Demographic Factors Associated with Uptake of Cervical Cancer Screening among HIV/AIDS Patients in Nandi County, Kenya

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ABSTRACT

Introduction: Cervical cancer is an AIDS-related sickness, since HIV-positive women have a higher incidence of persistent HPV infection, which increases the risk of developing premalignant lesion of the cervix. Early detection by screening is one way to manage cervical cancer. The study assessed the socio-demographic determinants of cervical cancer screening uptake among a target of 670 HIV/AIDS patients attending the Comprehensive Care Centre at Nandi County Referral Hospital between July and October 2020 in Kenya. **Methods:** It adopted a descriptive cross-sectional research design, employing quantitative approach. The sample size was 190, calculated using Fisher's formula. Sampling was by systematic and purposeful random techniques. Primary data was collected using an open- and closed-ended questionnaire. It was then analysed using Microsoft Excel and Statistical Package for Social Sciences, Version 25.0. Descriptive statistics were used to generate frequencies, percentages and means for presentation. Chi-square test of independence and logistic regression helped to test for association between socio-demographic factors and uptake of cervical cancer screening. **Results:** From the findings, the average was 33.8 years; majority were Christian (94.2%) and most, 152(80%), had over two children. A significant relationship existed between age (0.003), level education (0.001), and uptake of cervical cancer screening ($p < 0.05$). However, marital status (0.904) and number of children (0.829) did not significantly influence uptake of cervical cancer screening ($p > 0.05$). **Conclusion:** Evidently, socio-demographics of HIV-positive women greatly influence their uptake of cervical cancer screening. Consequently, the government should increase awareness on cervical cancer screening through in the county health facilities and in communities.

Key words: Socio-Demographic, Cervical Cancer Screening, HIV/AIDS Patients, HPV Infection.

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INTRODUCTION

Cervical cancer is a type of cancer that occurs in the cells of the cervix. Human papilloma virus (HPV) is a sexually transmitted infection that plays a role in causing most cervical cancers. As such, women living with HIV/AIDS who get infected with HPV are more likely to develop pre-invasive lesions that can, if left untreated, quickly progress to invasive cancer.[1] In fact, women living with HIV/AIDS are at 4-5 times greater risk of developing cervical cancer, which is the second greatest common form of cancer popular in women living in low- and middle-income countries.[1] In 2012, 528,000 fresh cases of cervical cancer were detected, and 266,000 women died of the disease, with nearly 90% of them in low- and middle-income countries.[2] These deaths are avoidable because cervical cancer is preventable and curable if detected early.[2]

The Human Papilloma Virus (HPV) is a notable contributor to worldwide morbidity and mortality each year, instigating diseases that range from benign lesions to invasive cancers.[3] Projections based on the GLOBOCAN estimate that the burden HIV/AIDS places on women, predominantly teenage girls and young women from low- and middle-income countries is compounded by the international problem of HPV infections and cervical cancer.[3]

Synergies between the HIV/AIDS response and exertions to prevent diagnose and treat cervical cancer through HPV vaccination, education, screening and treatment must be maximized. The burden of cervical cancer seems to be growing in developing and developed countries, showing a substantial rise in its morbidity and mortality, which is attributed to lack of screening services and monetary constraints linked with these services among women in the developing countries.[4] There is absence of or poor organization of screening services on cervical cancer in developing countries and this has steered the upsurge in deaths associated with cervical cancer.[5] Providing screening opportunities and creating awareness for cervical cancer is certainly one of the greatest operative ways of endorsing access and utilization of these services. Screening is a person's decision reached upon self-perception and deliberations on the significance of such services. Cervical cancer is the easiest gynaecologic cancer to prevent, with regular screening tests and follow-up.[6]

Demographic Characteristics and Cervical Cancer Screening

Cancer of the cervix occurs predominantly in women over the age of 40.[7] Average numbers of new cases of Cervical Cancer reported in Kenya by age are 1002 (15-44 years), 650 (45-54 years), 555 (55-64 years) and 428 (65+ years).[8] Even though the incidence rates of cervical cancer are lower in women below 15 years of age, it is important to vaccinate these women against HPV, if the war against cervical cancer is to be won.[8]

