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CERVICAL CANCER SCREENING UPTAKE AMONG HIV/AIDS PATIENTS IN NANDI COUNTY, KENYA

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ABSTRACT

HIV-positive women who live longer with HPV infection, left untreated, run an increased risk of cervix premalignant lesion. The risk of acquiring invasive cervical cancer in HIV/AIDS positive women is ten years earlier than in HIV/AIDS negative women. Cervical cancer poses intense and chronic risk to women lives, losing one woman to cervical cancer every two minutes. This paper focuses on the level of screening for cervical cancer among HIV/AIDS patients in Nandi County, Kenya. The study adopted a descriptive cross-sectional research design employing quantitative approach. 750 HIV/AIDS women patients attending the Comprehensive Care Centre at Nandi County Referral Hospital during the month of July to October 2020 were targeted. A sample of 196, based on Fisher's formula, was drawn. The study used systematic and purposeful random sampling techniques to recruit participants. Primary data was collected using open- and closed-ended questionnaires. Data was coded and entered into Microsoft Excel 2016 and analysed using Statistical Package for Social Sciences, version 25.0. Descriptive statistics were used to analyse data. The study results revealed that 77.4% of women had heard about cervical cancer and its screening, whereas 47.4% had received information from mass media. Of the respondents, 83.2% and 62% had heard of cervical cancer screening and knew any of the screening procedures, respectively. Majority (57.1%) mentioned Pap smear test as a method of screening. Moreover, half (51.05%) reported that they had been screened for cervical cancer while many (48.94%) had never been screened. Furthermore, majority (69.89%) mentioned fear that they had the disease as a reason for not being screened. The study concluded that awareness of cervical cancer and cervical cancer screening has not translated to uptake of screening. Therefore, there is need to increase education on cervical cancer screening and integrate screening with HIV/AIDS Comprehensive Care services.

INTRODUCTION

Cervical cancer screening entails checking for pre-cancerous lesions and cancer in women who may exhibit no signs and are healthy. Pre-cancerous lesions can be treated easily if detected early hence avoiding cancer infections [1]. Additionally, screening can identify cancer at an early stage, allowing women to receive treatment, which is highly effective [2]. In advanced countries, the reductions in cervical cancer occurrence and mortality rates are associated to with the availability of screening services and human papilloma virus (HPV) vaccination programmes. Screening can discover precursors and early-stages of disease for both types of cervical cancer that is squamous cell carcinoma and adenocarcinoma. Management of precursors and early-stage disease can also avoid the development of invasive cervical cancer and reduce cervical cancer mortality [3].

Although HPV vaccination has the ability to significantly reduce the burden of cervical cancer, it does not replace the need for cervical cancer screening. Even in regions where the vaccine is availed, screening should be advanced or reinforced, particularly for women who are already infected with HPV or those who have not yet been vaccinated [4]. Minimizing deaths from cervical cancer requires a comprehensive approach, and it should be based on a multipronged approach, delivering effective programmes throughout the life of the individual. This involves primary prevention (HPV vaccinations) in girls aged 9 to 13 years before their sexual debut, secondary prevention (screening and treatment) for women aged 30 to 49 years, and tertiary prevention (treatment of invasive cervical cancer) for affected women [5].

Granted screening does not prevent HPV infection. However, it potentially prevents most cervical cancer cases and deaths if precancerous lesions are detected early and treated appropriately. In many developed countries, organized, population-based screening of adult women, and early treatment for precancerous lesions of the cervix, has significantly decreased the incidence of mortality from cervical cancer. Screening extent in low- and middle-income countries is generally sub-optimal, and women at the highest risk of this cancer (especially women living with HIV/AIDS) are among the least screened. The rates of screening are below par in low- and middle-income countries in part because of limited resources [4].

A study carried out in Swaziland in 2009 on Female Reproductive Cancer Awareness by the Swaziland Breast and Cervical Cancer Network (SBCCN) established that cervical cancer was the commonest cause of cancer-related hospital admissions among Swazi women. This is attributed to the high prevalence of HIV/AIDS among women in the country. Cervical cancer deaths in Swaziland reached 112% or 0.83% of total deaths as per WHO data published in May 2014 [6]. Contrary cytology-based screening used in high-income countries is currently not attainable in Swaziland due to financial, infrastructure, human resources and technological investments needed for such programmes to be sustained. However, in low-resource settings Visual Inspection with Acetic Acid (VIA) is an evidence-based alternative approach to cytology-based screening for cervical cancer studies, has declared the sensitivity of VIA (77%; range 56-94%) for detecting precancerous lesions comparable to, or greater than, cervical cytology (60%; range 35-84%), thus requires less resources [7].

Additionally, VIA gives prompt output, hence promoting connection of screening with management also if integrated with cryotherapy (freezing of precancerous cervical lesions), particularly in a single visit approach (SVA), is an excellent strategy for secondary deterrence of CC in low-resource contexts, and can be undertaken by competent practitioners [8]. Moreover, Rockville [9] posits that connecting screening with care leads to a reduction in precancerous growths, cervical cancer incidence and mortality. Recommendations are thus needed for specific screening strategies that balance the benefits from early detection of treatable lesions and reduction in incidence and mortality of cervical cancer with potential risks for false positives, needless procedures, among other harms. However, this possible benefits and dangers differ across age, health history and risk factors.

