

Cervical Neoplasia Screening knowledge Among Women in Nairobi County, Kenya: An Evaluation of Awareness, Accessibility, and Program Effectiveness

BY

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Abstract

Cervical cancer remains a leading cause of cancer-related morbidity and mortality among women globally, with a particularly high burden in low- and middle-income countries. In Kenya, cervical cancer presents a critical public health challenge. Despite the fact that the rate of cervical malignant growth has been reduced significantly through screening and treatment of pre-cancer in resource-rich countries, application of same strategies in resource-limited countries has been found to be costly. Higher frequency and prevalence of cervical dysplasia and invasive cancer has been observed in HIV infected women of young age, who present with more advanced malignancies and have lower survival rates than HIV negative women. The study aimed to ascertain the factors affecting cervical neoplasia screening knowledge in Nairobi County, Kenya. This publication examines cervical neoplasia screening knowledge among women in Nairobi County, focusing on awareness levels, accessibility to screening services, and the effectiveness of current screening programs. The findings highlight significant gaps and barriers that need to be addressed to improve cervical cancer prevention and control.

Keywords: Prophylactic immunizations: it includes immunizations given to protect an individual from common diseases and infections.

CIN: Cervical Intraepithelial Neoplasia

INTRODUCTION

Cervical cancer is largely preventable through early detection and treatment of pre-cancerous lesions. Screening programs have been shown to significantly reduce cervical cancer incidence and mortality. In Nairobi County, Kenya, the effectiveness of these programs is crucial given the high incidence rates. This study explores the current state of cervical neoplasia screening, evaluating the knowledge and access among women, and assessing the impact of existing screening initiatives.

Cervical Dysplasia and HIV

Cervical malignant growth is brought about by HPV oncogenes type 16 as well as type 18 (Clifford et al., 2016), both of which are attributed to 70% of invasive cervical cancer cases (Odida et al., 2011; Ribeiro et al., 2015). Despite the high clearance of HPV infection between 6 months to 2 years (Ferlay et al., 2018; Moscicki, 2010), an increased risk of developing dysplasia of the cervix and ICC at higher levels has been observed in cases where -HPV has been persistently observed (Ribeiro et al., 2015). In 2015, it was reported

worldwide that an estimated 270,000 people died while 500,000 new cases of HPV-associated cancer of the cervix was observed (Torre et al., 2015). The vast majority of the burden worldwide estimated to be above 80% occurs within underdeveloped areas, accounting for about twelve percent of the women diagnosed with cancer. Before that, approximately 33.2 million individuals got HIV infected, with about 23 million of these residing in the sub-Saharan region of Africa, with women contributing to slightly over 60% of them. Women with HIV are bound to have cervical malignant growth and ICC than those without HIV (Abraham et al., 2013). An expanded risk of cervical carcinoma and a higher predominance of oncogenic HPV-type of diseases have been related with HIV-dependent immunosuppression (Firnhaber et al., 2010).

Infections caused by HPV are not only more frequent among women who are HIV- seropositive (Liu et al., 2018), but are bound to persist (Moscicki et al., 2010) and thus bring about a greater prevalence of high-grade cervical lesions (Kashyap et al., 2019) than among women who are HIV-seronegative. Conflicting data exists concerning the general importance of



the most broadly perceived HPV types in ICC among HIV-seronegative women (type 16) and among HIV-seropositive women (Tartaglia et al., 2017) and (Clifford et al., 2016). This information has significant ramifications for present accessible HPV prophylactic immunizations focusing on oncogenic HPV types 16 and 18 (Julia, and Dorotha, 2011). A worldwide survey of Types of HPV among HIV seropositive women showed an increase in the prevalence of cervical damage (Clifford et al., 2016). Whereas HIV-seropositive women have high-grade squamous intra-epithelial lesions (HSIL), it contrasted with HIV-seronegative women (Clifford et al., 2016).

In contrast, one case series from Kenya found a similar degree of HPV 16 positive among HIV seropositive (41%) than HIV-seronegative women (44%) with ICC (Menon et al., 2017). Among HIV-positive women in Europe and the U.S.A., the prevalence of HPV16 is weaker with decreased immunity (estimated to have decreased CD4 counts) compared to other types of HPV (MacLeod et al., 2011), indicating that HPV16 may be more resistant and in a good position to avoid responses to other HPV types. However, there are currently no data available on the link between HIV-induced stress and HPV16 infection in HIV-infected women in our African setup. With the worldwide increment in financing to encourage the treatment of more HIV-infected people in less developed nations, more women with HIV infection are currently getting to antiretroviral treatment.

