
Research Article

Individual-Level Factors that Contribute to Delayed Cervical Cancer Diagnosis among Patients in Kenya; A Hospital-Based Assessment

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Abstract

Cervical cancer ranks 4th as the most prevalent cancer among women worldwide. In Kenya, it is the 2nd most frequently diagnosed cancer and the leading cause of cancer-related deaths among women. Globally, more than 50% of Cervical Cancer diagnoses are made late, with this proportion rising to over 80% in developing countries. This study aimed to determine the individual-level factors contributing to delayed cervical cancer diagnosis. A cross-sectional hospital-based study was adopted to collect data on; Socio-demographics, affordability and use of health insurance, Cervical cancer and Human Papillomavirus (HPV) screening awareness, Prior HPV screening, Diagnosis circumstances, Time taken to seek medical attention, Fears and social support experiences, from 139 cervical cancer patients systematically sampled at the Kenyatta National Hospital, using a semi-structured questionnaire. Additionally, 8 Key Informants were purposively selected, to provide in-depth information. Associations between stage at diagnosis and individual-level factors were tested using logistic regression at 95% Confidence Interval. The mean age was 51 years and all participants were African and Christians. Majority (63.31%) were married and educated up to primary level, and more than half (61.15%) were unemployed. The prevalence of delayed diagnosis was 86(61.9%). The Risk Factors for delayed diagnosis were; Older age; 50-59 (p-value=0.049) & 60-69 years (0.013), Lack of HPV screening awareness (P-value=0.017), and Seeking medical attention only due to a symptomatic trigger (P-value=0.030). In corroboration, qualitative information reported that, inability to afford diagnosis costs, lack of awareness and poor medical care seeking habits, contribute to delayed diagnosis. The study identified gaps in awareness of Cervical Cancer and HPV screening among women and affordability of diagnosis costs. More community-level awareness should be created and, increase of centers and resources for diagnosis and free screening. Women should also be encouraged to pay for the National Health Insurance Fund (NHIF), so as to lessen their financial burden of diagnosis.

Keywords: Cervical cancer; Delayed diagnosis; Patient-related factors; Access to health; Health-seeking habits; Social support.

Introduction

Cervical Cancer is ranked in 4th place among malignancies affecting women, worldwide [1]. It is a cancer that can be prevented if detected and treated early, yet it remains a significant menace in most developing countries [2]. According to the International Agency for Research in Cancer [3] report, there are approximately 660,000 new cervical cancer cases and nearly 350,000

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cervical cancer-related deaths worldwide, an increment from 311,000 deaths as reported in 2018. In Africa, it is reported that there are about 125,000 incidences annually, and it is ranked second in causing cancer related deaths among women, as it is responsible for about 80,000 deaths, mostly among women of age between 14-44 years [4]. The Eastern Africa region where Kenya is located, leads in incidences and mortality cases. As of 2022, Cervical cancer comes second after breast cancer as the commonly diagnosed cancer among women in Kenya, recording almost 6,000 incidence cases. It is the leading cause of cancer-related deaths among women, causing 3,600 deaths, which accounts for approximately 12% of all cancer deaths in Kenya [4]. Stage at the time of diagnosis is a vital prognostic factor for treatment outcomes [5]. Overall literature shows that, prolonged waiting times before diagnosis, increase the risk for poor cancer outcomes [5]. Any hindrances in accessing medical care, delays diagnosis and/or treatment, resulting to invasive cervical cancer and low survival rates, whilst contributing notably to the high mortality rates [6]. Disparities in Cervical cancer occurrence rates show that developing countries carry 90% of the cervical cancer burden [7]. Globally, more than 50% [8], and approximately 80% of all cervical cancer diagnoses in developing countries, are made at advanced stages [6]. Studies have shown that Early diagnosis (at Stages IA to IIB) improves survival rates & treatment outcomes, yielding a 98% 5-year survival rate, while delayed diagnosis (Stages IIIA to IVB), increases risk of poor outcomes, reducing it to 17% 5-year survival rate [6]. Patients face overwhelming long-term effects, especially those who need palliative care [8]. This study determined to assess the individual-level factors that contribute to delayed diagnosis of cervical cancer among patients at the Kenyatta National Hospital, Kenya (KNH).