Besides, there are arguments on whom to screen, preferable testing methods (Pap test, HPV testing, or both), and how often to screen [10]. In a recent evaluation informed by the 2008 global estimates of cancer generated by the International Agency for Research on Cancer [11], approximately 529,512 women were reportedly found with cervical cancer matching the annual Age Standardized Incidence Rate (ASIR) of 15.4/100,000. About 274,967 women died from the illness, with a yearly Age Standardized Mortality Rate (ASMR) of 7.8/100,000 [12]. Most of the cases (85.5%) came from developing regions. Works in America and Sweden showed that regular cervical cancer screening with a follow-up of abnormalities substantially limited the occurrence of the illness and death [13]. The American Cancer Society suggests that every woman who is sexually active, or above 21 years old, should screen for cervical cancer yearly for the first 3 subsequent years [13].

Cervical cancer screening in Zambia began in 2006 and, as of 2013, the HPV vaccine had already been piloted. Nonetheless, cervical cancer remains the most common type of cancers. It is assumed that factors that can influence

screening and vaccination practices are knowledge, social interaction, health behaviours and religion. In Nairobi, Kenya, a study among patients at KNH showed that Pap smear testing was more likely if the patient had cervical cancer, was aware of cervical cancer, had some education, had used family planning, or was 35 years of age and above. However, the study also revealed that perception of risk of cervical cancer was not associated with Pap smear testing [14].

Another study conducted in Kenya on risks and obstacles to cervical cancer screening among 219 women attending Comprehensive Care Centre clinic at the MTRH found that only 12.3% had ever been screened [15]. Further, women over 30 years were more likely to have screened for cervical cancer than younger women [15]. Additionally, Were *et al*. found the test positivity rate was 13.9% (VIA) and 16.9% (VILI) among women attending the family planning clinic at the MTRH. Another study was done on women who underwent VIA in HIV/AIDS care and treatment clinics in Kenya from October 2007 to October 2010 to evaluate outcomes of cervical cancer screening. Among the women invited for screening, 87% responded positively of whom 15% had a positive or unsatisfactory VIA [16].

From preliminary data gathered by the researcher at Nandi County Referral hospital, cervical cancer screening began in 2019, and it is carried out once a week specifically on Thursdays with an average attendance of five patients. This shows that women from the region have not fully utilized the available cervical cancer screening services. This gap on low uptake of screening of cervical cancer services is one of the most crucial determinants of inadequate screening status. Aboyeji, Ijaiya and Jimoh [17] established that cervical cancer and Pap testing awareness positively influence the utilization of cervical cancer screening services.

Awareness and Knowledge of Cervical Cancer Screening

A study in Ghana among college students on knowledge and health beliefs on cervical cancer found that there were gaps in information on risk factors and screening intervals [18]. The American Cancer Society avers that HPV is the greatest significant risk factor for developing cervical cancer yet only 7.9% of the participants recognized information on HPV [18].

Women's awareness and knowhow on cervical cancer and its antecedents is top on the list as a main factor affecting uptake of screening. Women with less information on cervical cancer and its deterrence are improbable to seek screening. A study by Lyimo and Beran [19], in Moshi, Tanzania, considering the utmost imperative to use of screening among 354 females aged between 18 and 69, discovered that 59.6% had hardly any knowledge of the illness and its prevention. Moreover, only 80(22.3%) women testified of having been screened. The study also established that those most informed about the illness and its prevention were most expected to be screened than those with low or mid-level knowledge [19]. In Uganda, a survey on influences on uptake of comprehensive care centre in Nsagi community and their effects for screening found ignorance about cervical cancer risk factors as one of the major hindrances to screening uptake [20]. In addition, study among 310 medical workers on knowledge, disposition and conduct around cervical cancer screening in Mulago Hospital, Uganda, found that less than 40% were informed of the risk factors. However, 81% had never gone for screening [20].

In Kenya, an investigation at the Kenyatta National Hospital (KNH) found that about half (51%) of respondents were aware of cervical cancer, 32% knew about Pap smear and only 22% had gone for screening. Moreover, there were no significant differences in knowledge between cervical cancer and non-cancer patients [14]. Women, aware of cervical cancer, were expected to have screened for cervical cancer. For instance, in a cross-sectional study in Kenya among 384 female primary school teachers on awareness of cervical cancer predisposing factors and practice of Pap smear testing, 87% of the women were aware about cervical cancer and 75% knew about the Pap smear test [21].