Some previous examinations have proven there is a reduction in uterine sores in HIV-infected women, with special antiretroviral therapy (HAART) (Adler et al., 2010); in any case, there is no indication for differences between women who are not treated or who are treated with different antiretroviral regimens (Kim et al., 2013). One investigation showed that treatment with HAART did not completely affect the tolerance of oncogenic HPV (Mario et al., 2017), and cervical HPV infection continues to rise in patients with HAART (Vaccarella et al., 2013). Although HAART clearly affects the immune response in individuals infected with HIV, the impact of ART on uterine neoplasia remains controversial. Women infected with HIV are vulnerable to contracting human papillomavirus (HPV) in comparison with women who are not infected (Clifford et al., 2016; Abraham et al., 2013). Although numerous HPV diseases are commonly found in women infected with HIV, it isn't evident whether certain HPV types tend to group in multiple infections past or underneath what might be normal by shared risk factors, e.g., sexual conduct and the level of immunosuppression. This could be pertinent for the assessment of the impact of HPV prophylactic immunizations.

The elimination of certain HPV types through vaccination could, in principle, in a way increase or diminish the prevalence of other untargeted types. Past studies among HIV-negative women (Vaccarella et al., 2010; Chaturvedi et al., 2011; Vaccarella et al., 2011; Carozzi et al., 2012; Vaccarella et al., 2013) and men (Vaccarella et al., 2013) have revealed a general propensity of HPV types to group or cluster in multiple infections. In any case, there has been not a single

proof for explicit HPV types to be found together regularly than anticipated by chance with different types. Significant over abundance of a couple of HPV type combinations have been seen, yet they have been shown to derive from analytical artefacts, e.g., cross-hybridization of intently homologous HPV types utilizing chemical immunoassay for genotyping (Vaccarella et al., 2011) or specialized constraints of the HPV discovery techniques utilized, e.g., circuitous proportion of HPV 52 by utilizing a blended test utilizing Roche Linear Array (Vaccarella et al., 2010). Until this point in time, the clusterring examples of various HPV associated infections in women living with HIV have been assessed in just one study situated in the USA (Chaturvedi et al., 2011).

HPV infections ordinarily clear in 6 months to two years in 70% of females among immunocompetent subjects. Nonetheless, women that have HIV infection have a higher pervasiveness of HPV disease and tend to acquire persistent HPV infection with numerous HPV types and along these lines are at more serious risk of acquiring cervical intraepithelial neoplasms. Dysplasia has been accounted for in 15 to 64.6% of HIV-infected women and these percentages appear 10-12 times higher compared to the ones seen in women who are not infected with HIV. The degree of information and awareness needs to increase in the majority of women who are ignorant in our general public. On account of their inherent biological vulnerability, cytological screening is a powerful tool in forestalling cervical malignancy in that larger part of disease cases are preceded by a long-standing dormant period. Pap smear is the standard screening apparatus to recognize abnormal cells that could get malignant.

Invasive Cervical Cancer (ICC)

In the year 1993, invasive carcinoma of the cervix (ICC) was incorporated as one of the diseases associated with HIV/AIDS. Similar to HIV-negative women, the types of oncogenes responsible for HPV play a very important part in the interaction of HIV and the uterus. Information from data obtained from Africa demonstrates that in the absence of high-risk HPV, susceptibility of HIV infected women to ICC compared to HIV uninfected is around 1 (Lui et al., 2018; Clifford et al., 2016; Clifford et al., 2017). In a study conducted for ICC in Kenya, HIV + patients had an increased risk of acquiring HPV compared to HIV-infected patients. About 50% of 16 or 18-related illnesses had several types of HPV (Chan et al., 2019). A study found in the AIDS library and on growing malignant reports in 15 American countries showed that people suffering from AIDS (data captured 4-60 months after an AIDS diagnosis) actually increased the risk of ICC relative to population (SIR).) At 68.6, 95% CI = 59.7 to 78.4 (Abraham et al., 2013; Sasco et al., 2010). At the launch of Post-HART (1996-2004), ICC did not increase particularly among women having lower CD4 T-cell counts, suggesting increase in screening but did not show evidence of decreased HAART access. There is no evidence of an increasing number of ICCs on standard testing or control of abnormal Pap smears (Anderson et al., 2012; Nahvizou et al., 2016). Evidence from case studies or research conducted in

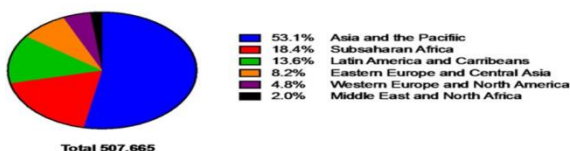
Senegal, Tanzania, Republic of South Africa, and Kenya shows that ICC is related to HIV infection in various countries in Africa (Kashyap et al., 2019).

