Factors Influencing the Uptake of Cervical Cancer Screening among Female Doctors and Nurses in Kenyatta National Hospital

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Authors' contributions

This work was carried out in collaboration among all authors. Author MMK conceived the study, collected data and wrote the first draft of the manuscript. All authors contributed to the study design, data analysis and interpretation of the findings. All the authors read and approved the manuscript.

Original Research Article

ABSTRACT

Aims: The aim of the study was to assess factors influencing the uptake of cervical cancer screening among female doctors and nurses in Kenyatta National Hospital (KNH) in Kenya. To achieve this cross-sectional study was conducted in KNH between January 2019 and April 2020.
Methodology: Stratified random sampling method was used to select 271 nurses and 39 doctors from a population of 1400 nurses and 301 doctors. Data was collected through a structured close ended questionnaire. Chi-square test of homogeneity was used to determine the association between cancer screening uptake and demographic factors. A multiple regression analysis was used to test the relationship between the determinants (factors) of uptake of cervical cancer screening that included availability of procedures, cost of procedures, time, the attitude of HCW, awareness of procedures, religion, age, culture, multiple sexual partners.
Results: Findings revealed that 97.5% (n = 272) are aware of cervical screening with most of the participants (95.3%, n = 266) indicating that they have been screened for cervical cancer before.

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PAP tests and HPV DNA tests were noted to be the most used screening methods. The majority of the participants (14.7%, n = 41) indicate that the major benefit of the cancer screening programs is enhanced early detection/ treatment/care, followed by general awareness on cervical cancer (35, 12.5%). Findings further revealed that the health workers who have ever heard about the vaccine were reported to have higher uptake of cervical cancer screening (Chi=32.158, *p* = .05, n =262).
Conclusion: Our study identified that lack of adequate health infrastructure and resources is a well-recognized barrier to screening in Kenya.

1. INTRODUCTION

In the recent decade, cancer has grown in prevalence, to become among the leading causes of morbidity and mortality worldwide. In females, breast and cervical cancer are the commonest, with an increased incidence over the past number of years. The general effects of cancer in the world are projected to continue escalating, particularly in developing countries. It is projected that an estimated 15.5 million people will be diagnosed, and 12 million will die of cancer in the year 2030 [1]. According to Kenya Cancer Statistics & National Strategies, cancer causes more deaths than TB, HIV and Malaria combined. It is essential to note that 71% of the world's cancer burden is in low and middle-income countries. In Kenya, it is estimated that there are about 40,000 new cases of cancer each year with more than 30,000 deaths per year. Cervical cancer is among leading cancer among women globally [2], while cancer mortality has dropped in high-income countries with better-quality screening and treatment services, the incidence of cervical cancer is expected to increase in low and middle-income countries as their populations grow [3]. About 600,000 women are diagnosed with cervical cancer leading to around 280,000 deaths, across the world every year [4]. And regardless of prognosis, the effect of cervical cancer is far bigger than the number of cases would suggest because the primary diagnosis of cervical cancer is seen as a life-threatening event, with over a third of patients undergoing clinical anxiety and depression. Cervical cancer is also stressful for the family affecting both the family's daily functioning and economic situation.

Early detection of cancer significantly increases the chances of successful treatment. There are two major aspects of prompt cancer detection: health education to intensify awareness and screening. According to the regional cancer registry at KEMRI, about 80% of reported cases of cervical cancer are identified at very advanced phases when very little can be accomplished in terms of curative treatment because there is; low uptake of cervical cancer screening, a lack of cervical cancer awareness among the population at risk, limited access to health care services, lack of familiarity with the concept of preventive health care, fear of pain during the screening or of the test results and HIV infections [5].

Those in the public Healthcare sector especially female healthcare workers have a big role to play in educating the public about the importance of frequent screening and screening procedures. These female health workers are expected to act as role models to the public but most have poor knowledge of risk factors for breast cancer and the practice of breast cancer screening increasing the urgency for regular update courses for health workers concerning cervical cancer education including screening methods.