It is critical to underline that only about 39% knew that HPV infection was a risk factor for cervical cancer and only 41% had been screened before [21]. Another work done in Thika among 498 women on factors affecting use of cervical cancer found that lack of information on the cancer and the benefits of early identification measures were critical barriers to screening with 17.3% of the women who had ever gone for cervical cancer screening [22]. Additionally, Gichangi *et al.* [14] carried out a study in maternal and child health clinic in Nairobi`s Kayole Sub-County Hospital. The findings revealed that many HIV/AIDS positive women had poor knowledge on importance of a pap smear and half of the participants had never heard of it. Moreover, those with an idea of it had not appropriated it, safe for a health recommendation. Furthermore, another study conducted at KNH in Nairobi Kenya revealed that, Pap smear was more likely if the patient was aware about the cancer, or had some education, or had used family planning or was 35 years and above [14]. Nevertheless, the study revealed that perception of risk of cervical cancer was not associated with Pap smear.

Another study in Nyeri, Kenya, established that despite the study group consisting of well-educated females with autonomy in decision making and strong kin support, use of cervical cancer screening was low as 24.7%. Only less than 20% of them knew the importance of cervical cancer testing and majority (80%) of the participants could only mention one to two risk factors of cervical cancer [23]. Absence of information and screening compounded with the unavailability of HPV vaccines are barriers to Kenya's struggle against cervical cancer.

In Nandi County, with the diminished number of women going for screening, which is only conducted on Thursdays, there are gaps on knowledge; a factor affecting uptake of cervical cancer screening. Inadequate knowledge and lack of awareness in regard to cervical cancer and the benefits of early detection measures are linked as critical barriers to screening which therefore needs to be addressed.

Problem Statement

HIV-positive women who live longer with HPV infection, left untreated, run an increased risk of cervix premalignant lesion. The risk of acquiring invasive cervical cancer in HIV/AIDS positive women is ten years earlier than in HIV/AIDS negative women [24]. Cervical cancer poses intense and chronic risk to women lives, losing one woman to cervical cancer every two minutes. According to WHO [25], HIV/AIDS infected women are five times more at risk compared to HIV negative women. In Zambia Cervical Cancer Prevention Programme demonstrated that linking cervical cancer screening and HIV/AIDS services is a cost effective way of improving cervical cancer screening and treatment [26]. This programme, which integrated a national cervical cancer deterrence strategy into an existing HIV/AIDS programme, led to an expansion of cervical cancer screening to more than 100 000 women (28% of whom were living with HIV/AIDS) over a period of five years [26].

This study endeavoured to assess determinants of cervical cancer screening uptake among HIV/AIDS patients in Nandi County, Kenya. With the recognition that cervical malignancy is a major cause of illness and death among HIV/AIDS-positive women, the HIV/AIDS strategy in Kenya is making significant efforts in incorporating this cancer's screening under the minimum comprehensive care package [27]. In Nandi County, there is still a challenge since patients diagnosed with HIV/AIDS are not screened for cervical cancer because of fear that they might already have the disease, and low knowledge on the availability of cervical cancer screening services and its importance [28].

The problem in Nandi County is compounded by lack of sufficient guidelines for prevention and treatment strategies for cervical cancer which largely is based on limited evidence in Kenya. Although many women may be saved by anti-retroviral therapy, they may later die of a disease that could have been detected and prevented at the facilities where they receive their anti-retroviral therapy since majority of clinicians do not carry out other investigations when the patient has a known chronic disease [28]. Efforts to prevent and control cervical cancer in HIV/AIDS patients are quite challenging. Therefore, this study sought to assess determinants influencing cervical cancer screening uptake among HIV/AIDS patients in Nandi County, Kenya.

MATERIALS AND METHODS

This was a descriptive cross-sectional study design. It was conducted for a period of three months (from 7th January to 7thApril 2020). The study was undertaken at the Nandi County Referral Hospital, which had six sub-county hospitals at the time of study. Nandi County is located in the Rift Valley region of Kenya.

The study targeted all HIV/AIDS-positive women attending routine care at the Comprehensive Care Centre, Nandi County Referral Hospital clinic, during the study period. This population comprised women aged between 18 and 70 years who voluntarily consented to participate in the study. All HIV/AIDS-positive women attending the Comprehensive Care Centre and had given their informed consent to participate in the study were included. Conversely, all HIV/AIDS-positive women who were not willing to participate in the study were excluded.

A sample size of 196 women was calculated using Fisher's formula [29] based on 95% confidence interval and assuming the uptake of cervical cancer screening of 22.3% based on data from a previous study on a similar population in Moshi, Tanzania [19]. The number of all women attending Comprehensive Care Centre at Nandi County Referral Hospital was approximately 750. To get the desired sample size (nf) from this population (which was less than 10,000), the following formula for infinite population by Fisher [29] was used.

$$nf = \frac{n}{1 + n/N}$$

Where:

n = 266 (The desired sample size, when the study population is less than 10,000)
N = 750 (the estimate of all women attending Comprehensive Care Centre at Nandi County Referral Hospital)
nf = 266/1+ (266/750)
nf = 266/1+0.3547
nf = 266/1.3547
nf = 196 (the sample size)

Systematic sampling and purposeful random sampling were used to select the study participants. Primary data was collected through a questionnaire with both closed- and open-ended questions. The researcher and a research assistant assisted respondents who interpreted some of the questions that could not be understood by the respondent. Data was collated and entered in Microsoft Excel 2016 and analysed using Statistical Package for Social Sciences, version 25.5. Descriptive statistics were computed to generate frequencies, percentages and mean.