In any case, there have been conflicting results from studies conducted to look at the connection between cervical malignant growth and HIV in African women, mirroring the danger of death from other HIV-associated situations or different diseases (Adjorilo-Johnson et al., 2010; Ononogbu et al., 2013). Scientific estimates of the statistic assumed that, in comparison to non-ART and untested, the health associated with the risk of death from the ICC was repeated with ART and no testing; however, tests performed once, may lower the mortality of ICC (Atashili et al., 2011). Invasive cervical cancer is more common in women at a very young age and with a lower state of immunosuppression in comparison to women who are HIV-positive or having other AIDS-specific conditions. Women diagnosed with HIV (especially those with CD4 <200 / mm³), and with invasive carcinoma of the cervix may have metastatic stages (e.g. high recurrence and mortality rate, shorter mortality) (von Bogart, 2011).

HIV Prevalence by Region 2012
Data from UNAIDS



Cervical Cancer Incidence by Region 2012
Data from GLOBOCAN 2012



Nature of Cervical Dysplasia by Histology

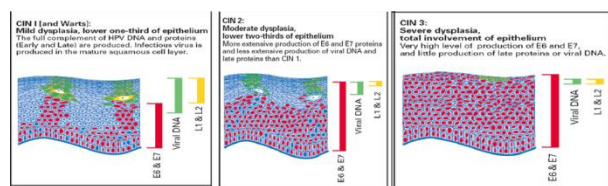


Figure 2. 2: Mild, Moderate, and Severe dysplasia of the Epithelium (Smear)

Cervical malignant growth is fundamentally the most typical gynaecological female cancer in less developed, low-educated, and lower-developed nations (Bosch et al 2013). Cervical cancer is the major reason for cancer mortality in women living in these lower economic regions (Jemal et al; 2012) out of 85% of the total estimated 500,000 globally occurring cases of cancer annually (Globocan, 2012). Cervical dysplasia as the initial phase of cancer in the cervix can be cured upon early detections in its development stages. Cervical dysplasia as the underlying phase of cancer of the cervical region can be cured upon early identifications in its advancement stages. There is international recognition for the ongoing transmission of certain HPV strains classified as

genotype 16, 18, 31, 33, 35, 39, 45, 51, 52, 56, 58, 59, and 68 regarded as high-risk and important for squamous intraepithelial neoplasia (CIN) (Thus et al., 2019; Trottier et al; 2009; Bouvard et al; 2009; Abreu et al., 2012).

Infectious lesions affecting the lower or upper extremities present with abnormal development of epithelial squamous cells seen in the cytology smear. CIN lesions of 1 to 3 indicate the size of undesirable cells found in the cervix region. The prevalence of cervical injury and mortality rate has declined sharply in many countries with high socioeconomic status over the past four decades as a result of regular examination, solid treatment, and improved financial status (Denny et al., 2016). The HPV vaccine focuses on ICC-related HR strains that are approved for use in young people over nine years of age, and are widely used in the context of high socio-economic conditions. However, the incidence of ICC and mortality remains high at countries within the Lower socioeconomic bracket, where several testing services with HPV vaccination programs are available. In addition, access to ICC management services is compulsory as a result of insufficient trained personnel, surgical equipment, and radiation therapy (Jemal et al., 2012). The highest incidence of ICC and HIV prevalence has been seen within the Sub-Saharan region. ICC ranks among the most widely recognized neoplasms affecting women infected and living with HIV and is viewed as one of the most common and well-known HIV/AIDS-related sicknesses (Rubinstein et al., 2014). Opportunities for control, early detection, and prevention of HPV in WLHIV-related dysplasia of the cervix are present but these conditions seem suppressed and improperly diagnosed.

Methodology:

Cross-sectional design using a questionnaire was utilized to obtain data on knowledge, behavior, and perceptions with regard to cervical malignancy and on acceptability of cervical cancer screening.