Materials & Methods

The study adopted an analytical cross-sectional mixed method design and was conducted in a National Referral and Teaching Hospital in Kenya. 139 Cervical Cancer patients diagnosed and receiving treatment at KNH, aged above 18, and diagnosed within the last one year since time of data collection were systematically sampled. The study excluded patients whose medical records did not have clear staging information, those diagnosed with other cancer types, those with recurrent Cervical Cancer, those in palliative care and those who were unwilling to participate. The participants were interviewed using a semi-structured questionnaire and quantitative data regarding their socio-demographics and other patient-level variables, such as; Affordability of Health Insurance, Cervical cancer and HPV screening awareness, Diagnosis circumstances, Medical-care seeking habits, fears and social support, was collected as independent variables. The key dependent outcome of delayed diagnosis was Stage at diagnosis, categorized as; Early (stages IA and IIB) or Delayed (IIIA and IVB) diagnosis using, The International

Federation of Gynaecology and FIGO staging system. The stage at diagnosis was retrieved from patients' medical files using abstraction forms. 8 Key Informants; Medical and Radio Oncologists, Nurses and Social Workers were interviewed using a Key Informant Guide and qualitative data was collected in audio recorded sessions, to provide in depth information and for triangulation purposes. Stata version 14.2 was used to conduct statistical analysis and the association between the predictors and dependent variables, was determined by logistic regression tests, at 95% Confidence Interval. Bivariate logistic regression was used to select potential predictors of delayed diagnosis, at statistically significant variables at p-value=0.05, to run in the multivariate model. Odds Ratios and p-Values were reported. Additionally, audio recordings for qualitative data were transcribed in verbatim, transcripts were verified and deductive thematic analysis done via NVIVO 14.

Results

Descriptive analysis results

Socio-demographic factors

Table 1: Distribution of Socio-demographic factors

Variable	Frequency(n=139)	Percent (%)
Age in years		
<40	22	15.83
40-49	49	35.25
50-59	42	30.22
60-69	18	12.95
70 and above	8	5.76
Ethnicity		
African	139	100
Religion		
Christian	139	100
Marital Status		
Married	88	63.31
Divorced/Widowed	28	20.14
Single	23	16.55
Residence		
Urban	59	42.45
Semi-urban	24	17.27
Rural	56	40.29
County of Residence		
Nairobi	54	38.85
Another County	85	61.15
Education		
Primary and below	95	68.35
High school	34	24.46
Tertiary	10	7.19

Employment Status		
Employed	54	38.85
Not employed	85	61.15
Monthly Income		
>25,000	15	27.78
10,000-25,000	17	31.48
<10,000	22	40.74

Table 1 shows the distribution of sociodemographic characteristics of the study population. 139 Participants were interviewed in September 2023. Majority 49(35.25%) of the participants were aged between 40-49 years and the mean age was 51 years. The age Inter-Quartile Range was 29-89. All participants were African and Christians. More than half 88(63.31%) of the participants were married, while 28(20.14%) were divorced or separated. Slightly less than half 59 (42.45%) were living in urban settings while, most of them 85(61.15%), resided in counties outside Nairobi. The rest 54(38.85%) reported to be residing within Nairobi county. Majority 95(63.31%) were educated up to primary level and below. More than half 85(61.15%) were reported as not employed and from the 54(38.85%) participants who were employed, majority 22(40.74%), were earning less than 10,000 Kenyan shillings per month.

Prevalence of delayed diagnosis

The Prevalence of delayed diagnosis (stages III and IV) was 61.87%.

