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LEVEL OF KNOWLEDGE ON CERVICAL CANCER AND SCREENING AMONG WOMEN IN NANDI COUNTY, KENYA

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Abstract

Knowledge and awareness of cervical cancer are essential for effective prevention, early detection, and reduction of disease burden among women. Despite the availability of screening services, cervical cancer continues to pose a significant public health challenge, especially in low- and middle-income countries. This study aimed to assess the level of knowledge regarding cervical cancer and screening among women of reproductive age in Nandi County, Kenya. A facility-based descriptive correlational study was conducted among 341 women attending maternal and reproductive health services at Kapsabet Referral Hospital. Data were collected using structured questionnaires and analyzed using SPSS version 23. Knowledge was evaluated based on awareness, risk factors, symptoms, and screening practices and categorized as good (80–100%), fair (50–79%), and poor (<50%). The findings indicated that 83.8% of the respondents had heard about cervical cancer. However, only 20% demonstrated good knowledge, while 55% had fair knowledge and 25% had poor knowledge. Knowledge related to Human Papillomavirus (HPV) infection and cervical cancer symptoms was notably inadequate. The study concludes that although awareness levels are relatively high, comprehensive knowledge about cervical cancer remains insufficient among women of reproductive age in Nandi County. Strengthening health education programs focusing on HPV infection, symptoms, risk factors, and screening practices is recommended to improve prevention and early diagnosis of cervical cancer.

Key Words: cervical cancer, knowledge, screening, HPV, Kenya, women.

Introduction

Cervical cancer is a major global health problem affecting women, particularly in low- and middle-income countries where access to preventive and screening services is limited. The disease is mainly associated with persistent infection by the Human Papillomavirus (HPV), which has been identified as the primary cause of cervical cancer development (Zhang et al., 2022). Although effective preventive measures such as HPV vaccination and routine cervical cancer screening are available, the burden of the disease continues to rise in many developing nations, especially within sub-Saharan Africa.

Worldwide, cervical cancer remains one of the leading causes of cancer-related morbidity and mortality among women. The burden is disproportionately higher in developing countries due to inadequate healthcare infrastructure, limited awareness, poverty, and low utilization of screening services. Evidence indicates that many women globally have never undergone cervical cancer screening, particularly those living in resource-limited settings where healthcare access and public health education programs are insufficient (Bruni et al., 2022). In sub-Saharan Africa, cervical cancer screening uptake remains extremely low, with only a small percentage of eligible women accessing available screening services. Consequently, many cases are diagnosed at advanced stages, resulting in poor prognosis, increased complications, and high mortality rates.

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In Kenya, cervical cancer is the second most common cancer among women and a leading cause of cancer-related deaths (Ng'ang'a et al., 2018). Despite the availability of screening services, the uptake remains low, with only a small percentage of women participating in regular screening programs (Aduda et al., 2020). This situation highlights a significant gap between the availability of preventive services and their utilization. One of the key contributing factors to this gap is inadequate knowledge about cervical cancer and its prevention.

Knowledge plays a critical role in influencing health-seeking behavior and preventive practices. Women who are knowledgeable about cervical cancer, its risk factors, symptoms, and screening methods are more likely to engage in early detection practices (Nyambe et al., 2019). However, evidence suggests that while general awareness of cervical cancer may be relatively high, detailed knowledge remains limited. For instance, many women are aware of the existence of cervical cancer but lack understanding of its causes, particularly the role of HPV infection, as well as other risk factors such as multiple sexual partners and early sexual activity (Basu et al., 2019; Heena et al., 2019).

Furthermore, knowledge of the signs and symptoms of cervical cancer is often inadequate among women. Early stages of cervical cancer are usually asymptomatic, making it essential for women to recognize warning signs such as persistent pelvic pain and abnormal bleeding (Mengesha et al., 2020). However, studies have reported that a significant proportion of women are unable to identify these symptoms, which delays diagnosis and treatment. In addition, misconceptions regarding the causes and transmission of cervical cancer continue to persist, with some women attributing the disease to non-medical factors such as fate, witchcraft, or poor hygiene practices (Ozoemena & Okoronkwo, 2019).

