

Determinants of Cervical Cancer Screening among Women Aged 25 to 65 Years in a Semi-Rural Area in Cameroon

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ABSTRACT

Background: Cervical cancer is the fourth most common cancer globally and the second leading cause of cancer-related deaths among women in low- and middle-income countries. Screening is a critical prevention and control strategy. This study investigates the factors influencing the uptake of cervical cancer screening services among women aged 25-65 in Kumba, Cameroon.

Methods: A cross-sectional study was conducted in Kumba, involving 400 women aged 25-65 years who provided informed consent. Data were collected using a structured questionnaire, divided into four sections: knowledge of cervical cancer, uptake of cervical cancer screening, and factors facilitating or hindering screening. Data were analyzed using SPSS version 26, and inferential statistical analyses, including logistic regression, were performed to identify determinants of cervical cancer screening uptake. Results were presented in tables and figures.

Results: The mean age of participants was 33.78 years, with the majority (64.3%) between 25-29 years. 64.0% of participants had adequate knowledge of cervical cancer, while 43.0% reported having undergone cervical cancer screening. Women residing in the Kumba Town Health Area were more likely to participate in screening compared to those in the Fiango Health Area (AOR=2.55, CI=1.20-5.44, p value= 0.023). Women aged 35-44 years were more likely to undergo screening than those aged 25-34 years (AOR=1.96, CI=1.03-3.71, p value=0.041). Adequate knowledge of cervical cancer was associated with a higher likelihood of screening uptake (AOR=2.96, CI=1.56-5.59, p value=0.003). Additionally, having a relative who had been screened increased the likelihood of participation in screening by 3.8 times (AOR=3.82, CI=2.08-7.00, p value=<0.000).

Conclusions: This study identified key determinants of cervical cancer screening uptake, including age (35-44 years), adequate knowledge of cervical cancer, and having a screened relative. The results highlight the need for targeted interventions to improve awareness and accessibility of screening services, particularly in under-screened areas like Fiango Health Area. Public health strategies should focus on increasing educational campaigns and encouraging family involvement in screening programs to enhance uptake in similar settings.

Keywords: Kumba, Uptake, Cervical Cancer, Screening, Determinants.

INTRODUCTION

Cervical cancer is a leading cause of cancer-related deaths among women globally, particularly in low- and middle-income countries (LMICs). It is primarily caused by persistent infection with high-risk types of the human papillomavirus (HPV), with types 16 and 18 being the most oncogenic (Okyere et al., 2021; Simo et al., 2021). HPV, a family of double-stranded DNA viruses, is classified into two groups: non-oncogenic (low-risk) and oncogenic (high-risk) types. While low-risk HPV strains can lead to anogenital warts and respiratory infections, high-risk strains are associated with an increased risk of cancers, including cervical, anal, and oropharyngeal cancers (Bencherit et al., 2022; Bedell et al., 2020).

Cervical cancer is unique in that it has a long pre-invasive phase during which precancerous lesions can be detected and treated through screening, preventing progression to invasive disease (Ahmed et al., 2013; Ayenew et al., 2020). Despite being a preventable disease with early detection, cervical cancer remains the fourth most common cancer among women worldwide, with nearly 90% of related deaths occurring in LMICs (Donatus et al., 2019). In Sub-Saharan Africa, where access to screening and treatment remains limited, cervical cancer is a major public health challenge (Balogun et al., 2012; Tadzong-Awasum & Morgan, 2021).

In Cameroon, cervical cancer accounts for approximately 24% of cancer cases among women of reproductive age, yet the uptake of cervical cancer screening remains alarmingly low at only 19.6% (Donatus et al., 2019). The low utilization of screening services is a critical concern, as early diagnosis and treatment are essential for improving survival rates. Factors contributing to the low uptake include limited awareness, cultural barriers, and poor access to healthcare services.

This study aimed to identify the determinants of cervical cancer screening uptake among women aged 25-65 in Kumba, a semi-rural area in Cameroon. Specifically, it assessed women's knowledge of cervical cancer, determined the level of screening uptake, and identified key factors influencing this uptake. Understanding these determinants is crucial for designing effective public health interventions tailored to local needs. The findings from this study will inform the development of policies and programs to improve the uptake of cervical cancer screening services in Kumba and other areas with similar socio-cultural and healthcare characteristics.

MATERIALS AND METHODS

Study Design

This was a community-based, cross-sectional, analytical study.

Study Duration and Period

The study spanned from October 2023 to June 2024, with data collection occurring between January and April 2024.