Wangi and Lin studied the socio-demographic factors associated with non-participation in cervical cancer screening among Taiwanese women.[9] The study revealed that 40% of women sampled never had a pap smear and 86% had not had one in the past year. Majority also reported age as the strongest factor affecting cervical cancer screening, particularly for women below the age 30 and above 65 year olds. Women aged 65 years and older were found to be 13 times more likely not to have had a pap smear in the past year, while women aged less than 30 years were more likely to have had a pap smear test in the past 3 years.[9] A related study by Hayward and Swan also found that age was the most important factor in determining Pap smear use with higher rates of participation among the middle-aged groups (40-60 years).[10]

Regarding age, therefore, rates of screening are substantially lower in younger women aged 20-29 years and elderly women aged 60 years and above.[11] A study in Kenya on the risks and barriers to cervical cancer screening among 219 women attending MCH-FP clinic at the Moi Teaching and Referral Hospital (MTRH) found that only 12.3% of the participants had ever been screened. In another study in Kenya, women aged over 30 years were more likely to have screened for cervical cancer than younger women.[12]

Concerning marital status, studies have found that unmarried and widowed women are less likely than married women or women living with a partner to go for screening.[11] In addition, some studies have found that single women are more likely than married women to have pap screening.[13,14] A study conducted in India revealed that failure to have the cervical cancer screening done is associated with marital status since women in the study said they were only allowed to go for a Pap smear test once they were married.[15] A cross-sectional study with 424 participants conducted in Namibia investigated the determinants of cervical cancer screening among women of reproductive age 18-49. The findings indicated that a high number of married women were screened for cervical cancer compared to a low number of single and widowed women who were screened.[16] Therefore, in Namibia, as opposed to India, all sexually active women are eligible for the test irrespective of their marital status.

Evidently, from the above studies, there is need to strengthen patient advocacy in international settings to build a global grassroots movement that portrays accurate perceptions of cancer regardless of the marital status. This recommendation has been underscored by Ndikom and Ofi who also suggest the need to prevent stigma from inhibiting people in their cancer control efforts.[17] Moreover, the scholar underscores the need to help people affected by cancer receives the support, services, and information they need.

As already mentioned, several studies have found that majority of women with high screening rates also happen to have a high level of education.[11] However, another study has also reported that women with high education may not necessarily seek screening so that additional factors related to women's education must be sought to explain uptake of screening services.[18] Wong *et al.* conducted a study among Malaysian women and found that women who were younger than age 43 had achieved a secondary level of education or higher.[19] Moreover, those who were employed outside of the home were more likely to have a positive attitude towards screening before receiving information.

Gatune and Nyamongo undertook an ethnographic study among rural women in Limuru, Kenya, and established that about 40% knew of cervical cancer.[20] The most common source of information on cervical cancer was friends (73.4%), followed by radio (21.9%), books, articles and magazines (20.3%), educational talks at the hospital (18.8%), television (7.8%), seminars/conferences (6.3%) and experience or knowledge with someone who had suffered from disease (6.3%). Meanwhile, 70% preferred education on cervical cancer and its prevention to be in places frequented by women.

In Nandi County, the National Council for Population and Development conducted a qualitative survey to establish the health issues affecting young women in Nandi County.[21] The results of the study indicated that women with a secondary level of education or higher were significantly more likely to be aware of cervical cancer and screening compared to those with lower levels of education. This was also witnessed during the interpersonal one-on-one conversations in informal settings (qualitative observations). Therefore, education level is an important determinant for sexual and reproductive health particularly among girls. Girls who complete secondary and higher education have better sexual and reproductive health outcomes – they are less likely to have unwanted pregnancies and more likely to have higher socio-economic status.[22]

From the studies there were gaps in awareness and education about the etiology, risk factors, symptoms, necessity of screening, and availability of treatment options. Further, women should be informed about recommended age for first screening and frequency of re-screening. In essence, education was found to be an important determinant of awareness of cervical cancer and screening in this study population.