RESULTS

Clinical Characteristics of the Participants

The participants of this study were women living with HIV/AIDS. The progression of HIV/AIDS depends on some clinical characteristics, including use of anti-retroviral therapies (ART) and other existing medical conditions. Table 1 shows the clinical characteristics of the participants, which include the time since HIV/AIDS diagnosis, duration of taking ART and any other pre-existing medical condition.

Table 1: Clinical characteristics of Nandi County Women Followed in the CCC in Nandi County Referral hospital (n=190)

Characteristics	Frequency	Percentage (%)
Time since HIV/AIDS diagnosis		
Less than 1 year	10	5.3
1-2 years	123	64.7
More than 2 years	57	30.0
Duration of ART (years)		
Less than 1 year	60	31.6
1-2 years	93	48.9
More than 2 years	37	19.5
Had other medical conditions		
Hypertension	65	34.2
Diabetes	56	29.5
Stress	48	25.3
Others	21	11.1

Notably, out of 123 patients who knew of their HIV positive status within 1-2 years, only 93 were taking ARTs, showing that the rest had delayed in starting their ARTs. The delay in ARTs could lower their immunity and make them more susceptible to develop opportunistic infections associated with lowered immunity, and cervical cancer. Co-morbidities can also influence the clinical outcome of patients. A bigger number of the participants reputed to have had hypertension (34.2%), diabetes (29.5%), and stress (25.3%) besides other medical condition (Table 1).

Cervical Cancer Awareness

This is important as women will understand the role that regular screenings plays in cervical health. A regular screening test detects abnormalities before development of cancer. Majority (147, 77.4%) were informed on cervical cancer, whereas 22.6 % (43) had never heard of cervical cancer (Figure 1).

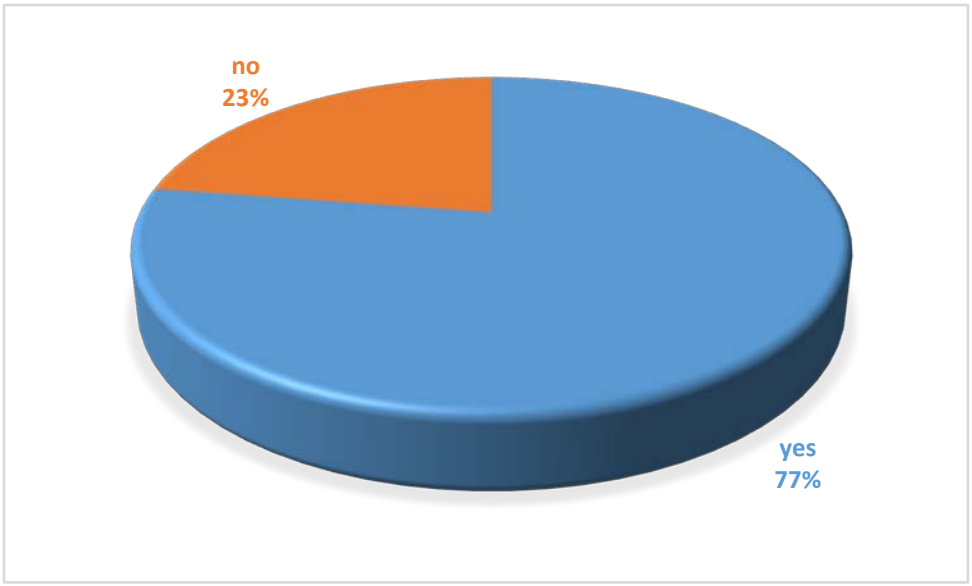

Figure 1: Awareness of Cervical Cancer among Women with HIV

"Yes" and "No" represents participants who were familiar and not familiar with cervical cancer, respectively.

Source of Information on Cervical Cancer

There were several sources of health information in Nandi County, including the electronic media and other people. To determine where the participants get information on cervical cancer, they were asked to choose from mass media (TV, radio), friends and health professionals, which is their main source. The dominant source of information from the participants on cervical cancer was through mass media (radio, TV) (90, 47.4%), followed by health professionals (66, 34.7%) while the least had heard about it from friends (34, 17.9%) (Figure 2).

