Original Research Article

Socioeconomic status and health awareness predictors of cervical cancer screening uptake among women aged 25-49 years in Kiambu sub-county, Kenya

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ABSTRACT

Background: Cervical cancer is a major public health concern in Kenya, accounting for 12% of all cancer cases and being the leading cause of cancer-related deaths. This study aimed to identify the socioeconomic status and health awareness determinants of cervical cancer screening uptake among women aged 25-49 years in Kiambu town sub-county, Kiambu County, Kenya.
Methods: A descriptive cross-sectional design was used in this study, where both qualitative and quantitative data were obtained for purposes of triangulation. Multi-stage sampling technique was utilized to select study participants. Both chi-square and binary logistic regression were used to identify socioeconomic status and health awareness determinants associated with cervical cancer screening uptake. SPSS version 29 was used in quantitative data analysis. The cutoff for statistical significance was $p \leq 0.05$. Qualitative data were analyzed thematically.
Results: Cervical cancer screening uptake was at 40.2%. Earning between Ksh 20,001-30,000 (OR=5.4, 95% CI; 2.074-6.464, p<0.001), being married (OR=1.8,95% CI; 1.343-9.790, p=0.03), awareness of cervical cancer (OR=2.4, 95% CI; 1.342-4.122, p=0.003), and awareness of signs and symptoms (OR=1.5, 95% CI; 1.154-2.704, p=0.01) increased the odds of cervical cancer screening. Conversely, younger women aged 25-29 years (OR=0.22, 95% CI; 0.243-0.846, p=0.023) had reduced odds of cervical cancer screening uptake.
Conclusions: The uptake of cervical cancer screening was low among women aged 25-49 years in Kiambu sub-county. Awareness of cervical cancer signs and symptoms, awareness of cervical cancer, study respondents' age, marital status income were socioeconomic status and health awareness predictors of cervical cancer screening. Efforts should be put in place to enhance awareness of cervical cancer.

Keywords: Cervical cancer, Cervical screenings, Health awareness, Uptake

INTRODUCTION

Cervical cancer ranks fourth among all cancers in women; in 2020, there were an estimated 604,000 new cases diagnosed and 342,000 deaths from the disease.[1] According to reports, over 90% of all novel infections and deaths globally in 2020 happened in countries with middle or low incomes.[2] Although cervical cancer is the fourth most diagnosed cancer among women worldwide, over 85% of both cases and deaths occur in low- and middle-income countries, many of which are in Africa.[3]

The World Health Organization (WHO) projects an increase in cases of cervical carcinoma from 570,000 to 700,000 annually and an increase in deaths from 311,000 to 400,000 annually.[4] Cancer of the cervical cavity is the most common cause of death for African women (21.7%), and SSA is said to be responsible for 15% of all

female deaths from cancer.[5] Younger women are more frequently impacted by cancer of the cervical cavity, which accounts for 20% of cases of child-mother loss.[6] The three main methods of screening for cancer of the cervical cavity are molecular (HPV DNA testing), visual (visual inspection with acetic acid), and cytology-based (PAP smear and liquid-based cytology).[7]

Cervical cancer is a major public health threat in Africa, accounting for approximately 22% of all female cancers and causing 12% of new cancer cases in both men and women annually. The estimated incidence is 34 per 100,000 women, with a mortality rate of 23 per 100,000 women, compared to just 7 and 3 per 100,000, respectively, in North America.[8] In 2020, low- and middle-income countries accounted for more than 90% of new infections and fatalities globally.[9] Sub-Saharan Africa had the highest age-standardized morbidity and mortality rates in 2018, indicating that the disease disproportionately impacts low- and middle-income countries there.[10]

The burden of cervical cancer is increased by this lack of access to essential preventative treatments. If nothing changes, it is predicted that there will be 443,000 CC deaths worldwide by 2030, with 90% of those fatalities taking place in sub-Saharan Africa.[10] A thorough review and meta-analysis carried out in Sub-Saharan Africa revealed that 12.87% of women had been screened for cervical cancer.[11] The findings of their study indicated that women from a wealthy background, who had been sensitized by health workers about cervical cancer and with high knowledge about cervical cancer screening, had higher odds of having ever screened compared with their counterparts.[12]