Prevalence of delayed diagnosis

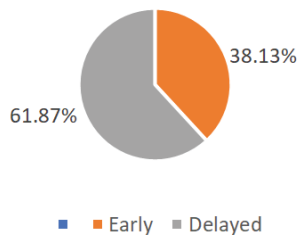


Figure 1: Prevalence of delayed diagnosis

In the qualitative findings, 7 of 8 key informants reported that most patients are diagnosed at stages 3 and 4

“...most patients are diagnosed at stage three and four when they are experiencing unbearable symptoms like pain...” (KII_2SW)

Individual-level factors

Distribution of participants across individual-level factors

Table 2 shows the frequencies of participants across the individual-level factors assessed. The study reported that 137(98.86%) participants reported to have the National

Table 2: Distribution of participants across individual-level factors

Variable	Frequency(n=139)	Percentage (%)
Have NHIF		
Yes	137	98.56
No	2	1.44
Who Pays NHIF		
Self	71	51.82
Family member	59	43.07
Well wisher	7	5.11
NHIF Meet Costs		
Yes	31	22.63
No	106	77.37
Who Pays Rest Cost		
Self	54	50.94
Family member	43	40.57
Well wisher	9	8.49
Have Private Insurance		
Yes	6	4.32
No	133	95.68
Cervical cancer Awareness		
Yes	91	65.47
No	48	34.53
Symptoms		
yes	81	89.01
no	10	10.99
HPV Screening Awareness		
Yes	53	38.13
No	86	61.87
Prior Screening		
Yes	40	28.78
No	99	71.22
Diagnosis Circumstances		
Symptomatic trigger	117	84.17
Random/Routine visit	22	15.83
Time to seek medical attention		
<6 months	80	57.55
6-12 months	25	17.99
>1 year	34	24.46
Fears		
Yes	71	51.08
No	68	48.92
Social Support		
Yes	72	51.8
No	67	48.2

Health Insurance Fund cover; with 106 (77.37%) participants of them reporting that the national insurance did not fully meet their medical costs. Only 6 (4.32%) participants had private insurance, while 133(95.68 %) lacked private insurance due to various reasons such as; high cost, lack of awareness and satisfied with NHIF. More than half of the participants 91(65.47%) were aware of cervical cancer before diagnosis and among these, 81(89.01%) experienced symptoms related to cervical cancer before diagnosis. Most participants 86 (61.87%) were not aware of HPV screening and 99(71.22%) had not had prior HPV screening, before diagnosis. 117(84.17%) participants reported to have sought medical attention only after a symptomatic trigger, with 34(24.46%) taking over one year to seek medical attention after first symptoms. The symptoms reported to have been experienced included; Abdominal and lower back pain, vaginal bleeding, spotting after sexual intercourse, Vaginal Itchiness and discharge with foul smell, Fatigue and Dizziness due to excessive bleeding, Loss of appetite, Headache, Swollen and pain in legs, Vomiting and Constipation. Slightly more than half of the participants 71(51.08%,) reported that they had fears that may have hindered them from seeking early medical attention. Most of them reported outcome of diagnosis as their main reason for fear of seeking medical attention among other reasons.

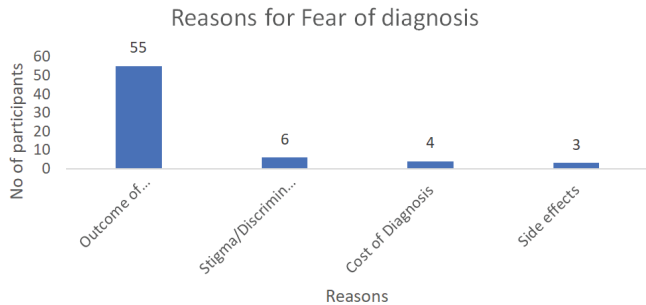


Figure 2: Distribution of reasons of fear of diagnosis.

More than half 72(51.8%), of the participants reported to have received social support during diagnosis periods, from family members 63(79.7%), church 4(5.1%), friends 6(7.6%) and neighbours 6 (7.6%).