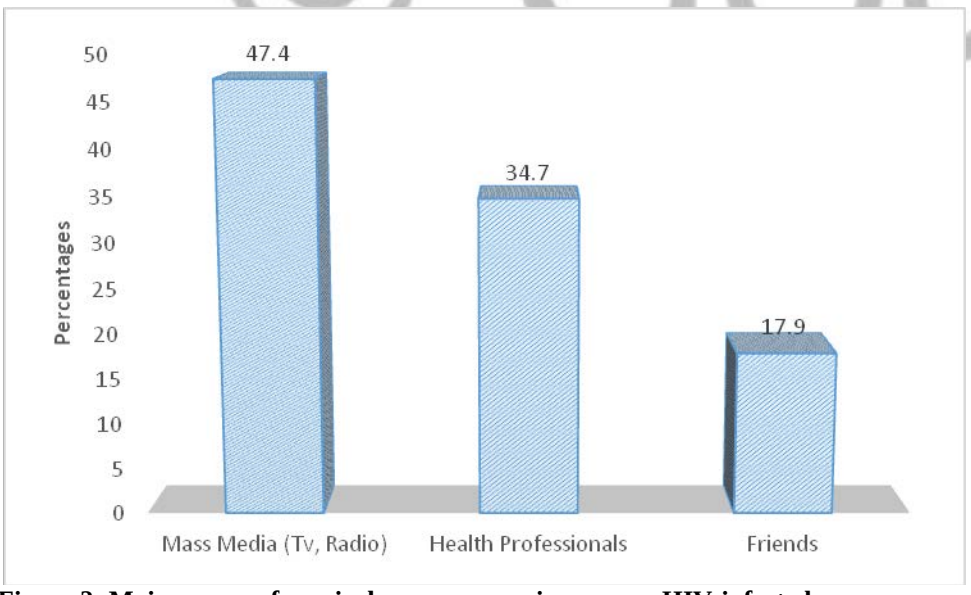

Figure 2: Main source of cervical cancer screening among HIV-infected women

The columns represent the proportion of participants and their preferred source of information.

Risk Factors for Cervical Cancer

Several aspects increase a woman's risk of getting cervical cancer [21]. However, exhibiting one or more predisposers does not imply that one will definitely get cervical cancer; instead, the more the risk factors the greater the likelihood of getting cervical cancer. When asked on who is most vulnerable, majority the of participants (107,

56.3%) reported women with multiple sexual partners as the main predisposing factor to cervical cancer while the rest of the aspects included women infected with HIV, women exposed to repeated STIs, women who have sex before 18 years and women who bear too many children at 53(27.9%), 20(10.5%), 5(2.6%) and 5(2.6%), respectively (Figure 3). The results showed that many of the participants recognize that they are at risk of developing cervical cancer because of their HIV status and that having multiple sexual partners is the greatest risk.

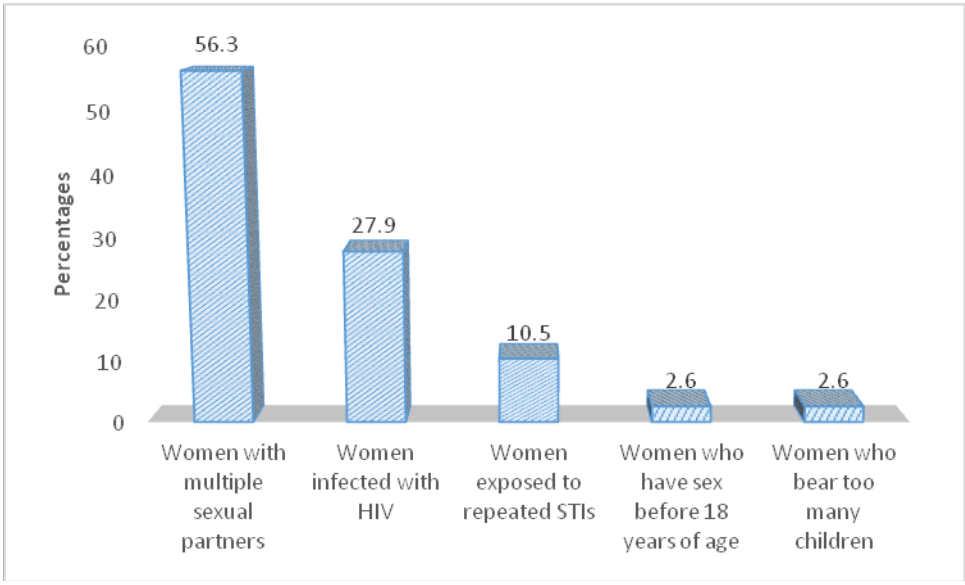

Figure 3: Risk factors for cervical cancer identified by participants

Ability to Identify Cervical Cancer Symptoms

The ability of women vulnerable to cervical cancer to identify its manifestations early, and seek medical attention is important for early detection and therefore better outcomes. These include pain during sex, abnormal menstruation and abnormal vaginal discharge or bleeding. This knowledge could help the participants as well as friends and family. The participants were, therefore, asked whether they could recognize indicators of cervical cancer. There was a slight difference between those who could (94, 49.5%) and those who could not (96, 50.5%) identify the symptoms.