Methods

A cross-sectional, descriptive, and quantitative study design using a questionnaire was utilized to obtain data on knowledge, behavior, and perceptions with regard to cervical malignancy and on acceptability of cervical cancer screening. This questionnaire was used to study knowledge, behaviors, and perceptions affecting the use of cervical cancer screening on respondents. Quantitative data was collected through a structured survey administered to a representative sample of women in Nairobi County. Qualitative data was obtained via in-depth interviews and focus groups with healthcare providers and women who have accessed screening services. Data analysis involved statistical evaluation of survey results and thematic analysis of qualitative data.

Results of the Study:

An analysis and discussion of research data is presented using frequency tables and charts. An attempt was made to define the results based on field data. All question papers were completed and returned for data analysis.

Factors affecting relationship between cervical screening and treatment of cervical cancer patients

This section provides the details of the respondents. This information is presented in a number of basic qualifications, including the age of the respondents, study period, gender, level, and method of study. This data gives an overall comprehension of the populace under examination. An investigation of these factors gives a setting in which some of the following variables fall.

Screening Status

The study found that majority of respondents 70.0% reported underscreening for cervical cancer, 18.0% reported regularly screening while 12.0% reported over-screening. The study found that most of respondents who reported underscreening were aged between 30-39 years, most of those regularly screened were those aged between 50-59 years of age while over screened cases were mainly aged between 20-29 years. Test of association between age groups and pap smear history revealed that age was fundamentally connected with screening history $\alpha=0.05$.

The study also reported that most of those under-screened and regularly screened came from major cities while those over-screened came from inner regions. The study however, found the association was not significant at $\alpha=0.05$. It was also found that more disadvantaged group in society tended to dominate high proportion of underscreened and overscreened. This was likely to have been influenced by free cancer screening for the year 2019. The association for the economic status, education attainment, marital status, status of children, and smoking behavior were found to have significant association with the Pap smear screening history of the respondents. The study also examined the association between abnormal Pap smear History and features of the respondents. The study assessed how age, locality, social economic status, education attainment, marital status, number of children, and smoking status of the respondents associated with abnormal pap smear history. **This finding is presented in table 4.4 below.**

Table 4: Pap smears History and Characteristics in a study Sample of 300a

Pap history with abnormalities						
	Yes		No b		X ² c	P d
	N (91)	% (30.4)	N (209)	% (69.6)		
Age in 10 yr groups					47.630	<0.00002
20–29	14	15.4	64	30.6		
30–39	32	35.2	49	23.4		
40–49	22	24.2	43	20.6		
50–59	18	19.7	29	13.9		
60–69	5	5.5	24	11.5		
Locality					4.02	0.16
remote,very remote	4	4.3	8	3.8		
outer regional	23	25.3	47	22.5		
inner regional	28	30.8	58	27.9		
major cities	36	39.6	96	45.8		
Socioeconomic status					5.83	0.47
quintile 1 (most disadv e)	16	17.7	40	19.0		
quintile 2	19	20.7	40	19.0		
quintile 3	16	17.5	30	14.5		
quintile 4	16	18.0	38	18.3		
quintile 5 (least disadv)	24	26.1	61	29.2		
Educational attainment					8.01	0.03

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Yr 10 or below	19	21.1	35	16.7		
Yr 11 or 12	16	17.7	43	20.6		
cert or diploma e	40	43.5	77	36.8		
Ba degree or higher e	16	17.7	54	25.9		
Marital status					18.7	<0.0002
never married	8	9.1	40	19.2		
married	55	60.2	117	56.0		
defacto	17	18.2	28	13.5		
sep/div/wid e	11	12.5	24	11.3		
Had children					16.18	<0.0003
no	15	16.6	61	29.1		
yes	76	83.4	148	70.9		
Smoking status					3.95	0.05
yes	24	26.4	44	21.0		
no	67	73.6	165	79.0		

History of Pap smears Abnormalities

Approximately 30.4 % of women with history of Pap smear reported an abnormal test while 69.6% reported normal test. The study tested if the outcome of Pap smear test had a significant association with the respondents’ features. The study found the Pap smear outcome was significantly associated with age, educational level of attainment, marital status, bearing of children, and smoking status of the individual at $\alpha=0.05$. Consequently, the study found locality and economic status did not significantly associate with the Pap smear outcome.