Knowledge of cervical cancer screening is another critical component of prevention. Screening methods such as Pap smear, Visual Inspection with Acetic Acid (VIA), and Visual Inspection with Lugol's Iodine (VILI) are effective in detecting precancerous lesions and preventing disease progression. However, awareness of these methods remains suboptimal. Studies have shown that although some women are aware that screening exists, they lack knowledge of the appropriate age to begin screening and the recommended screening intervals (Kinyua et al., 2019). This incomplete knowledge limits the effectiveness of screening programs and contributes to low uptake.

In developing countries, including Kenya, several studies have consistently reported that knowledge of cervical cancer is moderate but insufficient for promoting preventive behavior (Getachew et al., 2019; Ngune et al., 2020). These findings suggest that existing awareness campaigns may not be adequately addressing the depth and accuracy of information required to influence behavior change. Additionally, disparities in knowledge exist between rural and urban populations, with women in rural areas often having less access to health information and services. Given the importance of knowledge in shaping health behaviors, it is essential to assess the level of knowledge among women of reproductive age, particularly in resource-limited settings. Understanding the extent of awareness, knowledge of risk factors, symptoms, and screening practices can help identify gaps that need to be addressed through targeted interventions. This is particularly relevant in Nandi County, where cervical cancer screening uptake remains low despite the availability of healthcare services.

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Therefore, this study aims to assess the level of knowledge on cervical cancer and screening among women of reproductive age in Nandi County, Kenya. Specifically, the study focuses on evaluating awareness, knowledge of risk factors such as HPV infection and multiple sexual partners, recognition of symptoms, and understanding of screening methods and guidelines. By providing a comprehensive assessment of knowledge, this study contributes to the development of effective health education strategies aimed at improving cervical cancer prevention and control.

Materials & Methods

Study Design

This study employed a descriptive correlational research design using a quantitative approach to assess the level of knowledge on cervical cancer and screening among women of reproductive age. The descriptive component enabled the researcher to systematically describe the level of awareness, understanding of risk factors, symptoms, and screening knowledge, while the correlational aspect provided a framework for examining relationships between knowledge and other study variables within the broader research. For the purpose of this article, a subset analysis focusing exclusively on knowledge variables was conducted.

Study Setting

The study was conducted at Kapsabet Referral Hospital**,** a major public healthcare facility in Nandi County, Kenya. The hospital offers a wide range of maternal and reproductive health services, including Family Planning (FP), Mother and Child Health (MCH) clinics, antenatal, and postnatal services. These service points provided access to women of reproductive age, making the facility an appropriate setting for assessing knowledge related to cervical cancer and screening.

Study Population

The target population comprised women aged 20–49 years attending maternal and reproductive health services at the study site. This group was selected because women within this age range are at risk of developing cervical cancer and are the primary target for screening programs.

Sample Size and Sampling Technique

A sample size of 341 respondents was determined using Cochran's formula at a 95% confidence level and a margin of error of 0.05, based on an estimated population of 3,000 women attending the facility. The sample size was adjusted using the finite population correction formula to obtain the final sample. A convenience sampling technique was used to recruit participants who were available and willing to participate during the data collection period. This approach was appropriate due to time and resource constraints and ensured access to respondents across different service units, including MCH, FP clinics, and female wards.

Data Collection Instrument

Data were collected using a structured, interviewer-administered questionnaire adapted from a previously validated tool assessing knowledge, attitudes, and practices related to cervical cancer screening. The questionnaire was modified to suit the study objectives and context.

For this article, only the knowledge-related sections of the questionnaire were analyzed, which included:

- Awareness of cervical cancer
- Knowledge of risk factors (e.g., HPV infection, multiple sexual partners)
- Knowledge of symptoms (e.g., persistent pelvic pain)
- Knowledge of screening methods and guidelines (e.g., Pap smear, screening intervals)

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Responses were measured using a five-point Likert scale ranging from strongly agree to strongly disagree.

Validity and Reliability of the Instrument

Content validity of the questionnaire was ensured through expert review by academic supervisors and members of the research committee. The tool was also adapted from an established study to enhance its validity. A pilot study was conducted among 35 women at Baraton Center to test the clarity, reliability, and applicability of the instrument. Feedback from the pilot study was used to revise ambiguous questions. Reliability of the instrument was assessed using Cronbach's alpha coefficient, which yielded a value of 0.918, indicating excellent internal consistency of the questionnaire.

