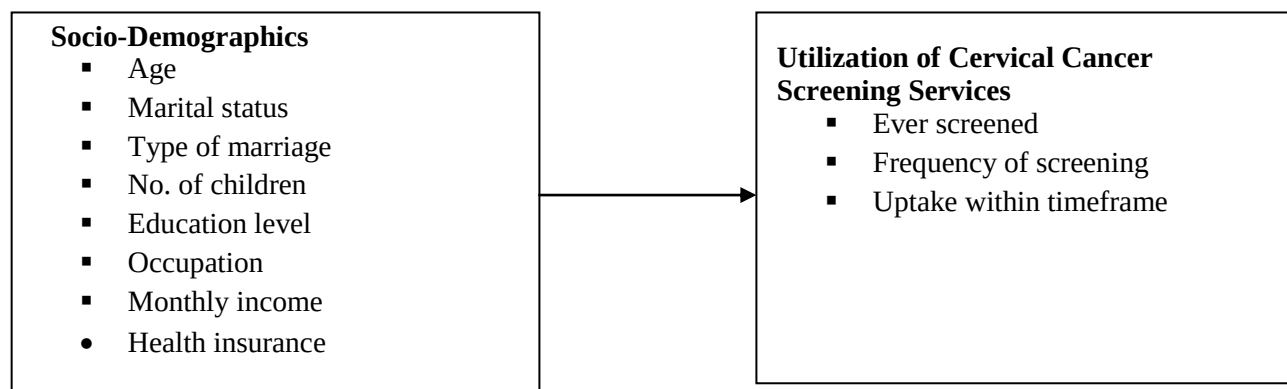


Figure 1 Conceptual Framework

METHODOLOGY

This study adopted an analytical cross-sectional study design. The analytical approach was considered appropriate because the study not only sought to determine the association between demographic characteristics and utilization of cervical cancer screening services. The target population comprised women aged 18–49 years attending maternal, child health and family planning clinics at Kapkures Health Centre, Nakuru West Health Centre, Rhonda Health Centre, and Forest Dispensary during data collection. The sample size was determined using Fisher's formula, giving 167 respondents, proportionately allocated across the four facilities and selected through systematic random sampling. A questionnaire with a structured format was created to gather self-reported information from the participants. All those who qualified for participation were briefed about the research and its objectives. Both spoken and written approval was gathered from individuals involved in the study. Anonymity for participants was safeguarded by using distinct numbers on the questionnaire. The analysis of data was conducted with SPSS software. To summarize the information, descriptive statistics such as mean, frequency, percent, and standard divergence was utilized based on the participants' responses. To forecast the relationships between independent and dependent variables, inferential statistics was applied. Permission and approval to carry out the study were sought-after from the KEMU SERC and NACOSTI. Similarly, permission was sought from county department of health research and the sub county health management team to access the selected facilities and the officer in charge of the facilities to access the participants.

FINDINGS

The findings are based on the facts gathered by means of structured questionnaires that were given to 164 women aged 18–49 years who visited maternal and child health (MCH) and family planning (FP) clinics at Kapkures Health Centre, Nakuru West Health Centre, Rhonda Health Centre, and Forest Dispensary.

The study examined the association between the socio- demographic characteristics and utilization of cervical cancer screening services among women of reproductive age in attending Nakuru West Sub County hospitals. The demographic variables that were assessed were age, marital status, age of marriage, type of marriage, number of children, education level, occupation, monthly income, and health insurance. Figure 2 show the findings obtained.