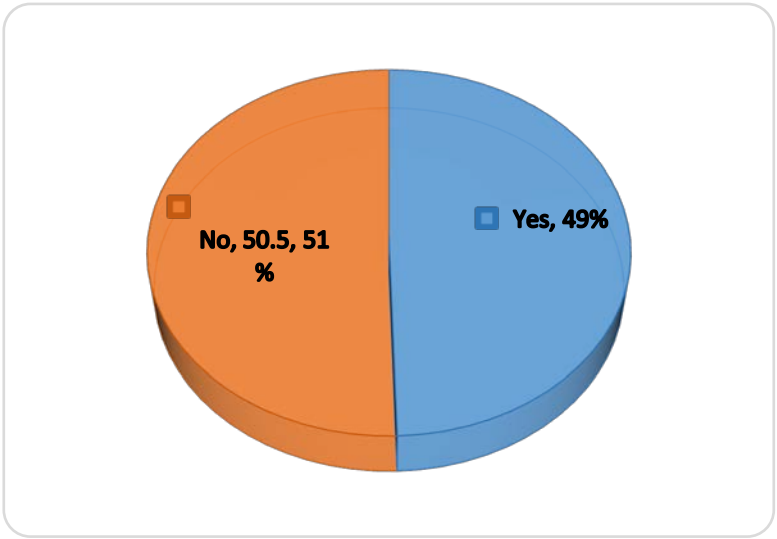

Figure 4: Percentage of participants and their ability to notice cervical cancer symptoms

Yes" and "No" represents those who can identify cervical cancer symptoms and those who cannot, respectively".

Knowledge of Cervical Cancer Signs and Symptoms

To assess the participants' knowledge of the cervical cancer signs and symptoms, the 94 participants who were able to identify cervical cancer signs were asked to identify one among four others (Table 2). A majority of participants mentioned excessive vaginal discharge (54, 75.4%), followed by (47, 50%) who mentioned bleeding and pain after intercourse followed by abnormal bleeding between menstruations (45, 47.9%) and the least group mentioned offensive vaginal discharge (42, 44.7%).

Table 2: Respondent's Knowledge on Signs and Symptoms of Cervical Cancer

Signs and symptoms of cervical cancer	Yes	No
Offensive vaginal discharge	42 (44.7%)	52 (55.3%)
Excessive vaginal discharge	54 (57.4%)	40 (42.6%)
Abnormal bleeding between menstruations	45 (47.9%)	49 (52.1%)
Bleeding and pain after sexual intercourse	47 (50%)	47 (50%)

Table 2 has two possible responses, yes and no. and it is considered dichotomous. The 'Yes' asserts a positive response, which means participants answered while 'No' asserts a negative answer, never responded to the question. The participants gave their opinion for each item.

Awareness about Uptake of Cervical Cancer Screening

Responses to items on screening awareness uptake are summarized in Table 3. Most (158, 83.2%) and many (98, 51.6%) had heard of cervical cancer screening and knew a screening procedure, respectively. Majority of the participants (56, 57.1%) mentioned Pap smear test as a method of screening while (49, 50.5%) had been screened once and (65, 69.9%) who had never been screened mentioned that they feared that they would be found to have the disease hence afraid to screen (Table 3).

Table 3: Cervical Cancer Screening Practices among Women Living with HIV/AIDS

Variable	Frequency	Percentage (%)
Aware of cervical cancer screening		
Yes	158	83.2 %
No	32	16.8 %
Knew any cervical cancer screening procedure		
Yes	98	51.6 %
No	92	48.4 %
Methods used for screening		
Pap smear test	56	57.1%
VIA (Visual inspection using acetic acid)	26	26.5%
Colposcopy	6	6.1%
Biopsy	8	8.2 %
Others	2	2 %
Had ever been screened		
Yes	97	51.05%
No	93	48.94 %
Number of times screened		
Once	49	50.51 %
Twice	25	25.77%
Thrice	12	12.37 %
More than four times	11	11.34 %
Reasons for not screened for Cervical cancer		
Fear of already having the disease	65	69.89 %
Unable to afford	2	1.1 %
Lack of information on where to go for the first test	2	1.1 %
Lack of screening services in the hospital	5	2.6%
Others	5	2.6%

Majority, 158(83.2%), of the participants were aware of the cervical cancer screening services but does not translate to the uptake of cervical cancer screening as supported by the findings of 51.1% being those who have ever been screened. Additionally, majority could not clearly identify the indicators of the cancer unlike those who could

distinguish, which was equated to the level of education of the participants. Overall, most women reported that they had not screened for cervical cancer because they feared a positive cervical cancer testing.

Cervical Cancer Prevention

Early detection and intervention on cervical pre-cancerous lesions prevents higher percentage of cervical cancers. In this regard, the study focused on whether the participants had knowledge on whether cervical cancer is preventable. Majority (150, 78.9%) reported that cervical cancer is preventable while (40, 21%) participants thought cervical cancer is not preventable (Figure 5).