Inferential analysis results

The study adopted a structured approach in the analysis, moving from binary logistic regression to multivariate logistic regression to understand the independent variables associated with delayed diagnosis while accounting for potential confounders. In the bivariate analysis, the study examined the relationship between each independent variable individually and the dependent variable (delayed diagnosis) using binary logistic regression. The purpose was to identify which independent variables were statistically significant potential predictors of the outcome at a 95% confidence level

(p-value < 0.05). Variables found to be statistically significant at p-value < 0.05, were the selected to be run in the multivariate logistic regression model to show the independent variables that were independently associated with delayed diagnosis, after controlling for any confounders. To ensure the validity of the regression results, multi-collinearity among potential predictors identified in bivariate analysis, was checked to determine the true effects of individual variables on the outcome, improve the interpretability of the regression model and enhance model performance in predicting the outcome variable, leading to more stable and reliable estimates. Additionally, the study assumed that the observations were independent of each other, which is another crucial assumption in regression analysis.

Association between socio-demographic factors and delayed cervical cancer diagnosis

Table 3 summaries the relationship between delayed diagnosis and socio-demographic factors assed in the bivariate analysis. Across the eight socio-demographic factors, only two were found to be potentially associated with delayed diagnosis. There was an increased Odds Ratio of being diagnosed late among patients aged between 60-69 years (p-value= 0.011) compared to those aged below 40 years and among non-employed patients (0.009) compared to the employed patients.

A multi-collinearity check was done and the two significant variables; Age in years and Employment status were moved into a multivariate regression test model and Table 4 demonstrates, the multivariate logistic regression results at 95% confidence interval, reporting the p-value and Adjusted Odds Ratios. Only age in years remained to be significantly associated to stage at cervical cancer diagnosis. Patients aged between 50-59 years (p-value=0.049) and 60-69 years (p-value=0.013), were more likely to be diagnosed at advanced stages of cervical cancer compared to those aged below 40 years

In corroboration with the findings shown in table 4, Key Informants views alluded that most older patients delayed diagnosis due to lack of finances because most of them lacked income to cover for the high diagnostic costs.

“...So, if someone does not have an income, how will they afford all those processes? You see, it becomes a problem.” (KII_2SW)

Association between individual-level factors and delayed cervical cancer diagnosis

Table 5 shows that, across the thirteen factors under the individual level factors category, five were found to be potentially associated with delayed diagnosis in the bivariate analysis; Having the NHIF cover paid by a family member (p-value=0.017), Lack of Cervical cancer awareness before diagnosis (0.009), Lack of HPV screening awareness before

Table 3: Association between socio-demographic factors and delayed Cervical Cancer diagnosis; Bivariate analysis

Variable		Early (%)	Delayed (%)	Crude Odds Ratio (95% Confidence Interval)	P-value
		n=53	n=86		
Age in years					
	>40	13(59.09)	9(40.91)	Ref	
	40-49	24(48.98)	25(51.02)	0.665(0.240-1.839)	0.431
	50-59	13(30.95)	29(69.05)	2.142(0.905-5.067)	0.083
	60-69	2(11.11)	16(88.89)	7.680(1.593-37.028)	0.011*
	70 and above	1(12.50)	7(87.50)	6.720(0.768-58.789)	0.085
Marital Status					
	Single	8(34.78)	15(65.22)	1.360(0.523-3.1541)	0.528
	Married	37(42.05)	51(57.95)	Ref	
	Divorced/Widowed	8(28.57)	20(71.43)	1.814 (0.721-4.564)	0.206
Residence					
	Urban	23(38.98)	36(61.02)	Ref	
	Semi-urban	7(29.17)	17(70.83)	1.552(0.557-4.320)	0.400
	Rural	23(41.07)	33(58.93)	0.916(0.435-1.934)	0.819
County of Residence					
	Nairobi	23(42.49)	31(57.41))	Ref	
	Another County	30(35.29)	55(64.71)	1.360(0.676-2.737)	0.388
Education					
	Tertiary	5(50.00)	5(50.00)	Ref	
	High school	17(50.00)	17(50.00)	1.000(0.244-4.097)	1.000
	Primary and below	31(32.63)	64(67.37)	2.065(0.556-7.664)	0.279
Employment Status					
	Employed	28(51.85)	26(48.15)	Ref	
	Not employed	25(29.41)	60(70.59)	2.585(1.272-5.252)	0.009*
Monthly Income in KShs					
	>25,000	5(33.33)	10(66.67)	Ref	
	10,000-25,000	11(64.71)	6(35.29)	0.273(0.063-1.178)	0.082
	<10,000	12(54.55)	10(45.45)	0.417(0.107-1.628)	0.208