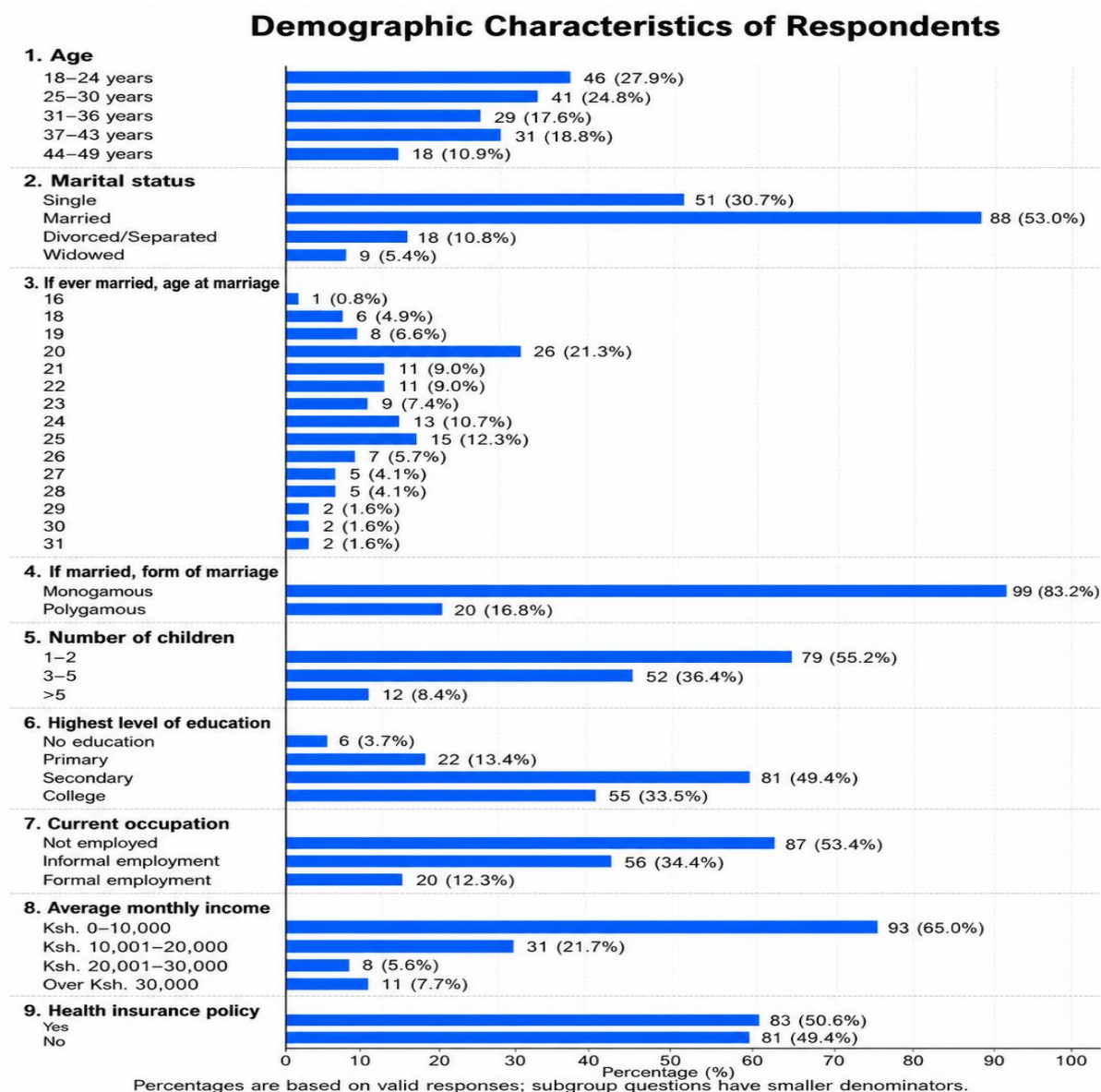


Figure 2: Demographic Characteristics

The results indicate that the largest proportion of respondents were aged 18–24 years (27.9%), followed by those aged 25–30 years (24.8%), while women aged 44–49 years (10.9%) formed the smallest group. This suggests that most respondents were young to middle-aged women, a key target group for cervical cancer prevention interventions.

Regarding marital status, more than half of the respondents were married (53.0%), while 30.7% were

single, and a smaller proportion were divorced/separated (10.8%) or widowed (5.4%). Among those who had ever been married, most entered marriage between the ages of 20 and 25 years, indicating early exposure to reproductive health risks associated with cervical cancer.

In terms of marriage structure, the majority of married respondents were in monogamous unions (83.2%), while 16.8% reported being in polygamous marriages. Over half of the respondents (55.2%) had one to two children, while 36.4% had three to five children, suggesting relatively moderate parity among the study population.