Data Collection Procedure

Data collection was conducted after obtaining ethical approval and permission from the hospital administration. Participants were recruited from various service points, including MCH and FP clinics, antenatal and postnatal wards. Data were collected through face-to-face interviews, ensuring that respondents with varying literacy levels were included. For participants unable to read or write, trained research assistants administered the questionnaire and recorded responses. The questionnaires were also digitized using Google Forms to facilitate efficient data collection and minimize data entry errors.

Measurement of Knowledge Level

Knowledge was measured by assigning scores to correct responses across domains including awareness, symptoms, risk factors, and screening practices. Each correct response was awarded one point, and the total score was converted into a percentage. Based on the percentage scores, knowledge levels were categorized as good (80–100%), fair (50–79%), and poor (<50%). This approach ensured an objective and standardized assessment of respondents' knowledge.

Data Analysis

Data were entered, cleaned, and analyzed using Statistical Package for the Social Sciences (SPSS) version 23. Descriptive statistics were used to summarize knowledge-related variables, including frequencies, percentages, means, and standard deviations. The results were presented in the form of tables and charts for clarity. For this article, analysis focused specifically on knowledge variables derived.

Ethical Considerations

Ethical approval for the study was obtained from the relevant institutional review board. Permission to conduct the study was granted by the hospital administration. Informed consent was obtained from all participants prior to data collection. Participants were assured of confidentiality and anonymity, and their participation was entirely voluntary. They were informed of their right to withdraw from the study at any time without any consequences.

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Results

Overview of Respondents

A total of 341 women of reproductive age (20–49 years) participated in this study. The results presented focus specifically on knowledge of cervical cancer, including awareness, symptoms, risk factors, and screening knowledge.

Awareness of Cervical Cancer

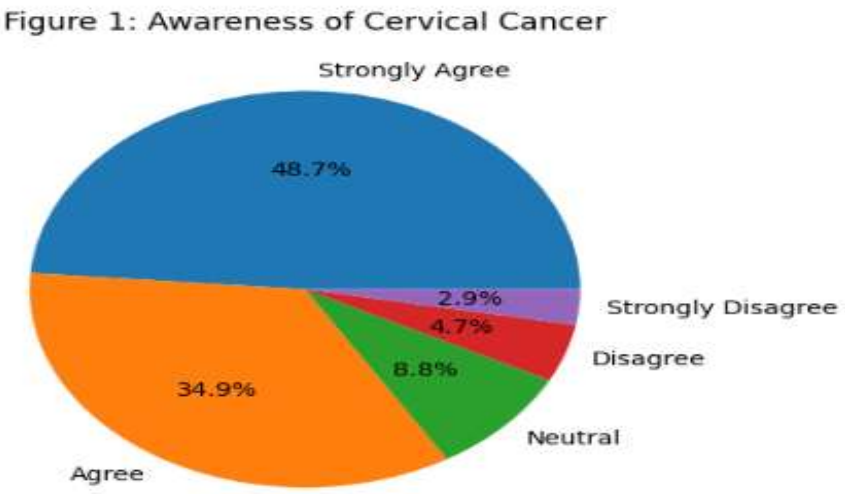
The results indicate that awareness of cervical cancer was high among respondents.

Table 1: Awareness of Cervical Cancer (n = 341)

Response Category	Frequency	Percentage (%)
Strongly Agree	166	48.8
Agree	119	35.0
Neutral	30	8.8
Disagree	16	4.7
Strongly Disagree	10	2.9
Total	**341**	**100**

Table 1 shows that 83.8% of respondents (48.8% strongly agree, 35.0% agree) had heard about cervical cancer. Only a small proportion expressed disagreement (7.6%) or uncertainty (8.8%). This indicates that general awareness is high among women in Nandi County. Public health campaigns, media exposure, and healthcare interactions may have contributed to this level of awareness. Despite high awareness, awareness alone does not reflect depth of understanding, which is evident in later results.

Figure 1: Awareness of Cervical Cancer



The pie chart visually emphasizes that the largest segments are “Strongly Agree” and “Agree”, occupying the majority of the chart. The dominance of these segments confirms that awareness is widespread and consistent across respondents. Efforts should now shift from awareness creation to knowledge improvement, as awareness has already been achieved.