Cervical Cancer/Screening Knowledge

The study also tested level of knowledge among the interviewed women in Kenya. The study sought the respondents understanding on the National Cancer Screening Guidelines and the implication of Pap smear findings and associated cancer risk factors. **The findings were presented in table 4.5.**

Table 4. 5: Cervical Screening Knowledge among the respondents (n=300)

Cervical Screening Knowledge assemmment	N=300	%
What is pap smear used to test		
A test to search for irregular cells (correct response)	214	71.3
Cancer treatmentr	49	16.3
Test of STIs	19	6.3
Other	8	2.7
Examine of women health	5	1.7
HPV	2	0.7

Don't know/did't answer	3	1.0
Respondents understanding of pap smear meaning		
Abnormal, precancerous cells (correct answer)	146	48.7
Cancer	86	28.7
Follow-up/further investigation/tests needed/Something wrong	50	16.7
Infection	24	8.0
Other	19	6.3
Don't know/didn't respond	33	11.0
Perceived frequency of pap smear test among respondents		
Annually	65	21.7
Bi-annually (correct response)	214	71.3
3–5 years	6	2.0
No specific timeframe	11	3.7
Don't know	4	1.3
Perceived recommended age to start pap smear		
Below 18	23	7.7
Between 16–20 years (correct response)	50	16.7
Between 21–25 years	14	4.7
Over 26 years	17	5.7

Immediately they become sexually active	178	59.3
Other	10	3.3
Don't know/didn't want to answer	8	2.7
Perceived recommended age to stop having Pap smears		
No exact time	98	32.7
Should not stop	68	22.7
70 years and over of age (correct response)	32	10.7
At menopause	21	7.0
Once a woman has become sexually inactive	8	2.7
After hysterectomy	4	1.3
Other	14	4.7
Don't know/didn't answer	55	18.3

Cervical Screening Knowledge

The study examined the participants' knowledge on cervical cancer that varied with moderate to high. The study assessed the respondents' knowledge on the purpose of Pap smear, meaning, perceived frequency of use, recommend age at which one should start and/or stop Pap smear. The study found majority of the respondents were aware of the purpose of Pap smear as implied by 71.3% who reported that it is used to detect abnormal cells. It was also found that most respondents understood the meaning of pap smears as 48.7% reported that Pap smear was the detection of Abnormal, precancerous cells, 71.3% correctly identified the recommend frequency at which Pap smear should be undertaken by women (bi-annually). A significant proportion also said that Pap smear was recommended every year.

The study further noted that only 16.7% knew the right age (which is 16-20 years) when one should start pap smear, on contrary, 59.3% reported that one should start pap smear immediately the becomes sexually active. On the examination of the perceived recommended age to stop having Pap smears, the respondents gave varied response with highest proportion 32.7% who said that there was no exact time at which one should stop pap smear, 22.7% said that one should not stop. However, 10.7% who correctly reported on this question said that one should stop Pap smear at age of 70 years of age and above.

Awareness:

The study found that awareness about cervical neoplasia and the importance of screening was relatively low among the participants. Approximately 45% of women were aware of cervical cancer, but only 30% knew about screening methods and their availability.

Accessibility:

Accessibility to screening services varied widely. While some women had easy access to clinics offering cervical screening, others faced significant barriers, including high costs,

transportation issues, and lack of nearby facilities. Only 25% of women reported having undergone cervical screening in the past five years.

Program Effectiveness:

Existing screening programs in Nairobi County demonstrated limited reach and impact. While some initiatives successfully offered screening services and follow-up care, many women did not participate due to logistical challenges and insufficient outreach.

Discussion:

The findings underscore critical gaps in cervical neoplasia screening knowledge in Nairobi County. The low level of awareness highlights the need for more effective educational campaigns. Accessibility issues point to the necessity for expanding screening facilities and subsidizing costs to make services more reachable. The limited effectiveness of current programs suggests a need for stronger implementation strategies, including improved outreach and follow-up mechanisms.

Recommendations:

- 1. Enhance Awareness Campaigns:**
Develop targeted educational programs to increase knowledge about cervical cancer and the benefits of screening, focusing on underserved populations.
- 2. Improve Accessibility:**
Increase the number of screening facilities and offer mobile screening units to reach remote areas. Address financial barriers through subsidized or free screening programs.
- 3. Strengthen Program Implementation :**
Implement robust tracking and follow-up systems to ensure that women who receive initial screening are monitored and treated appropriately.
- 4. Policy Advocacy:**
Advocate for policies that support comprehensive cervical cancer prevention programs, including funding for education, screening, and treatment services.

Conclusion:

Cervical neoplasia screening knowledge in Nairobi County faces several challenges that impact its effectiveness. Addressing issues of awareness, accessibility, and program implementation is crucial for improving screening rates and ultimately reducing cervical cancer incidence and mortality. Enhanced public health strategies and policy support are essential to advancing cervical cancer prevention efforts in the region.

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