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Table 4: Association between delayed diagnosis and socio-demographic factors

Variable	Adjusted Odds Ratio	95% Confidence Interval	P-value
Age in years			
<40	Ref		
40-49	1.447	0.516-4.058	0.482
50-59	2.979	1.005-8.833	0.049*
60-69	8.987	1.598-50.559	0.013*
70 and above	7.941	0.808-78.077	0.076
Employment Status			
Employed	Ref		
Not employed	1.892	0.893-4.011	0.096

*Statistically significant at P-value of less than 0.05

Table 5: Association between Individual-level factors and delayed Cervical Cancer diagnosis; bivariate analysis

Variable	Early (%) n=53	Delayed (%) n=86	Crude Odds Ratio (95% Confidence Interval)	P-value
Have NHIF				
Yes	52(37.96)	85(62.04)	Ref	
No	1(50.00)	1(50.00)	0.612(0.037-9.992)	0.73
Who pays NHIF				
Self	34(47.89)	37(52.11)	Ref	
Family Member	16(27.12)	43(72.88)	2.470(1.180-5.171)	0.017*
Well wisher	2(28.57)	5(71.43)	2.300(0.418-12.633)	0.339
NHIF Meet Costs				
Yes	13(41.94)	18(58.06)	Ref	
No	39(36.79)	67(63.21)	1.241(0.549-2.804)	0.604
Who Pays Rest Cost				
Self	23(42.59)	31(57.41)	Ref	
Family Member	11(25.58)	32(74.42)	2.158(0.903-5.162)	0.084
Well wisher	5(55.56)	4(44.44)	0.594(0.143-2.458)	0.472
Have Private Insurance				
Yes	4(66.67)	2(33.33)	Ref	
No	49(36.84)	84(63.16)	3.429(0.606-19.408)	0.164
Cervical Cancer Awareness				
Yes	42(46.15)	49(53.85)	Ref	
No	11(22.92)	37(77.08)	2.883(1.310-6.348)	0.009*
Symptoms				
Yes	35(43.21)	46(56.79)	Ref	
No	7(70.00)	3(30.00)	0.326(0.079-1.352)	0.123
HPV Screening Awareness				
Yes	31(58.49)	22(41.51)	Ref	
No	22(25.58)	64(74.42)	4.100(1.975-8.508)	0.000*
Prior Screening				
Yes	23(57.50)	17(42.50)	Ref	
No	30(30.30)	69(69.70)	3.111(1.456-6.650)	0.003*
Diagnosis Circumstances				

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	Symptomatic trigger	40(34.19)	77(65.81)	2.781(1.095-7.060)	0.031*
	Random/Routine visit	13(59.10)	9(4.91)	Ref	
Time to seek medical attention					
	<6 months	29(36.25)	51(63.75)	Ref	
	6-12 months	8(32.00)	17(68.00)	1.208(0.465-3.143)	0.698
	>1 year	16(47.06)	18(52.94)	0.640(0.284-1.443)	0.282
Fears					
	Yes	31(43.66)	40(56.34)	0.617(0.309-1.232)	0.171
	No	22(32.35)	46(67.65)	Ref	
Social Support					
	Yes	21(29.17)	51(70.83)	Ref	
	No	32(47.76)	35(52.23)	0.450(0.224-0.906)	0.025*

diagnosis (0.000), Lack of Prior HPV screening (0.003), Patients seeking medical attention only after they had a symptomatic trigger (0.031) and Lack of social support (p-value 0.025). A multi-collinearity check was done and only two variables; HPV screening awareness and Prior HPV screening had a high positive correlation of 0.7. The variable Prior diagnosis was thus, excluded from the model and a multivariate logistic regression test model was run. Patients who lacked HPV screening awareness before diagnosis were found to be 2.7 times more likely to be diagnosed at advanced stages than those who were aware of HPV screening before diagnosis (p-value=0.017) and those who only sought medical attention after they experienced symptoms were 3.2 times more likely to be diagnosed late than those who