2. METHODOLOGY

The study was carried out at the Kenyatta National Hospital in Nairobi County. It is the oldest and the largest public national referral hospital in Kenya and East and Central Africa and has 2000 beds, 50 wards, and 22 outpatient clinics. Respondents were stratified as nurses and doctors then simple random sampling was used to select 271 nurses and 39 doctors. Cross-sectional study design was used.

Questionnaires consisting of both structured and non-structured questions were used to collect data for the study. The questionnaire was made up of two sections: section I having the general information on the respondents. Section II comprised questions on the prevalence of cervical cancer and factors influencing the uptake of cervical cancer screening among female doctors and nurses. A five-point Likert scale was designed to measure responses that ranged from 1 – 5. These responses were; strongly disagree = 1, somewhat disagree = 2, disagree = 3, agree = 4, somewhat agree = 5,

and strongly agree = 6. The questionnaires comprised information on the prevalence of cancer and factors for the uptake of cervical cancer screening. The respondents were guided by the research assistants as they filled the questionnaire. The questionnaire was administered through drop and pick later method.

Data were entered into SPSS version 21 where data cleaning, coding, and allocation of valueswere done. Chi-square test of homogeneity was used to determine the association between cancer screening uptake and demographic factors. A multiple regression analysis was used to test the relationship between the determinants (factors) of uptake of cervical cancer screening that included availability of procedures, cost of procedures, time, the attitude of HCW, awareness of procedures, religion, age, culture, and multiple sexual partners.

The research data was collected, analyzed and reported honestly. There was objectivity in the selection of the design. Confidentiality was maintained throughout the study. Respondents' rights to privacy and autonomy were ensured through signing of the consent letter and instructions not to write their names in the questionnaire. Procedures of conducting the research as outlined by the National Commission for Science, Technology and Innovation (NACOSTI) such as permit clearance and authorization letter were adhered to.

3. RESULTS AND DISCUSSION

3.1 Prevalence of Cervical Cancer

Findings in Table 1 indicated that 97.5% (n = 272) of the respondents are aware of cervical screening with most of the participants (95.3%, n = 266) indicating that they have been screened for cervical cancer before. Of the two hundred and sixty- six who indicated that they have been screened for cervical cancer, 7.5% (n = 21) indicated that they used VIA-VILI method with 59.5% (n = 166) indicating either HPV-DNA test or Pap test. Respondents preferred the various methods of screening majorly due to: 31.5% (n = 88) easiness of administration, 17.9% (n = 50) accuracy, 6.8% (n = 19) cheapness and 43.7% (n = 122) other reasons. Nine of the VIA-VILI method was preferred due to its accuracy, HPV-DNA test or Pap test 26.2% (n= 73) preferred it because it is easy to administer. Table 1 further shows that 82.4% (n = 230) indicated that they had the screening is done in less than three (3) years ago, followed by 10.8% (n = 30) between 3 to 5 years and less than a tenth of the participants having screened more than five years ago.

Findings revealed that 63.8% (n = 178) sought the screening services from other facilities: Private/public and 36.2% (n = 101) having the screening done at KNH. 57% (n = 159) indicated that they are willing to have it done with 88.2% (n = 246) being aware that screening procedures are available at KNH. Of the participants, 53.8% (n=150) revealed that they know of other staff who have ever been screened at KNH.

3.2 Age of Cancer Screening

According to the findings, almost half of the participants (45.5%, n=127) indicated that women of between the ages of 13 to 20 are first invited for cervical cancer screening, followed by 22.6% (n = 63) over 21 years and 12.5% (n = 35) less than 13 years. Notably, 19.4% (n = 54) indicated that all the age categories indicated are fit for screening as shown in Fig. 1.