Problem Statement

HIV/AIDS-positive women who live longer with HPV infection that is left untreated are at an increased risk of developing premalignant lesion of the cervix. The risk of developing invasive cervical cancer in HIV/AIDS-positive women is ten years earlier than in HIV/AIDS-negative women.[2] Cervical cancer poses a serious and persistent threat to women's lives, with one woman dying of cervical cancer every two minutes. HIV/AIDS infected women are up to five times more at risk of contracting cervical cancer.[1]

The Cervical Cancer Prevention Programme in Zambia has demonstrated that linking cervical cancer screening and HIV/AIDS services is a cost-effective way to improving cervical cancer screening and treatment.[23] This programme, which integrated a national cervical cancer prevention programme 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. Therefore, this study endeavoured to assess determinants influencing cervical cancer screening uptake among HIV/AIDS patients in Nandi County, Kenya.

With the recognition that cervical cancer is a major cause of morbidity and mortality among HIV/AIDS-positive women, the HIV/AIDS programme in Kenya is making significant efforts to integrate cervical cancer screening into the minimum comprehensive care package.[24] In Nandi County, there is still a challenge since when the patients are diagnosed with HIV/AIDS they do not bother to be screened for cervical cancer because of fear that they might have the disease and low knowledge on the availability of cervical cancer screening services and its importance.[25] Furthermore, Nandi County lacks 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 die later 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 bother to carry out other investigations when the patient has a known chronic disease.[25]

Efforts to prevent and control cervical cancer among women living with HIV/AIDS are quite challenging, and that is why the study sought to assess the socio- demographic determinants of uptake of cervical cancer screening services among HIV/AIDS patients in Nandi County, Kenya.

MATERIALS AND METHODS

The study was conducted at the Nandi County Referral Hospital, which oversees six Sub-County Hospitals. A descriptive cross-sectional design, incorporating quantitative approach, was used in this study. The study targeted 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 and who voluntarily consented to participate in the study. Therefore, in sampling the respondents, the inclusion criterion was all HIV/AIDS-positive women attending the Comprehensive Care Centre and had given their informed consent to participate in the study. The exclusion criterion was all HIV/AIDS-positive women who were not willing to participate in the study. The sample size comprised 190 women, which was calculated using Fisher's formula based on 95% confidence interval.[26] The study also assumed the uptake of cervical cancer screening of 22.1% based on data from a previous study on a similar population in Moshi, Tanzania.[27]

Formula: $n = Z^2 ([P (1 - P)]/ d^2$

Where:

n = the required sample size

Z = the critical value associated with the level of significance

P = the estimated Sero-prevalence (0.223)

d = degree of precision chosen for the study

Therefore, in the study:

Z = 1.96 for 95% level of confidence

P = 0.223

d = 0.05 degree of precision

$n = 1.96^2 [(0.223 (1 - 0.223)] 0.05^2$

n = 266.

Where:

n = 266 (the desired sample size [when the study population is less than 10,000])

N = 670 (the estimate of all women attending comprehensive care centre at Nandi County Referral Hospital)

Nf = 266/1+ (266/670)

nf = 266/1+0.3547

nf = 266/1.3547

nf = 190 (the sample size)

Systematic sampling and purposeful random sampling were used to choose the study participants. To calculate the sampling interval, the following method was adopted:

Nth Value = N (Total population)/n (Sample size)

Nth value = 670/190

= 3.5263 (rounded off to one decimal place)

= 4

The participant was chosen randomly, that is every fourth person and subsequent clients chosen by adding the sampling interval of 4 to the previous chosen number.[28] The participants were selected based on their ability to provide complete information.[29]

Primary data was collected through questionnaire with both closed- and open-ended questions. The respondents were assisted by the researcher and a research assistant who interpreted some of the questions that could not be understood by the respondent. Data collection tools were piloted and suggestions made were incorporated into the final questionnaire. Data was collated and entered into Microsoft Excel 2016 and analysed using Statistical Package for Social Sciences, Version 25.5. Descriptive statistics were computed to generate frequencies, percentages and mean. Chi-Square test of independence and logistic regression were used to test for association between socio-demographic factors and uptake of cervical cancer screening. Logistic regression was performed to identify factors that were significantly associated with uptake of cervical cancer screening. The level of statistical significance was set at a *p* value < 0.05. The odds ratio and 95% confidence interval were tested to determine factors that were significantly associated with uptake of cervical cancer screening among the respondents.