Knowledge of Symptoms

Knowledge of cervical cancer symptoms was moderate and characterized by uncertainty. Only 48.7% of respondents correctly identified persistent pelvic pain as a symptom, while 32.3% were unsure. This suggests that many women lack clear understanding of early warning signs, which may delay timely diagnosis.

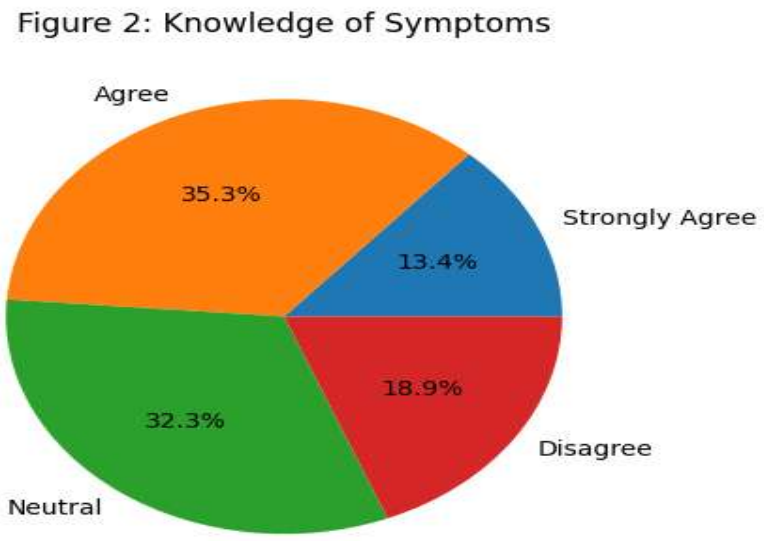
Table 2: Knowledge of Symptoms

Response	**Percentage (%)**
Strongly Agree	13.4
Agree	35.3
Neutral	32.3
Disagree	18.9

The high proportion of neutral responses indicates uncertainty among respondents. This suggests that many women lack clear knowledge of early warning signs, which may delay diagnosis.

Figure 2: Knowledge of Symptoms

A pie chart showing distribution of responses



The diagram highlights a large neutral segment, indicating gaps in knowledge.

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Knowledge of Risk Factors

Multiple Sexual Partners

As shown in Table 3a, knowledge regarding multiple sexual partners as a risk factor was moderate. Approximately 64.8% of respondents recognized multiple sexual partners as a risk factor.

Table 3a: Multiple Sexual Partners

Response	Percentage (%)
Strongly Agree	30.8
Agree	34.0
Neutral	21.9
Disagree	13.4

Although the majority recognized this risk factor, a notable proportion remained uncertain or disagreed. Knowledge is moderate but not universal. A considerable proportion (35%) either disagreed or were unsure, indicating knowledge gaps.

HPV Infection

Knowledge of Human Papillomavirus HPV infection was also moderate, with a significant proportion of neutral responses.

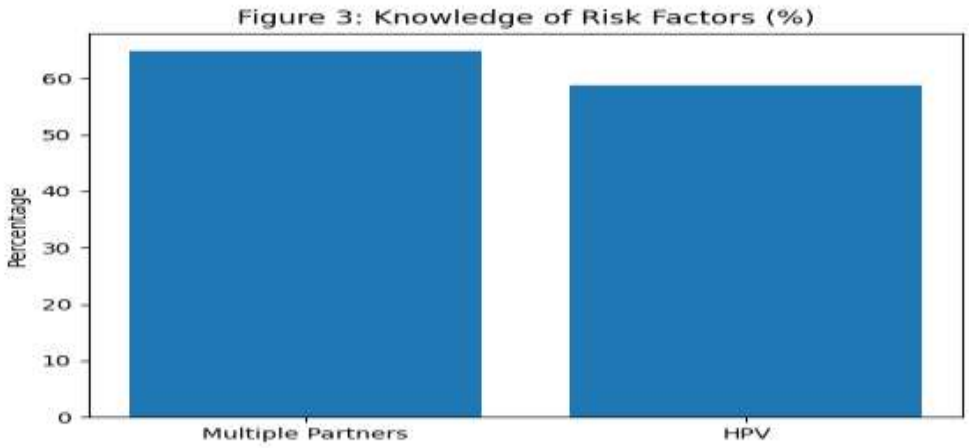
While some participants correctly identified HPV as a key risk factor for cervical cancer, lack clear understanding of its causal role in the development of cervical cancer.