With cancer of the cervix currently making up 12% of all cancer cases, it is the leading cause of death in Kenya. According to a study carried out in Kiambu County, one of the regions with a high occurrence of cancer of the cervix is Kiambu County.[13] Cancer of the cervix remains one of the leading causes of death in Kenya, where it is noted that 16.8 million women are at risk of developing cancer.[14] Despite the accessibility of services for screening, the incidence of cervical cancer screenings among women in Kiambu town sub-county, Kiambu County, Kenya, is low. To improve cervical cancer prevention efforts, it is vital to understand the factors impacting this population's screening behavior. Therefore, this study aimed to assess sociodemographic and accessibility predictors of cervical cancer screening uptake among women aged 25-49 years in Kiambu Town, Kiambu County, Kenya

METHODS

Study design

The study used a descriptive cross-sectional study design to identify the socioeconomic status and health awareness predictors influencing the utilization of cancer screening services among women aged 25-49 years in Kiambu town sub-county, Kiambu County, Kenya. Additionally, the design determined how many women in the Kiambu Town sub-county between the ages of 25 and 49 years had utilized cervical cancer screening services. The approach of the research was considered effective since it assessed the association between independent factors and the utilization of cervical cancer of the cervix screening services. For triangulation purposes, both qualitative and quantitative data were obtained in this study.

Study area

Kiambu County was formerly part of Kenya's central province. Kiambu serves as its capital, and Thika town is the biggest town there. After Nairobi County, Kiambu County has the second-highest population in Kenya. As of the 2019 census, the county's population is 2,417,735 residents overall, consisting of 1,187,146 men and 1,230,454 women.[15] The country's population density is 952 persons/km^2, meaning that there are 796,241 family units with an average size of three people.[16] The study took place in Kiambu Town sub-county, Kiambu County. With an area of 189.1 km^2, the sub-county is home to about 145,903 people. There are roughly 55,755 households overall, divided into 17 sublocations.

Study population

The study population is a subset of the target population and refers to the group of individuals who are available to participate in the study. It is the group from which the sample is drawn. In this study, the study population in this study was women aged 25-49 years residing in Kiambu town sub-county, Kiambu County, Kenya.

Sample size determination

Using the Fischer formula 1998 to determine the sample size for quantitative data, which was 249 participants, 246 study participants were enlisted for this investigation. The study was conducted in August 2024.

Sampling technique

The study adopted multi-stage sampling to select the respondents and the location of the study. Firstly, purposive sampling was applied to choose Kiambu County because the county has one of the counties with the highest cases of cervical cancer.[17] Secondly, the researcher employed simple random sampling to choose the Kiambu town sub-county out of twelve in Kiambu County. Kiambu town sub-county was clustered into four wards. Two stage clustering was adopted to get respondents proportionately from the clusters. Simple random sampling was adopted to select households with desired study respondents. If the randomly chosen household didn't have a woman aged 25-49 years, another household was chosen randomly.

Data collection tools and procedures

Both quantitative and qualitative data collection methods were employed, where semi-structured research-administered questionnaires were used to capture quantitative data, while Key informant guides and focused group guides were utilized for gathering qualitative data. A semi-structured questionnaire was used to collect quantitative data. Section A of the data collection tool captured data on the utilization of cervical cancer screening services, section B captured data on social demographic factors, and section C captured data on health awareness factors. Key informant interviews were carried out using a key informant guide. Focused group discussions were conducted using a focused group guide with the researcher being the moderator. Each focused group had 8-12 members, and the focused group discussions were guided by the point of saturation.

Statistical analysis

Quantitative data was cleaned to eliminate anomalies, outliers, extreme values, and matched. Cleaned data was imported from Excel into SPSS version 29 for analysis. In the descriptive analysis, percentages and frequencies were utilized. To examine the association between the uptake of cancer of the cervix screening services at a 95% confidence interval, a chi-square test was carried out. Variables with a p value of less than or equal to 0.05 were considered significant. To account for confounding effects and identify additional associations, objectively significant variables as determined by chi-square tests were keyed into a binary logistic regression model at a 95% confidence interval. Thematic content analysis was employed in the analysis of qualitative data.