RESULTS

Demographic Characteristics of the Respondents

Among the factors that were examined in the study were the age, level of education, religion and marital status of respondents. Age is especially a key factor in the assessment of risk factors. It is known that cervical cancer affects women between age 25-65.[30] Infection by HPV can, however, occur earlier than 25 years in the sexually active women. Out of the total extracted data, majority of the women, 64(33.7%), were aged 30-39 years while the least, 16(8.4%), were aged 10-19, and those above 50 years were 16(8.4%). The mean age of the patients was 33.8 years. Regarding marital status, 84(44.2%) respondents were married and the rest, 70(36.8%), 17(8.9%), 13(6.8%) and 6(3.2%) were single, widowed, divorced and separated, respectively (Table 1).

Table 1: Demographic Characteristics of the Respondents.		
Demographic Characteristics	Frequency	Percentage
Age in years		
10-19	16	8.4
20-29	58	30.5
30-39	64	33.7
40-49	36	18.9
above 50	16	8.4
Marital status		
Single	70	36.8
Married	84	44.2
Separated	6	3.2
Widowed	17	8.9
Divorced	13	6.8
Level of education		
Certificate	58	30.5
Diploma	66	34.7
University	29	15.3
Masters	18	9.5
Primary	11	5.8
Secondary	8	4.2
Number of children		
0-1	38	20.0
>2	152	80.0
Religion		
Christian	179	94.2
Muslim	9	4.7
Atheist	2	1.1

Further, on level of education majority, 66(34.7%) had diploma while those with secondary level education were the least, 8(4.2%). Concerning the number of children, majority of the respondents had had more than two children, 152(80%), while the least, 38(20%), had at least one child. Regarding religious affiliation, majority were Christians, 179 (94.2%), followed by Muslims and atheists with 4.7% and 1.1%, respectively (Table 1). Collectively, the data shows that majority of the respondents were married or single adults who had attained higher education and had some form of religious affiliation.

Demographic Factors Associated with Uptake of Cervical Cancer Screening

Majority of the HIV positive women who visited the hospital were between 20 and 39 years old, which is within the risk group. Interestingly, there were a small proportion of mainly teenage women, between 10 and 19 years old, who visited the Health Centre for HIV/AIDS care. This implied that teenage women in Nandi County were also at risk of cervical cancer by virtue of their being HIV-positive. In addition, virtually all of these teenage women were single. Married women of ages 30-39 were the most prevalent among the respondents.

Chi-square test of independence was conducted to determine the association between the uptake of cervical cancer screening and the independent variables of age, marital status, and number of children. The *p*-value < 0.05 suggested a significant statistical difference.

Respondents' Demographic Characteristics and Uptake of Cervical Cancer Screening

Chi-square test of independence was conducted to determine the association between the uptake of cervical cancer screening and the independent variables age, marital status, level of education and number of children. The *p*-value < 0.05 suggested a significant statistical difference. Table 2 presents the results of the analysis of each of these variables.

As shown in Table 2, the study identified that there is an association between women's age and uptake of cervical cancer screening. A cross-tabulation illustrated that women in the 30 to 39 age group had the highest uptake of cervical cancer screening while the lowest uptake was by those in the age group above 50 years 9 (9.3%). The results further indicate that fewer women above 50 years of age had undergone procedure. Therefore, there was an association between age group and uptake of cervical cancer screening.

The results also show that of all the women, 51% had cervical cancer screening done (*n*=97) and the rest of the group (49%) did not have the test done. The results of the Chi-square test were significant, χ^2 (4, N=190) = 1.930, *p* =.003) since *p* < 0.05. Further, there was a significant relationship between being married and uptake of screening with 42(43.3%) of married women having undertaken screening compared to widowed and divorced women with 7(7.2%) (*p*=0.032).

An analysis of the association between level of education and uptake of cervical cancer screening, however, showed a significant association, χ^2(5, N=190) = 5.359, *p*=0.001. The level of education was grouped into five categories; primary, secondary, certificate, diploma, university and masters. The results showed that women with diploma level of education had the highest rate of screening, 40(41.2%), while those with secondary level of education had the lowest uptake, 3(3.1%), (*p*=0.001).