Table 6: Association between Individual-level factors and delayed diagnosis

Variable	Adjusted Odds Ratio	95% CI	p-value
Who Pays NHIF			
Self	Ref		
Family Member	1.631	0.707-3.751	0.25
Well Wisher	2.782	0.461-16.814	0.265
Cervical Cancer Awareness			
Yes	Ref		
No	2.149	0.864-5.341	0.1
HPV Screening Awareness			
Yes	Ref		
No	2.712	1.196-6.151	0.017*
Diagnosis circumstances			
Symptomatic trigger	3.202	1.116-9.188	0.030*
Random/Routine hospital visit	Ref		
Social support			
Yes	Ref		
No	0.576	0.260-1.278	0.175

sought medical attention due to random or routine visits (p-value=0.030).

Findings from Key Informants supported the quantitative findings, as Health Care Workers reported that most patients had delayed diagnosis due to, Lack of finances or health insurance covers and beliefs and cultural norms, indicating that there is lack of awareness. All the patients had to be taken through counselling sessions by social workers to explain to them their condition and how to manage it. Due to lack of awareness most patients only sought medical attention due to worsening of symptoms and after abnormal HPV screening results. See figure 4.6

“For sure these patients do not know or understand what they are going through. Imagine there are those who believe that they have been bewitched by their bad relatives, ummh.... they go to their traditional doctors first. Only until the pain is too much is when they visit the hospital.” (KII_NU)

“... Most of them do not have NHIF when they come...we advise them to take up NHIF after they come to the hospital... you know NHIF takes 60 days to mature ...during this time the disease keeps growing...” (KII_2SW)

“...they manage the pain at home until it becomes unbearable. That is when they come here...” (KII_MO)

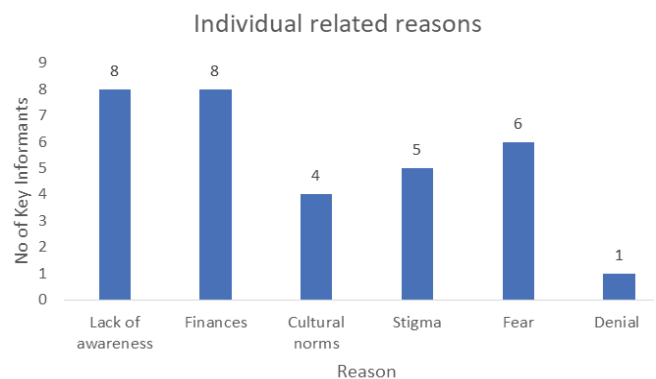


Figure 3: Key Informants’ views on Individual-level related reasons that contribute to delayed diagnosis

Discussion

Prevalence of delayed diagnosis

The prevalence of delayed diagnosis (61.87%). This prevalence is close to a population study done in Ethiopia where the prevalence of delayed diagnosis was 60.4, and slightly lower than that of a cross sectional study done in Uganda that was reported as 66% [9, 10].

Socio-demographic factors

In this study, women aged between 50 to 69 years were found to be more likely to have delayed diagnosis than younger women. This finding was homogenous with that of a study done in California that found out that, women aged 65 years and above, had an increased Odds Ratio for delayed diagnosis [11]. Most older participants in this study reported to reside in counties away from Nairobi where KNH is located, and in rural areas. This could limit their access to proper screening and diagnostic services [11]. Due to lack of awareness, studies suggest that older patients have lower recognition of signs and symptom related to cancer and they risk being misdiagnosed with other health issues such as post-menopausal bleeding, than younger women [12]. Older patients, who live in rural settings and visit traditional healers, have also been previously shown to have increased odds of delayed diagnosis [13].