Ethical consideration

The research complied with ethical standards and obtained approval from the Jomo Kenyatta University of Agriculture and Technology Ethical Review Committee (JKU/ISERC/02317/1358) and a research license from the National Commission for Science, Technology, and Innovation (NACOSTI/P/24/38276). An informed written consent form was obtained from the study respondents before data collection. Participants' privacy and confidentiality were highly respected, where unique codes were used instead of participant names. Data of the study participants was anonymized, while the data was securely stored to prevent access by unauthorized personnel.

RESULTS

Uptake of cervical cancer screening

More than a third (n=99, 40.2%) of the study respondents had been screened for cervical cancer. The majority (n=71, 71.7%) of the study participants had been screened only once. Concerning where cervical cancer screening services were obtained, more than half (n=62, 62.6%) of the study respondents reported obtaining cervical cancer screening services from a public health facility (Table 1).

Participants socio-demographic characteristics

Table 2 below provides descriptive statistics on sociodemographic factors of the study participants. Close to a quarter (n=75, 30.5%) of the study respondents were aged 35-39 years, while only a few (n=22, 8.9%) of the respondents were aged 45-49 years. Close to half (n=117, 47.6%) of the study respondents had obtained a secondary level of education. More than half (n=142, 57.7%) of the study respondents were married. The majority (n=227, 92.3%) of the study respondents reported the absence of cervical cancer history. Regarding the religion of the study participants, all (n=246, 100%) of the study respondents were Christians. More than a quarter (n=103, 41.9%) of the study respondents were earning less than 10,000 Kenyan shillings. Regarding the parity status of the study respondents, the majority (n=206, 83.7%) of the study participants had a multiparous parity status.

Table 1: Uptake of cervical cancer screening.

Variables	Categories	N	%
Cervical cancer screening	Screened	99	40.2
	Never screened	147	59.8
Screening frequency	Screed once	71	71.7
	Screened twice	16	16.2
	Screened thrice	12	12.1
Place where cervical cancer screening services were obtained	Public health facility	62	62.6
	Private clinic	20	20.2
	Mobile clinic	14	14.1
	Community health centers	3	3

Table 2: Descriptive statistics sociodemographic factors.

Variables	Categories	N	%	Mean	STD
Age (years)	25-29	47	19.1	36.8	6.13
	30-34	37			
	35-39	75	30.5		
	40-44	65	26.4		
	45-49	22	8.9		
Education level	College/university	55	22.4		
	Vocational	24	9.8		
	Secondary	117	47.6		
	Primary	47	19.1		
	No formal education	3	1.2		
Marital status	Married	142	57.7		
	Divorced	12	4.9		
	Single	69	28		
	Widowed	11	4.5		
	Separated	12	4.9		
Cervical cancer history	Yes	19	7.7		
	No	227	92.3		
Income level	>30000 Ksh	22	8.9		
	20001-30000 Ksh	43	17.5		
	10001-20000 Ksh	78	31.7		
	<10000 Ksh	103	41.9		
Parity status	Multiparous	206	83.7		
	Primiparous	34	13.8		
	Nulliparous	6	2.4		
Religion	Christians	246	100		

Sociodemographic factors associated with the uptake of cervical cancer screening

Regarding the sociodemographic factors associated with the uptake of cervical cancer screening, the following variables were imported for binary logistic regression analysis because they showed a significant statistical correlation when the bivariate analysis was done. Study participants' age (χ^2=9.449, df=4, p=0.05), education level (χ^2=12.33, df=4, p*=0.01), marital status (χ^2=10.067, df=4, p=0.04), parity status (χ^2=9.314, df=2, p*=0.009) and income level (χ^2=28.400, df=3p<0.001). Cervical cancer screening was not statistically correlated with having a cervical cancer history (χ^2=2.668, df=1, p=0.102).

As indicated in Table 3, study participants aged 25-29 were 78% less likely to seek cervical cancer screening services as compared to those aged 45-49 years (OR=0.22, 95% CI; 0.243-0.846, p=0.023). In addition, study respondents earning 20001-30000 Ksh were 5.4 times more likely to seek cervical cancer screening services as compared to those earning below 10000 Ksh (OR=5.4, 95% CI; 2.074-6.464, p<0.001). Furthermore, Study respondents who were married were 1.8 times more likely to seek cervical cancer screening services as compared to those who were separated (OR=1.8, 95% CI; 1.343-9.790, p=0.03).