3.3 Factors Contributing to Uptake of Cervical Cancer

Table 2 shows factors that may affect the uptake of cervical cancer screening among female nurses and doctors in Kenyatta National Hospital. According to the findings, the mean responses for the availability of procedures were reported as Mean (SD) of 3.45 (1.526). This implies that the availability of procedures is a huge contributor to the uptake of cervical cancer screening. The cost of procedures was reported as Mean (SD) of 3.36 (1.564) which means that most of the participants feel that cost of procedures is a barrier to uptake of the screening sessions. The attitude of HCW was reported as 3.53 (1.510). This implied that even in the wake of stigma related to cancer of the cervix and its screening, females participated in the program. [6] Asserts that some women choose not to attend health facilities because of previous negative experience, concerns about privacy or confidentiality, cultural beliefs or traditions, or misinformation about the purpose and availability of services.

3.4 Relationship between Cancer Screening Uptake and Demographic Factors

Table 3 indicate that participants' age and cervical cancer uptake were reported to be

statistically significant (Chi = 12.464, *p* = .05, n = 279). Respondent marital status does not influence uptake of cervical cancer screening (Chi = 0.9759, *p* = .05, n = 279). In addition, participant year of service was reported as statistically not significant (Chi = 9.142, *p* = .05, n = 279). On establishing the test for significance between respondent cadre and uptake of

Table 1. Prevalence of cervical cancer

| Statement	Freq. (n)	Percent (%)
Are you aware of cervical cancer screening	272	97.5
Have you been screened for cervical cancer before?	266	95.3
If yes, which method did you use?		
• VIA-VILI	21	7.5
• Pap test	166	59.5
• HPV-DNA test	166	59.5
Why do you think the method above preferred?		
• Accuracy	50	17.9
• Easy to administer	88	31.5
• Cheaper	19	6.8
• Any other	122	43.7
When did you have it done?		
• < 3 years ago	230	82.4
• 3-5 year ago	30	10.8
• > 5years ago	19	6.8
Where was it done		
• KNH	101	36.2
• Other facility: Private/public	178	63.8
If not screened, would you be willing to have it done?	159	57.0
Do you know if any of these screening procedures are available at KNH?	246	88.2
Do you know of any other staff who have ever been screened at KNH?	150	53.8

*Field survey 2019
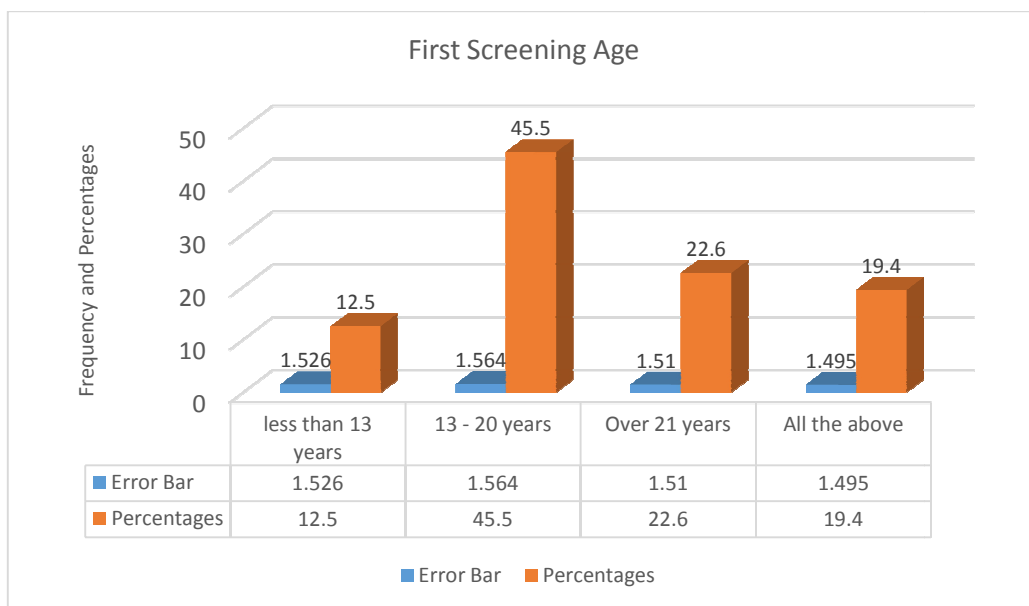
Fig. 1. First screening age