Most cancer patients often lack social support and face stigma and discrimination [7]. Qualitative findings also showed that, most older women are not aware of cervical cancer and screening, and they believe in cultural norms and myths. They face stigma and discrimination and they often seek help from traditional healers first before seeking medical help. They only turn to seek medical attention when their symptoms worsen. This study however, did not agree with a descriptive study done in KNH that did not find age to be a risk factor for delayed diagnosis [8]. This difference could be explained as that the survey had very few participants aged 60 years and above compared to the study sample size.

Non-employment was reported to be a potential predictor of delayed diagnosis. This study revealed that, Older women lack financial income, thus, they are financially dependent. Their NHIF fees are paid for by family members or well-wishers and they thus lack the autonomy to make decisions regarding medical care seeking. NHIF is a Kenya government state corporation with a mandate to provide accessible, affordable, sustainable and quality health insurance to Kenyans. NHIF covers diagnosis fee for patients who pay for it consistently without defaulting. High costs of cervical cancer diagnosis present affordability complexities among patients, as non-employed women may not likely be able afford cervical cancer diagnosis costs or health insurance [12, 14]. Cervical Cancer patients lack social support from

family members and the community, because of stigma and discrimination or being sidelined by the family members for fear of being financial burden [7, 8]. This study revealed that, most patients who visit KNH are needy and lack NHIF cover on arrival for diagnosis. Social workers advise them to take up NHIF cover after consultation, to help with the diagnosis cost. The insurance normally takes up to two months to mature, for use, and this may contribute further to the delays if the family members supporting the patients do not consistently pay for NHIF. Women whose health is insured are less likely to be diagnosed at late stages of cancer, as they are more confident in and able to afford routine HPV screening and gynaecological care which can improve early diagnosis [12]. Women, who are unable to afford screening and gynaecological services, are thus disadvantaged from receiving the benefits that come with early identification of cancer [15, 16].

Fear of cost of diagnosis and treatment of cervical cancer is one of the major reasons why some patents fail to seek medical care, as they fear going into financial catastrophe [17]. This could be a reason why women who lack good income and are unable to afford diagnosis fail to seek early medical attention that may led to delay in diagnosis [8].

Individual-level factors

Knowledge and awareness about cancer among the general population and medical personnel is important in making decision regarding health seeking behaviours, thus, improving early cancer diagnosis [16]. The significant association between lack of cervical cancer awareness and delayed diagnosis was similar to that of a study conducted in Ethiopia [18]. Qualitative findings from this study explained that, most patients are not aware of the disease and they believe in myths. Most women do not know the symptoms associated with cervical cancer and often seek help from traditionalists or buy over the counter drugs. They only visit the hospital when the symptoms worsen and are unbearable. Some symptoms such as Vaginal bleeding, discharge, odour and itching are similar to those of other infections.

“You see ... some cervical cancer symptoms’ are similar to symptoms of other issues like family planning side effects or infections, so if one does not know about it, they might take time to seek help with hope that it will go away on its own.”
(KII_1SW)

Women who lack knowledge on what causes and how cervical cancer manifests, may think it is normal and fail to seek early medical care [18, 19]. Qualitative findings revealed that, most clinicians from local periphery health facilities, have low suspicion index, and often misdiagnose the patients. This could be due to lack of knowledge and awareness on the disease. These findings corroborated with previous studies that showed that, inadequate knowledge