These findings were consistent with the qualitative findings where one of the focused group discussants noted that:

"….*Let me say this, in my society, we married women tend to have more frequent interactions with healthcare services, particularly during pregnancy and family planning. These visits provide more opportunities for healthcare providers to recommend cervical cancer screenings such as Pap smears…*" (participant 5, age 34, FGD 4,2024).

Health Awareness factors associated with uptake of cervical cancer screening

Regarding the accessibility factors influencing the uptake of cervical cancer screening, the following variables were imported for binary logistic regression analysis because they showed a significant statistical correlation when the bivariate analysis was done: Awareness of cervical cancer signs and symptoms (χ^2=8.693, df=2, p=0.01). cervical cancer awareness (χ^2=10.018, df=1, p=0.002) and awareness of cervical cancer signs and symptoms (χ^2=8.693, df=2, p=0.01). Cervical cancer screening was not statistically correlated with awareness of cervical cancer risk factors (χ^2=2.668, df=2, p=0.263).

Table 3: Binary logistic regression with significant variables on sociodemographic factors.

Variables	B	SE	df	OR	95% CI Lower	95% CI Upper	P value
Age (years)			4				0.02
25-29	-1.506	0.660	1	0.22	0.243	0.846	0.023
30-34	1.245	0.662	1	3.473	0.949	12.714	0.060
35-39	1.441	0.596	1	4.225	0.314	13.585	0.116
40-44	0.309	0.596	1	1.362	0.424	4.375	0.204
45-49				(Ref)			
Marital status			4				0.01
Married	0.606	0.855	1	1.832	1.343	9.790	0.025
Divorced	1.280	1.164	1	3.598	0.390	6.025	0.479
Single	0.311	0.870	1	1.211	0.184	5.565	0.190
Widowed	-0.605	1.417	1	0.535	0.029	2.636	0.068
Separated				(Ref)			
Parity status			2				0.74
Multiparous	1.353	1.264	1	3.933	0.382	4.743	0.149
Primiparous	0.592	0.213	1	1.652	0.570	2.160	0.138
Nulliparous				(Ref)			
Education level			4				0.321
College/university	1.23	0.709	1	3.451	0.809	5.118	0.180
Vocational	1.15	0.731	1	2.165	0.344	4.300	0.163
Secondary	0.463	3.748	1	1.581	0.043	5.470	0.182
Primary	-0.751	0.414	1	0.481	0.379	1.592	0.159
No formal education				(Ref)			
Income level			3				0.001
>30000 Ksh	0.32	0.617	1	1.381	0.114	2.276	0.118
20001-30000 Ksh	1.688	0.470	1	5.4	2.074	6.464	0.001
10001-20000 Ksh	-0.118	0.437	1	.898	0.404	1.992	0.291
<10000 Ksh				(Ref)			

Table 4: Cross-tabulation between health awareness factors and the uptake of cervical cancer screening.

Variables	Categories	Dependent variable (cervical cancer screening) Screened (n=99)	Not screened (n=147)	Statistical significance (chi-square test)
Knowledge of cervical cancer risk factors (Likert scale aggregate)	Strongly agree and agree (knowledgeable)	36 (47.4)	40 (52.6)	χ^2=3.199 df=2 p=0.202
	Neutral	27 (41.5)	38 (58.5)	
	Strongly disagree and disagree (not knowledgeable)	36 (34.3)	69 (65.7)	
Knowledge of cervical cancer screening services (Likert scale aggregate)	Strongly agree and agree (knowledgeable)	69 (42.3)	94 (57.7)	χ^2=2.668 df=2 p=0.263
	Neutral	21 (42)	29 (58)	
	Strongly disagree and disagree (not knowledgeable)	9 (27.3)	24 (72.7)	
Knowledge of cervical cancer signs and symptoms (Likert scale aggregate)	Strongly agree and agree (knowledgeable)	37 (32.5)	77 (67.5)	χ^2=8.693 df=2 p=0.01
	Neutral	22 (59.5)	15 (40.5)	
	Strongly disagree and disagree (not knowledgeable)	40 (42.1)	55 (57.9)	
Cervical cancer awareness	Yes	73 (48)	79 (52)	χ^2=10.018 df=1 p=0.002
	No	26 (27.7)	68 (72.3)	

Table 5: Binary logistic regression with significant variables on accessibility factors.