With respect to education, nearly half of the respondents (49.4%) had attained secondary education, and 33.5% had tertiary-level education, while only 3.7% reported having no formal education. This indicates a generally moderate to high level of educational attainment, which may positively influence health-seeking behavior and awareness of preventive health services. Regarding economic characteristics, more than half of the respondents (53.4%) were not employed, while 34.4% were engaged in informal employment and only 12.3% had formal employment.

A majority of the respondents (65.0%) reported a monthly income of Ksh. 0–10,000, reflecting low-income levels among the study population. Income limitations may affect access to healthcare services, including preventive screening. Concerning health insurance coverage, 50.6% of the respondents reported having a health insurance policy, while 49.4% did not. This near-equal distribution highlights potential disparities in financial access to cervical cancer screening services and underscores the importance of affordable and accessible screening programs within public health facilities.

Pearson's correlation analysis was conducted to determine the strength and direction of relationships between socio-demographic variables and indicators of screening utilization, including whether respondents had ever undergone cervical cancer screening, the number of times screened, and perceptions regarding screening frequency. In addition, symmetric measures (Phi and Cramer's V) were used to assess the strength of association between categorical variables and screening utilization.

Table 1: Correlation Between Socio-Demographic Characteristics and Utilization of Cervical Cancer Screening Indicators

Socio-demographic variable	Ever screened: r / p-value	Number of times screened: r / p-value	Perceived screening frequency: r / p-value
Age	-.251, p = .001	.353, p = .007	-.099, p = .209
Marital status	-.141, p = .072	.118, p = .379	-.064, p = .416
Type of marriage	.018, p = .843	.066, p = .651	.051, p = .581
No. of children	-.050, p = .558	.328, p = .014	-.156, p = .063
Education level	-.076, p = .335	.036, p = .790	-.016, p = .837
Occupation	-.132, p = .093	.155, p = .250	-.124, p = .117
Monthly income	-.120, p = .154	.048, p = .733	-.174, p = .039
Health insurance	.244, p = .002	-.258, p = .053	.104, p = .185

Table 1 provides results that indicate different levels of correlation between the socio-demographic factors and use of screening services on cervical cancer.

The study established that socio-demographic factors collectively had a statistically significant relationship with cervical cancer screening utilization (Phi = 0.278, p = 0.002), indicating a moderate association. This finding supports broader African evidence by Mengistie et al. (2025) and Ba et al. (2021), who reported that socio-demographic characteristics significantly influence screening behavior.

Age showed statistically significant negative correlation with having undergone cervical cancer screening ever (r = 0.251, p = 0.001) and the results indicated that younger women had a higher probability of being

screened than older women. On the other hand, age had a positive and significant correlation with the frequency of being screened ($r = 0.353$, $p = 0.007$), implying that elderly women that had used screening services were more disposed to have been screened repeatedly. This partially agrees with Ba et al. (2021), who found that older women are more likely to utilize screening services. However, this study extends existing literature by demonstrating a life-course pattern, where younger women initiate screening and older women maintain it, an insight not strongly emphasized in previous studies.

The higher screening uptake among younger women may be linked to frequent contact with reproductive health services such as MCH and family planning clinics, which increases exposure to screening opportunities. The observation can be explained by the fact that younger women have more contact with reproductive health facilities including MCH and FP clinics.

Every condition was not statistically significant as the status of marriage and cervical cancer screening ($p = 0.072$), but was significantly related to age and parity. In the same way, marriage type did not show a significant correlation with the use of screening ($p > 0.05$). Similarly, the non-significance of marital status deviates from some studies that associate marital support with increased utilization, suggesting that in the study setting, structural and psychological factors may outweigh marital influence. In contrast, marital status was not statistically significant ($p = 0.072$), which contradicts findings by Belay et al. (2020) and Atnafu et al. (2024), who reported higher uptake among married women due to partner support and increased interaction with reproductive health services. The current findings instead support Tilahun et al. (2025), who argued that marital status is not an independent determinant but is mediated by other variables such as knowledge and access. This suggests that in Nakuru West, structural and behavioral factors may outweigh marital influence. The number of children was not significantly correlated with the ever screened ($p = 0.558$), but had positive correlation with the number of times ever screened ($r = 0.328$, $p = 0.014$). This implies that the women that have higher parity can be exposed to more healthcare services through their antenatal and postnatal visits, hence more chances of screening.