Table 3b: HPV Infection

Response	Percentage (%)
Strongly Agree	24.0
Agree	34.7
Neutral	33.2
Disagree	8.0

Only 58.7% of respondents recognized Human Papillomavirus HPV as a risk factor, with 33.2% neutral. The high neutral percentage reflects limited understanding of HPV, despite it being the primary cause of cervical cancer. HPV awareness is essential for: Screening and Vaccination acceptance. This gap significantly affects prevention strategies.

Figure 3: Knowledge of Risk Factors



A bar chart comparing responses for multiple partners and HPV. The figure clearly shows that the better awareness of multiple partners and lower clarity on HPV. Respondents are more familiar with behavioral risk factors than biological causes (HPV). Health education needs to emphasize HPV awareness specifically.

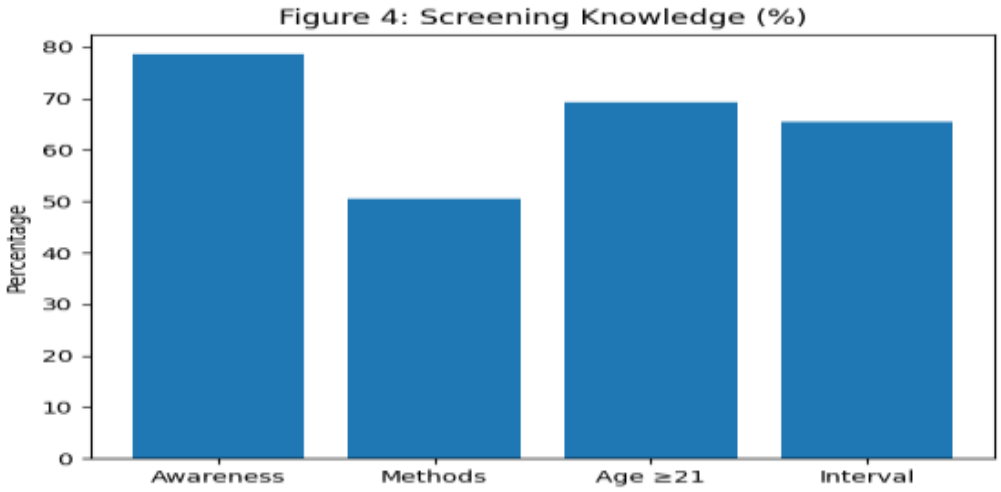
Knowledge of Cervical Cancer Screening

Table 4: Screening Knowledge

Variable	**Agree (%)**	**Mean**
Awareness of screening	78.6	1.88
Knowledge of methods	50.6	2.40
Screening age ≥21	69.3	2.06
Screening interval	65.4	2.09

Knowledge of screening was found to be moderate with significant gaps in technical understanding**.** Table 4 highlights mixed levels of knowledge regarding cervical cancer screening among respondents. While a substantial proportion of women (78.6%) demonstrated awareness of the existence of screening services, knowledge of specific screening methods was considerably lower (50.6%), and understanding of recommended screening age and intervals was only moderate, ranging between approximately 65% and 69%. These findings suggest that although respondents are generally aware of cervical cancer screening, they lack the technical knowledge necessary to effectively utilize these services. In particular, many women understand the importance of screening but do not have adequate information regarding how screening is conducted or when it should be performed. This gap between general awareness and detailed knowledge is a critical barrier and likely contributes to the low uptake of cervical cancer screening services observed in similar settings.

Figure 4: Screening Knowledge



A bar chart comparing screening variables. This pattern is further illustrated in Figure 4, where the bar chart shows a high level of awareness contrasted with noticeably lower levels of knowledge regarding screening methods and intervals. The clear decline from general awareness to specific knowledge underscores the need for educational interventions that emphasize practical information and procedural understanding of screening.

Overall Knowledge Level

Knowledge scores were categorized into three levels: good, fair, and poor. As shown in Table 5, the majority of respondents demonstrated fair knowledge, while fewer had good knowledge and a notable proportion had poor knowledge
.