DISCUSSION

The results of the study showed an association between cervical cancer screening and the demographic characteristics of age χ^2 (4, N=190) =1.930, *p*=0.003), marital status χ^2(4, N=190)=1.037, *p*=0.032), and level of education χ^2(5, =190) = 5.359, *p*=0.001) since *p* < 0.05. When examining

Table 2: Demographic Characteristics and Cervical Cancer Screening Uptake.

Variables	Ever been screened?		Df	χ²	P-Value
	Yes	No			
Age					
10-19yrs	10(10.3%)	6(6.5%)	4	1.930	
20-29	28(28.9%)	30(32.3%)			
30-39	34(35.1%)	30(32.3%)			*0.003
40-49	16(16.5%)	20(21.5%)			
above 50yrs	9(9.3%)	7(7.5%)			
Marital status					
Single	38(39.2%)	32(34.4%)	4	1.037	*0.032
Married	42(43.3%)	42(45.2%)			
Separated	3(3.1%)	3(3.2%)			
Widowed	7(7.2%)	10(10.8%)			
Divorced	7(7.2%)	6(6.5%)			
Level of education					
Certificate	26(26.8%)	32(34.4%)	5	5.359	*0.001
Diploma	40(41.2%)	26(28.0%)			
University	13(13.4%)	16(17.2%)			
Masters	8(8.2%)	10(10.8%)			
Primary	7(7.2%)	4(4.3%)			
Secondary	3(3.1%)	5(5.4%)			
Number of children					
1-2 children	13(13.6%)	43(46.2%)	2	6.938	
>3	84(86.4%)	50 (53.8 %)			0.741

Data shown are degree of freedom (Df), χ² Pearson's chi-square. (*) asterisk values are significant

the cervical cancer screening status of the participants, the results indicated a significant association and that majority of the women above the ages of 30 years were more likely to have had the screening compared to women who were in the lower age group. This finding was in agreement with a study done in Kenya on risks and barriers to cervical cancer screening among 219 women attending MCH-FP clinic at the Moi Teaching and Referral Hospital (MTRH). The MTRH study found that women over 30 years were more likely to have screened for cervical cancer than younger women.[12]

The proportion of married women accepting to go for screening was also high (43.3%) in this study, contributing to the reasonable number of women who go for screening. This was in agreement with the view by Rodvall *et al.* that females with spouses are more likely to participate in prevention activities because partners will take care of each other in ensuring that either receives the best medical care.[31]

In this study, women who had education above high school level (89.6%) were found to be more likely to test for cervical cancer because of better knowledge. Therefore, these women were more informed about the disease. In comparison, women with primary (7.2%) and secondary (3.1%) education had a low likelihood of being screened for cancer. This was consistent with the findings of Sabate and Feinsten that education increases the uptake of preventive care for several reasons, because better educated individuals have a higher efficiency in the production of health

and education as well imparts self-efficacy, confidence, motivation, patience and social inclusion, in search for health interventions.[32]

Majority of the respondents, 152(80%), had more than two children. This was attributed to the fact that majority of the women above the ages of 30 years were more likely to have had the screening and had more than 2 children. Almost all the participants were Christians (94.2%), and this was attributed by the fact that Christians were more geographically widespread in the region of study than were the Muslims.

CONCLUSION

In conclusion, the socio-demographic factors of age (p=0.003), marital status (p=0.032), and level of education (p=0.001) are significantly ($p < 0.05$) associated with the uptake of cervical cancer screening services. Meanwhile, number of children χ^2 (2, N=190) 6.938, p=0.741) are not significantly ($p > 0.05$) associated with the uptake of cervical cancer screening services. Majority of those attending care in Nandi County Referral Hospital CCC have a low uptake of CCSS with most of those who have taken the service being in the age bracket of 30-39 years and those with diploma and above education level.

RECOMMENDATIONS

Socio-demographic factors have been shown to influence uptake of cervical cancer screening. Therefore, based on the findings and conclusions of the study, the national government, through the Ministry of Health, should increase education on cervical cancer through seminars in the county health facilities and in the community. The government should also work with other interested parties to establish screening centres or integrate screening services with HIV/AIDS Comprehensive Care services. These will help many HIV/AIDS-positive women to increase their knowledge and understanding of cervical cancer and importance of regular screening.

CONFLICT OF INTEREST

The authors declare that there is no conflict of interest.

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