Direct correlation with ever having undergone screening did not significantly work between education level ($p = 0.335$). Similarly, education level was not statistically significant ($p = 0.335$), contrasting with Arbyn et al. (2020) and Emagneneh et al. (2025), who identified education as a strong predictor of screening uptake.

Nevertheless, education was closely linked to income and occupation, which implies that this factor indirectly affects the use of screening based on the socio-economic level. Therefore, this study suggests that education operates indirectly through knowledge and economic empowerment, thus refining existing evidence. However, the study provides a more subtle interpretation by suggesting that education operates indirectly through knowledge acquisition and socioeconomic empowerment, rather than as an independent predictor. This finding contributes to the literature by highlighting the mediating role of knowledge and access.

Notably, health insurance status demonstrated statistically significant positive relationship with either ever conducted cervical cancer screening ($r = 0.244$, $p = 0.002$). This shows that insured women had higher chances to use screening services than noninsured women. The positive association between financial capacity (insurance coverage) and screening uptake strongly supports findings by Hawkins et al. (2018) who demonstrated that women with financial access are more likely to utilize preventive health services. This underscores the importance of financial protection mechanisms in improving service utilization.

Table 2: Symmetric Measures Showing Association Between Socio-Demographic Characteristics and Utilization of Cervical Cancer Screening Services

		Value	Approximate Significance
Nominal by Nominal	Phi	.278	.002
	Cramer's V	.278	.002
N of Valid Cases		163	

Table 2 shows the symmetric measures that determine the strength of association between the socio-demographic factors and the use of cervical cancer screening services. The outcome shows a Phi of 0.278 and Cramer V of 0.278 that was statistically significant ($p = 0.002$). These values indicate a moderate relationship between the socio-demographic variables used and the screening use.

The statistically significant symmetric measures reveal that combination of socio-demographic factors is affecting the use of cervical cancer screening services among women of reproductive age in Nakuru West Sub County. Though there was no evidence of strong association with individual variables like marital status and education, when they are combined, they also add up to significantly influence screening behavior.

CONCLUSIONS

The study concludes that socio-demographic characteristics are important determinants of cervical cancer screening utilization among women of reproductive age attending hospitals in Nakuru West Sub-County. Age, number of children, and health insurance status showed the strongest influence on screening behavior. Younger women were more likely to have ever been screened, while older women and women with more children were more likely to report repeated screening, probably due to continued contact with reproductive health services. Health insurance also increased the likelihood of screening by reducing financial barriers. Although education level, marital status, occupation, monthly income, and type of marriage were not independently significant in all measures, they may still influence screening indirectly through awareness, decision-making power, and access to care. Therefore, cervical cancer screening programs should prioritize affordable services, insurance coverage, health education, and targeted outreach to underserved demographic groups.

RECOMMENDATIONS

Recommendations for Policy and County Government

- The Nakuru County Department of Health should strengthen integration of cervical cancer screening into routine reproductive health services including family planning, antenatal care, postnatal care, and HIV clinics.
- County leadership should prioritize outreach programs to underserved and low-income populations to reduce inequities in access.
- Policies should emphasize quality assurance and client-centered care in cervical cancer screening services.
- The policymakers ought to encourage the coverage of health insurance to more women in the reproductive age since insured women will have higher chances of accessing the cervical cancer screening services.

Recommendations for Health Facilities

- Health facilities should ensure privacy, confidentiality, and respectful communication during screening.

- Providers should receive regular training and mentorship on pain-reduction techniques and effective counseling.
- Facilities should establish functional screening registers and follow-up systems, including SMS or phone reminders.
- Adequate supplies and equipment for screening should be consistently available.

Recommendations for Community-Level Interventions

- Community Health Promoters (CHPs) should conduct targeted sensitization addressing myths, stigma, and fear related to screening.
- Male partners, religious leaders, and community gatekeepers should be engaged to support women's decision-making.
- Community dialogues should normalize cervical cancer screening as routine preventive care.

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