Table 5: Overall Knowledge Classification

Knowledge Level	Percentage (%)
Good (80–100%)	~20
Fair (50–79%)	~55
Poor (<50%)	~25

Table 5 presents the overall classification of knowledge levels, revealing that approximately 20% of respondents had good knowledge, the majority (about 55%) demonstrated fair knowledge, and a significant proportion (around 25%) exhibited poor knowledge. This distribution indicates that most women possess only partial understanding of cervical cancer, which may not be sufficient to influence positive health-seeking behavior. The persistence of a notable proportion of respondents with poor knowledge further highlights existing gaps in health education. Figure 5 supports these findings, as the pie chart shows that the largest segment

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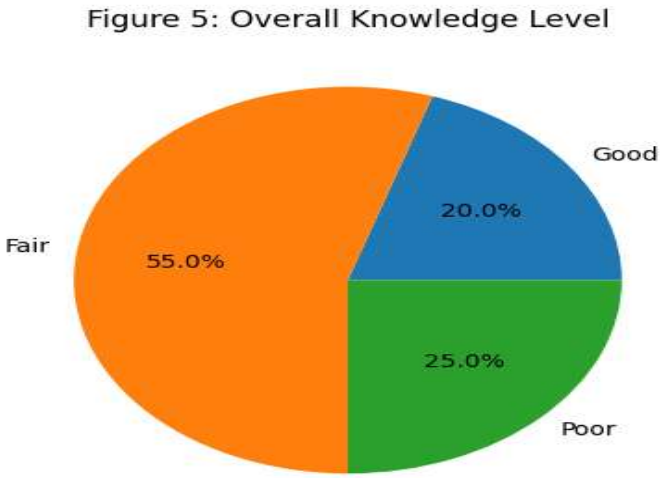
corresponds to fair knowledge, followed by smaller proportions of poor and good knowledge. This visual representation confirms that comprehensive understanding of cervical cancer is limited among the study population, with relatively few respondents being fully informed. The findings suggest that interventions should focus on improving knowledge levels by moving individuals from poor to fair and from fair to good knowledge categories. The dominance of fair knowledge indicates that while respondents have some understanding, it is insufficient for effective prevention and early detection.

Figure 5: Overall Knowledge Level



A pie chart illustrating knowledge classification. Overall, these results demonstrate that although awareness of cervical cancer is high among women in Nandi County, detailed knowledge regarding screening practices remains moderate and inconsistent. The predominance of fair knowledge, coupled with existing gaps and uncertainties, highlights the need for targeted and comprehensive health education strategies to enhance cervical cancer prevention and early detection.

Discussion

The findings of this study demonstrate that although awareness of cervical cancer is high, comprehensive knowledge remains limited. This gap is particularly evident in the understanding of symptoms, HPV infection, and screening practices. Similar findings have been reported in studies conducted in Kenya and other sub-Saharan African countries, where awareness does not necessarily translate into adequate knowledge.

Limited knowledge of HPV is especially concerning, as it is the primary cause of cervical cancer and a key target for prevention strategies such as vaccination. In addition, inadequate knowledge of symptoms may contribute to delayed health-seeking behavior, resulting in late diagnosis and poor outcomes. The discrepancy between awareness and detailed knowledge suggests that existing health education programs may emphasize general awareness but fail to provide sufficient depth of

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information. Therefore, interventions should focus on improving both awareness and practical understanding of cervical cancer prevention. The high level of awareness observed in this study is consistent with previous research conducted in Kenya and other developing countries, where a majority of women reported having heard about cervical cancer (Ng'ang'a et al., 2018; Aduda et al., 2020). This suggests that public health campaigns and health facility interactions have been effective in increasing general awareness. However, as demonstrated in this study, awareness alone does not necessarily translate into adequate knowledge. Similar findings have been reported in studies from Nigeria and Ethiopia, where high awareness levels coexisted with limited understanding of the disease (Getachew et al., 2019; Ozoemena & Okoronkwo, 2019).