on cervical cancer and patient information by healthcare providers, are factors that may lead to delayed diagnosis [16]. During cancer awareness campaign days, it was reported that the posters are normally printed in English, and thus, may not reach as many women as possible. These findings were similar to those of a study on in Cote D'Ivoire, which noted that, inadequacies in national awareness and screening campaigns, are among the contributors to delayed diagnosis of cervical cancer [16]. Cancer screening strategies are vital in the fight against high invasive cancer cases in Africa [13, 15]. HPV Screening helps to identify abnormalities in the cervix early and cervical cancer at its most curable state, and improves survival rates as it allows for timely treatment [8, 17]. Availability of HPV screening services have gradually increased in Kenya, but most sexually active women are not aware and do not utilize them [6]. In this study, participants who were not aware of and had not sought prior HPV screening before cervical cancer diagnosis were more likely to have delayed diagnosis compared to those who were aware of HPV screening before diagnosis. In another study, 72% of its participants who were not aware of cervical cancer nor its screening, experienced delayed diagnosis [18]. A study conducted in Botswana, revealed that women who underwent screening had lower odds of late-stage disease at diagnosis compared to those who did not report screening [13]. Seeking annual gynaecological visits and HPV screening increases the chance of abnormalities being detected, thus, benefit timely diagnosis of cervical cancer [17]. The proportion of those who lacked HPV screening awareness and experience, was slightly lower from that of a study done in KNH in 2014, showing that more women may have embraced the screening behaviour [8]. Otherwise, both studies show that lack of Screening has a significant association with delayed diagnosis. Qualitative findings showed that, screening services at KNH are not free and that, women who seek the services must pay for them. This could be a major reason why the proportion of those who have had prior HPV screening is still low, as only women who can afford to pay, can access the service. Free awareness is only offered bi-annually during cancer awareness campaign days.

Conclusion

This study concluded that more than half of KNH cervical cancer diagnoses are made at stages III and IV found the prevalence of delayed cervical cancer diagnosis among cervical cancer patients at the KNH to be 61.87%. Both Both older age and non-employment status are major contributors to delayed cervical cancer diagnosis. Older age and non-employment status were the socio-demographic factors found to be associated with delayed cervical cancer diagnosis. The study also noted that, inadequate cervical cancer and HPV screening awareness among women especially in rural settings and high diagnostic costs, are to be a major hindrance to timely

diagnosis of cervical cancer. Intensified community-level Cervical Cancer and HPV screening awareness programs, to target older aged women especially in rural settings, so as to motivate them to embrace routine screening and seek early medical attention. Further awareness on NHIF take up especially for older and needy women to help avoid financial burden during diagnosis. Equitable decentralization and increase of HPV screening and Cancer diagnosis resources, including trained medical officers, so as to lessen the burden of referral challenges and diagnosis delays, whilst targeting women from all socio-demographic settings, to improve timely diagnosis.

List of Abbreviations

1. ERC- Ethical Review Committee
2. FIGO – The International Federation of Gynaecology and Obstetrics
3. JKUAT – Jomo Kenyatta University of Agriculture and Technology
4. KIIs – Key Informant Interviews
5. KNH- Kenyatta National Hospital
6. NACOSTI- National Commission for Science, Technology & Innovation
7. NHIF- National Health Insurance Fund
8. PPPs- Public Privates Partnerships
9. STIs- Sexually Transmitted Infections
10. UON- University of Nairobi
11. UTIs- Urinary Tract Infection
12. TICH-Tropical Institute of Community Health and Development

Declarations

Ethics approval and consent to participate

The research ethical clearance and approval was obtained from the JKUAT and KNH-University of Nairobi (UON) Ethical Review Committees (ERCs), under approval numbers JKU/ISERC/02316/0818 and P522/06/2023 simultaneously, and a Research permit obtained from the National Commission for Science, Technology & Innovation (NACOSTI), under license number, NACOSTI/P/23/24644. A study certificate was also issued from the KNH Medical Research Department, to allow registration of the research project and data collection. All participants gave written consent for face-to face administered interviews or oral informed consent for telephone administered interviews to participate in the study. Authorization to access and use patient contact information for telephone interviews and hospital medical records was sought from the KNH hospital administration. Participants

were interviewed in privacy and data collected was handled with confidentiality, through the use of identity codes to conceal the patient identities and limiting access to the raw data collected to the Principal Investigator only.

Competing interests

The authors declare that they have no competing interests.

Author's contributions

MKZ conceptualized and designed the Research, collected patient data, analysed and interpreted the data, and developed and revised the manuscript for submission.

JN, SM and CO conceptualized and designed the Research and revised the manuscript for submission.

BK revised the manuscript for submission

All authors read and approved the final manuscript

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