Variables	B	SE	df	OR	95% CI		P value
					Lower	Upper	
Awareness of CC signs and symptoms			2				0.02
Knowledgeable	0.419	0.294	1	1.5	1.154	2.704	0.01
Neutral	-0.649	0.402	1	.522	0.238	1.148	0.106
Not Knowledgeable				(Ref)			
Awareness of cervical cancer	0.855	0.286	1	2.4	1.342	4.122	0.003
No				(Ref)			

As indicated in Table 4, study participants who were aware of cervical cancer signs and symptoms were 1.5 times more likely to be screened for cervical cancer than those who were not aware (OR=1.5, 95% CI; 1.154-2.704, p=0.01). In addition, study participants who were aware of cervical cancer were 2.4 times more likely to be screened for cervical cancer than those who were not aware (OR=2.4, 95% CI; 1.342-4.122, p=0.003).

These findings disagreed with the qualitative findings where one of the key informants narrated that;

"….I have noticed many women fear cancer, but when we explain that screening helps detect abnormal cells before they turn into cancer, it reduces their anxiety. Awareness helps them see screening as a preventive step, not something to be afraid of…..." (KII 2, Nurse, 2024).

DISCUSSION

Over one-third (40.2%) of the study respondents had been screened for cervical cancer. These findings were close to those of a study carried out in Ethiopia, where the uptake of cervical cancer screening was 38.7%.[18] Another study carried out in Ethiopia recorded a higher (62.9%) uptake of cervical cancer screening.[19] The difference between recorded prevalence can be attributed to different age groups and different sampling strategies.

From this study, study participants aged 25-29 were less likely to seek cervical cancer screening services as compared to those aged 45-49 years. This could be linked to the fact that younger women may perceive themselves as at lower risk for cervical cancer and, therefore, may prioritize other health concerns over screening. These findings agreed with those of a study carried out in Kenya.[20] These findings were contrary to those of another cross-sectional survey, where there was no association between age and uptake of cervical cancer screening.[21] This could be linked to the fact that if awareness of cervical cancer screening is uniformly high across different age groups, age may not be a significant factor in determining screening behavior.

In addition, study respondents who were married were 1.8 times more likely to seek cervical cancer screening services as compared to those who were separated. These findings were in agreement with those of a study carried out in Korea.[22] Married women might have better access to health services due to their relationship with healthcare providers during pregnancy and childbirth. Study respondents earning 20001-30000 Ksh were 5.4 times more likely to seek cervical cancer screening services as compared to those earning below 10000 Ksh. These findings were concurrent with those of a systematic review where income was associated with the uptake of cervical cancer screening.[23] This could be linked to the reason that higher-income levels typically provide better access to healthcare services, including preventive screenings.

Study participants who were aware of cervical cancer signs and symptoms were 1.5 times more likely to be screened for cervical cancer than those who were not aware. This knowledge can prompt them to seek medical advice and screening sooner, leading to early detection. These findings were consistent with those of the other two studies carried out in Tanzania and Ethiopia.[24,25] From this study, study participants who were aware of cervical cancer were 2.4 times more likely to be screened for cervical cancer than those who were not aware. When women are informed about the causes of cervical cancer, such as the link between human papillomavirus (HPV) infection and cancer development, they become more motivated to seek preventive measures like screening for cervical cancer. Findings from this study were consistent with those of a study carried out in Tharaka-Nthi county in Kenya and southern India.[26,27]

CONCLUSION

The uptake of cervical cancer screening in this study was relatively low (40.2%), reflecting missed opportunities for early detection and prevention. Key determinants of screening included higher income (20,001-30,000 Ksh), marital status, awareness of cervical cancer signs and symptoms, and general knowledge of cervical cancer. Conversely, women aged 25-29 were less likely to undergo screening, highlighting an age-related gap in service utilization. To improve screening uptake, targeted health education and awareness campaigns should be intensified, particularly among younger women, to address misconceptions and encourage preventive health-seeking behaviors. Additionally, policymakers should

consider subsidizing screening costs and integrating cervical cancer screening into routine reproductive health services to enhance accessibility, affordability, and coverage.

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