The study further revealed that knowledge of cervical cancer symptoms was moderate and characterized by a high level of uncertainty. A substantial proportion of respondents were unable to confidently identify key symptoms such as persistent pelvic pain. This finding is consistent with studies conducted in Ethiopia and India, which reported inadequate knowledge of early warning signs among women (Mengesha et al., 2020; Heena et al., 2019). Poor recognition of symptoms is particularly concerning because cervical cancer is often asymptomatic in its early stages, and delayed identification of symptoms may lead to late diagnosis and poor outcomes. Therefore, improving knowledge of symptoms is essential for promoting early healthcare-seeking behavior. Knowledge of risk factors, including multiple sexual partners and HPV infection, was also found to be moderate. While a majority of respondents were aware of behavioral risk factors such as multiple sexual partners, knowledge of HPV as the primary causative agent of cervical cancer was limited. This finding aligns with previous studies, which have reported low awareness of HPV despite its central role in cervical cancer development (Basu et al., 2019; Zhang et al., 2022). The relatively higher awareness of behavioral risk factors compared to biological causes suggests that health education programs may emphasize general risk behaviors but fail to adequately address the underlying scientific mechanisms of the disease. This gap may negatively affect the acceptance of preventive measures such as HPV vaccination. About screening knowledge, the study found that although a high proportion of respondents were aware of the existence of cervical cancer screening services, their understanding of specific screening methods, eligibility criteria, and recommended intervals was limited. This finding is consistent with studies conducted in Kenya and other African countries, where awareness of screening was relatively high but detailed knowledge remained inadequate (Kinyua et al., 2019; Nyambe et al., 2019). The lack of technical knowledge regarding screening procedures may prevent women from utilizing available services, even when they recognize their importance. This gap highlights the need for health education interventions that go beyond general awareness and focus on practical information, such as how screening is conducted and when it should be performed.

The overall knowledge classification further demonstrated that the majority of respondents had fair knowledge, while only a small proportion exhibited good knowledge and a notable percentage had poor knowledge. This distribution indicates that although women possess some level of understanding, it is not sufficient to support effective preventive behavior. Similar patterns have been reported in studies conducted in sub-Saharan Africa, where knowledge levels were found to be moderate but inadequate for promoting screening uptake (Ngune et al., 2020). The persistence of poor knowledge among a significant

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proportion of respondents underscores the need for targeted interventions aimed at improving both the depth and accuracy of information.

The findings of this study also highlight the importance of addressing the knowledge–practice gap in cervical cancer prevention. Although this article focuses on knowledge, it is evident that incomplete knowledge may contribute to low screening uptake, as women who lack detailed understanding are less likely to engage in preventive practices. Previous studies have demonstrated that knowledge is a key determinant of health behavior, but it must be accompanied by appropriate attitudes and enabling factors to achieve meaningful change (Mafiana et al., 2022; Petersen et al., 2022). Therefore, interventions should adopt a comprehensive approach that integrates knowledge improvement with efforts to address barriers to screening.

The uniqueness of this study lies in its focused assessment of knowledge components within a broader analytical framework. By examining awareness, symptoms, risk factors, and screening knowledge collectively, the study provides a comprehensive understanding of the knowledge gaps that exist among women in a rural Kenyan setting. This integrated approach offers valuable insights for designing targeted health education programs that address specific areas of deficiency.

From a public health perspective, the findings of this study have important implications. First, there is a need to strengthen community-based health education programs to improve knowledge of cervical cancer, particularly regarding HPV infection, symptoms, and screening procedures. Second, healthcare providers should incorporate cervical cancer education into routine maternal and reproductive health services to reach a wider population. Third, the use of mass media and community outreach programs can enhance the dissemination of accurate and practical information. This study has several limitations. The use of convenience sampling limits the generalizability of the findings. In addition, the study was conducted in a single referral hospital and may not represent the wider population. The use of self-reported data may also introduce recall bias

Conclusion

In conclusion, this study demonstrates that while awareness of cervical cancer is relatively high among women in Nandi County, comprehensive knowledge remains moderate and incomplete. Addressing these knowledge gaps is essential for improving cervical cancer prevention, promoting early detection, and ultimately reducing the burden of the disease in resource-limited settings. It is recommended that health education programs be strengthened to improve knowledge of cervical cancer, particularly regarding HPV infection, symptoms, and screening practices. Healthcare providers should integrate cervical cancer education into routine maternal and reproductive health services. Community outreach and media campaigns should also be used to disseminate accurate and practical information.

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