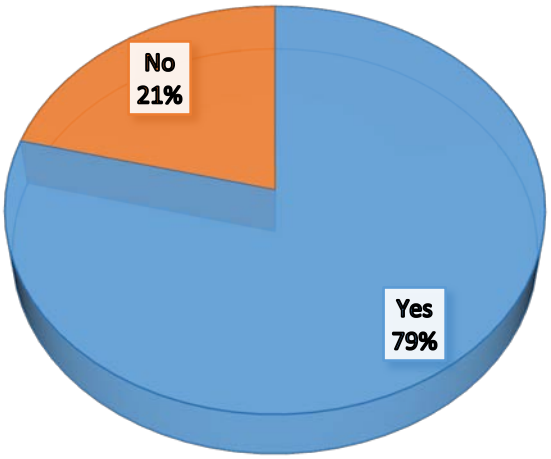

Figure 5: Participants' perception on prevention of cervical cancer

"Yes" and "No" represents those who think cervical cancer is preventable and non-preventable, respectively.

Modes of Cervical Cancer Prevention

Several actions can be taken by women to help prevent cervical cancer. These include regular screening for pre-cancerous lesions and using the HPV vaccine. Majority (90, 47.4%) acknowledged that having regular Pap test is a way of deterring cervical cancer from developing. The other modes of prevention identified include the use of condoms (56, 29.5%), limiting the number of sexual partners (38, 20%) and the least being delaying sexual debut (6, 3.2%).

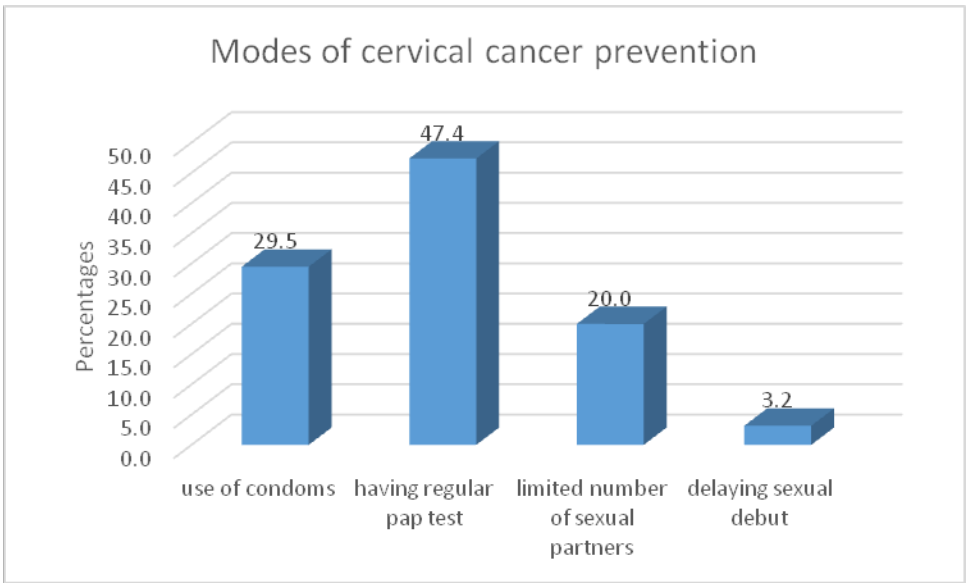

Figure 6: Prevention modes of cervical cancer as identified by participants

Treatment Option

There are various treatments for patients with infection cervical cancer, including chemotherapy, radiotherapy and surgery. The study on treatment options shows that the participants were aware, and most (124, 65.3%) identified chemotherapy as the ideal way to treat cervical cancer, whereas (42, 22.1%) were unaware of any. Another (19, 10%) pointed radiotherapy and the least (5, 2.6 %) indicated surgery as a treatment option.