Table 2. Factors contributing to uptake of cervical cancer n = 279

Variables	Mean (x̄)	Std. Deviation (σ)
Availability of procedures	3.45	1.526
Cost of procedures	3.36	1.564
Attitude of HCW	3.53	1.510
Time	3.34	1.495
Awareness of procedures	3.42	1.600
Religion	3.29	1.413
Age	3.28	1.472
Culture	3.43	1.525
Multiple sexual partners	3.75	1.620

*Field survey 2019

Table 3. Association of cancer screening uptake and demographic factors

Characteristics	Have you been screened for cervical cancer before		Chi square	P value
	Yes	No		
Age (in years)				
Less than 30	49 (86%)	8(14.0%)	12.464	0.014
30 to 40	117 (80.1%)	29(19.9%)		
40 to 50	128 (92.1%)	11(7.9%)		
Over 50	43 (95.6%)	2(4.4%)		
Marital status				
Single	77(86.5%)	12(13.5%)	0.9759	0.807
Married	225(87.5%)	32(12.5%)		
Separated	16(80%)	4(20%)		
widowed	8(88.9%)	1(11.1%)		
Cadre				
Doctor	37(94.8%)	2(5.2%)	95.5364	0.0001
Nurse	200(83.3%)	100(16.7%)		
Years of service				
Below 5 years	78 (78.8%)	21(21.2%)	9.142	0.058
5-9 years	141 (88.1%)	19(11.9%)		
10-14 years	73 (92.4%)	6(7.6%)		
15-19years	27 (93.1%)	2(6.9%)		
20 years and above	16 (88.9%)	2(11.1%)		
Knowledge about cervical cancer screening				
Yes	207 (76.1%)	65 (23.9%)	156.91	0.0001
No	5(71.4%)	2(20.6%)		
Which method did you use?				
• VIA-VILI	21(100%)	-	10.599	0.001
• Pap test	164(98.8%)	2(1.2%)		
• HPV-DNA test	162(98.8%)	2(1.2%)		
Are you aware of cervical cancer screening				
• Yes	262 (96.3%)	10(3.7)	32.158	0.001
• No	4(66.7%)	2(33.3%)		

*Field survey 2019

cervical cancer, it was reported as statistically significant (Chi = 95.5364, *p* = 0.05). Knowledge about cervical cancer screening was found to be significant (Chi = 156.91, *p* = .05) as well as the method of screening that the respondent chose from the three key available options (Chi = 10.599, *p* = .05). Findings further revealed that the health workers who have ever heard about the vaccine were reported to have the higher uptake of the cervical cancer screening (Are you aware of cervical cancer screening (Chi = 32.158, *p* = .05).

3.5 Inferential Statistics

3.5.1 Multiple linear regression

Findings revealed that there exists a strong positive relationship between as shown by 0.916. R squared is 0.839 which implies that 83.9% of determinants of uptake of cervical cancer screening can be accounted to Availability of procedures, Cost of procedures, Time, Attitude of HCW, Awareness of procedures, Religion, Age, Culture, and Multiple sexual partners. Thus, it can be concluded that other determinants of uptake of cervical cancer screening contribute to 16.1%. The adjusted R squared is the coefficient of determination which tells us the variation in the dependent variable due to the alterations in the independent variables.

3.5.2 Regression coefficient results

Table 5 established the following regression equation:

$$Y=0.591+0.096X_1+0.08X_2+0.0.02X_3+0.011X_4+0.056X_5+0.08X_6+0.0.1X_7+0.03X_8+0.05X_9+\varepsilon.$$

Age was the factor with the strongest influence on uptake of cervical cancer screening (β = .216)

followed by availability procedures (β = .210). The factor with the least influence was time (β = .004) though this was not significant (*p > .001*).

3.6 Discussion

Past screening showed the level of awareness of cervical cancer screening among participants. This is in line with [7,8] assertion that in Kenya there is an endorsed screening cycle every 5 years for certain categories of the population such as HIV positive females. Similarly, as [9] opines, in developed countries, the cervical cancer screening cycle is shorter owing to the resources they have. It is critical to mention that lack of community awareness has been noted to be a challenge in increasing access to and improving the quality of cervical cancer screening services in Kenya [5,10].