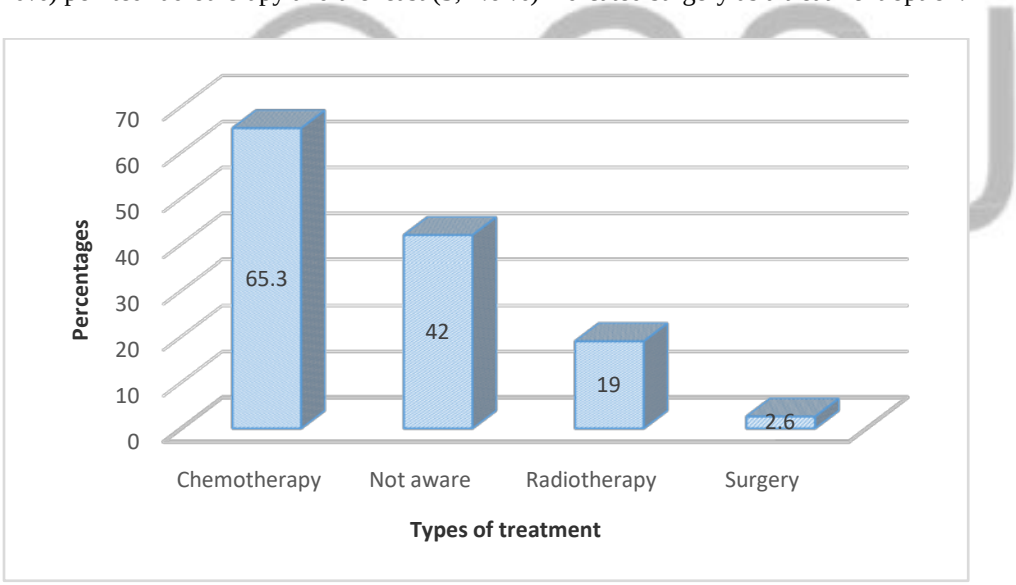

Figure 7: Cervical cancer treatment options

Taken together, these results suggest a bigger number knew of cervical cancer, the risk factors associated with it, and the treatment and prevention options available. These comprised the variables, which had a significant relationship to screening of cervical cancer uptake. Participants with diploma level were likely to turn up for screening relative with their counterparts who have done certificate as they were more knowledgeable and, therefore, it might mean a high chance of seeking screening. The findings also indicated that those with diploma were employed but unfortunately earning less money and still they could be screened.

DISCUSSION

The study revealed that larger number of participants was aware of cancer of the cervix. The findings related with those of Assoumou *et al.* [30] who established that 91.6% of the Gabonese women were aware of cervix cancer. The main source of information regarding awareness of the cervical cancer was from the mass media (TV, radio) 47.4%. Moreover, a few of them reported health professionals as their source of information. This was in line with a study

by Adibe and Aluh [31], where mass media was acknowledged as the primary source of information (23%) about cervical cancer. The role of media in the transmission of knowledge may become more effective if Kenyan government will engage more in social media. Social media constitute the new space where groups and individuals interact daily and exchange data [32].

Having information on the causes and risk factors of cervical cancer is valuable for a woman in order to take preventive measures and to revolutionize behaviour. In this regard, majority of the women were able to recognize at least one risk factor, such as infection of HIV, multiple sexual partners, having sex before 18 years and women bearing too many children. Generally, from the findings, there was low knowledge for cervical cancer risk factors, which is similar with the findings of Anorlu *et al.* [33].

Another noteworthy finding was that many mentioned Pap smear test as a screening method for cervical cancer. This is compatible with the finding that the larger numbers of women were aware of the illness. Contrary, Franceschi and Jaffe [28] found that most women were not aware of the available methods of screening or screening facilities, where one could obtain a screening service, which is quite important to screening uptake of cervical cancer and treatment.

However, the outcome from this study is contrary with those of Wright *et al.* [33] who reported that only 5.1% of females in Lagos had ever undertaken Pap smear. However, Assoumou *et al.* [30] found that 65.1% of the women interviewed in Gabon had gone for Pap smear test before and the explanation for higher figure is that HIV-positive women are encouraged to go for screening due to the higher human papilloma virus (HPV) prevalence and CC incidence than HIV-negative women. Long time since HIV diagnosis or ARV treatment can also be linked with CC awareness. With increased life expectancy following the introduction of ART, HIV/AIDS positive women are at a high risk of cervical cancer due to immune suppression by HIV infection. However, Mboumba *et al.* [35] affirmed that HIV-infected women should be informed of the importance and benefits of the Pap smear test in the prevention of cervical cancer, particularly in the era of intensive widespread use of combination antiretroviral treatment in the sub-Saharan Africa and its implications on the life expectancy of this highly at-risk population, is of crucial importance.

In view of the results of this study, the main reason mentioned for not seeking screening test was fear of having the disease. This agreed with the study by Bessler, Aung and Jolly [36], which identified a number of barriers to screening, including fear that their health provider would find cervical cancer as the result of a Pap smear, and nearly half revealed that they feared the pain of Pap test. The study underlined that majority knew that cervical cancer can be prevented, which is in contrary with the views by Eze *et al.* [37] who reported that few women had a know-how of cervical cancer deterrence which is attributed by the difference in education level between the two study's with 25.3% and 94.0% in tertiary education respectively. Moreover, almost all respondents identified chemotherapy as the best treatment method of cervical cancer while the least 2.6% (5) indicated surgery as a treatment option. The findings were similar to Jia *et al.* [38] where about 81% were knowledgeable of the potential curability of cervical cancer.

CONCLUSION AND RECOMMENDATIONS

From the study results, the overall knowledge level on uptake of cervical cancer screening was low among women living with HIV/AIDS compared with their vulnerability to the problem and the available risk factors among study subjects. Having heard about cervical cancer from mass media and health workers, being 30 years and above, knowing indicators of the illness, knowing procedures for screening and considering women with multiple sexual partners as at risk of cervical cancer were factors attributed to screening of cervical cancer uptake. In sum, the level of cervical cancer screening as revealed by this study was at 51.1%.

Based on the study findings and conclusion, it is recommended that standard operating procedures should to be developed by Ministry of Health to ensure women who are HIV positive take up cervical cancer screening service. Additionally, Nandi County should link Cervical Cancer screening and HIV/AIDS services since it is a cost effective way of improving cervical cancer screening and treatment. There is also a need to undertake further research on the effect of male partner involvement in cervical cancer screening to see if it will have some positive influence on uptake of cervical cancer screening among HIV/AIDS positive women.

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