The methods used for screening for cervical cancer included the use of VIA-VILI method, HPV-DNA test and the Pap test. Literature indicates that training directed at the Moi Teaching and Referral Hospital exposed a positivity rate of cancer cases diagnosed through VIA and VILI among females attending the family planning clinic [11,12]. Divergent views showed the varied ages of the female gender that turned

Table 4. Multiple linear regression

Model Summary			
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.916[a]	.839	.834	.28603

a. Predictors: (Constant), Multiple sexual partners, Availability of procedures, Culture, Awareness of procedures, Religion, Cost of procedures, Attitude of HCW, Time, Age
b. Dependent Variable: Level of uptake of cervical cancer

*Field survey 2019

Table 5. Regression coefficient results n = 272

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
1 (Constant)	.591	.051		11.617	.000
Availability of procedures (X_1)	.096	.025	.210	3.926	.000
Cost of procedures (X_2)	.080	.021	.179	3.776	.000
Time (X_3)	.002	.024	.004	0.071	.944
Attitude of HCW (X_4)	.011	.023	.023	0.480	.632
Awareness of procedures (X_5)	.056	.019	.127	2.958	.003
Religion (X_6)	.079	.024	.158	3.258	.001
Age (X_7)	.103	.024	.216	4.269	.000
Culture (X_8)	.031	.020	.067	1.569	.118
Multiple sexual partners (X_9)	.051	.015	.118	3.524	.000

a. Dependent Variable: Level of uptake

*Field survey 2019

up for the screening. More importantly, the 13 - 20 age category was the first to be invited followed by the over 21 age categories and lastly below 13 years. [13] Indicates that, the suggested target ages and incidence of cervical cancer screening depends on several predisposing factors. For example, high risk to HPV is most common among women under 25 years of age and considering the long progression time to cervical cancer if a woman can be screened once in her lifetime, then the best age is between 30-35 years [12].

Amongst the factors contributing to the uptake of cervical cancer is the availability of procedures, cost, and attitude of HCW. The issue of attitude is in line with [14,15] which asserted that some women choose not to attend health facilities because of a previous negative and concerns about privacy or confidentiality. Other factors included the participants' age. Though marital status did not influence uptake of cervical cancer screening, studies that explored cultural practices showed that cultural gender roles and behaviors of women may also influence the uptake of cervical cancer screening [16,17,18,10]. Knowledge about cervical cancer screening was found to be a significant factor. Several qualitative studies have shown that, women's illiteracy, perceptions, and inadequate knowledge about the importance of cervical cancer screening influence the uptake of cervical cancer screening [19,20].

4. CONCLUSIONS

Female healthcare providers play the major role in giving confidence and advice since they are the first persons in contact with the patients, they need to undergo cervical cancer screening more often. These cervical cancer screening procedures are available in Kenyatta National Hospital where the study was undertaken. Respondents were aware that screening procedures were available at KNH. Most of the respondents indicated that they were aware of screening with most indicating that they have been screened for cervical cancer before. The preferred methods were majorly due to easy administration, accuracy, and cheap in that order.

CONSENT AND ETHICAL APPROVAL

The proposal was presented to the Kenyatta National Hospital Ethics Committee and ethical clearance was obtained. After obtaining the ethical clearance, an application seeking permission to carry out a research was done to National Commission for Science Technology and Innovation and when a permit was granted, I paid a courtesy call to the Kenyatta National Hospital. The introductory letter was provided to the director of medical services at the Kenyatta National Hospital. Approval from the administrator was given. With the ascent of the administrator, consent was obtained from the individual respondents by the research assistants under the supervision of the researcher. Only those doctors and nurses who consented to participate took part in the study. The respondents' personal identification information was not recorded for purposes of confidentiality and anonymity.

COMPETING INTERESTS

Authors have declared that no competing interests exist.

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