Study Area

The study was conducted in Kumba, a major town in the South West Region of Cameroon, divided into Kumba North District (KND) and Kumba South District (KSD). According to epidemiological reports from January to June 2023, KND and KSD had a combined population of 401,239, with KSD's population roughly double that of KND. KSD comprises seven health areas, while KND has six. Kumba is predominantly inhabited by the Bakossi and Bafaw ethnic groups, among others. Three major facilities in Kumba offer cervical cancer screening services: Kumba Baptist Hospital (Pulletin Health Area, KND), Regional Hospital Annex Kumba (KSD), and Presbyterian Hospital Mayemeng (Kossala, Fiango Health Area, KSD). These facilities offer cervical cancer screening using HPV DNA testing, Pap smears, and visual inspection with acetic acid (VIA) and visual inspection with Lugol's iodine (VILI), following WHO recommendations. While WHO guidelines recommend screening beginning at age 21, this study adopted the more recent American Cancer Society recommendations, focusing on women aged 25-65.

Target Population

The study included all women aged 25-65 residing in Kumba.

Inclusion and Exclusion Criteria

Women aged 25-65 residing in Kumba who were able to provide informed consent were included. Women unable to answer questions due to serious physical or mental illness were excluded. "Medically fit" in this context refers to the ability to participate in the interview process and provide informed consent, not a clinical assessment of suitability for screening.

Sample Size and Sampling Technique

- Sample Size Determination:** The sample size was calculated using Cochran's formula $n_0 = \frac{Z^2(p)(q)}{e^2}$ Where n_0 = minimum sample size required for infinite population z =standard normal deviation 1.96, e^2 = degree of precision or accuracy (0.05) $P= 0.438$ level of uptake of cervical cancer screening in Kumbo west district Cameroon is 43.48% (Donatus et al., 2019), $q=1-P= 0.565$. Hence Sample size (n_0) = $(1.96)^2*(0.435)*(0.565)/(0.05) = 378$ participants. After 5% correction a minimum sample size of 400 participants
- Sampling Technique:** A multi-stage sampling technique proportionate to size was employed. First, Kumba was divided into KND and KSD. Then, two health areas were randomly selected from KND and three from KSD using balloting. Next, three communities within each selected health area were randomly selected using balloting. Finally, systematic sampling was used to select households, interviewing every third household. In households with multiple eligible women, the eldest was prioritized. This process was repeated across all five health areas to reach the target sample size of 400 (Table 1).

Table 1 Population Distribution of The Sample Population with Respect to Each Health Area

DITRICT	HEALTH AREA	POPULATION	PROPORTION	SAMPLE POPULATION
KUMBA NORTH	Kumba Pulletine	3539	0.067	25
	Kumba town.	15704	0.3	120
KUMBA SOUTH	Kumba Station	2792	0.052	20
	Fiango	13924	0.262	105
	Kumba mbeng	17251	0.324	130
Total	Total	53210	100	400

Data Collection Tool and Procedure

- Data Collection Tool:** A structured, self-administered questionnaire with closed-ended questions was used. The questionnaire was divided into four sections: sociodemographic characteristics, knowledge of cervical cancer (which involved 11 questions, with each correctly answered question earning a point, sum of points or scores above 7 indicating adequate knowledge), self-reported cervical cancer screening uptake, and factors influencing uptake. Knowledge questions were adapted from previous studies (Donatus et al., 2019; Moshi et al., 2019; Wakwoya et al., 2020). Knowledge was assessed on cervical cancer awareness, it's causes, risk factors, symptoms, transmission, information sources, recommended screening age, and prevention methods.
- Data Collection Procedure:** Permission was obtained from the District Medical Officer. Community health workers accompanied data collectors (nurses with diplomas or BSc degrees). Participants were informed about the study, questions were clarified, and written informed consent was obtained before administering the questionnaire. Data collectors were present during completion to ensure completeness and accuracy.

Validity and Reliability

- Validity:** The questionnaire was reviewed by a gynecologist and an epidemiologist. A pre-test was conducted with 30 women in Konye, and the questionnaire was revised based on the feedback.
- Reliability:** Data collectors received three days of training on the study objectives and ethical principles. Training effectiveness was assessed through Q&A sessions. Daily data was checked for accuracy and completeness.

Data Management

Data was entered into Epi Info version 7.2.5, exported to Microsoft Excel for cleaning, and analyzed using SPSS

version 26. Univariate, bivariate, and multivariate analyses were performed. Variables with p value < 0.2 in bivariate analysis were included in the multivariate analysis. A p-value ≤ 0.05 in the multivariate analysis indicated a strong statistical association with the dependable variable

Ethical Considerations

Ethical approval was obtained from the Institutional Review Board of the Faculty of Health Sciences, University of Buea. Authorization was obtained from the Regional Delegation of Public Health, South West Region, and the District Medical Officers of Kumba North and South. Written informed consent was obtained from all participants.

RESULTS

Socio-Demographic Characteristics

From table 2a: A total of 400 women consented for this study, the mean age and standard deviation of the respondents was 33.78 ± 7.803 . The majority of the participants (64.3%) were in the 25-34 years age group with 32.5% living in Kumba Mbeng Health Area. More than one quarter of the participants were private employees (26.5%), with 23.0% of the participants doing business. More than half (53.0%) of the participants had secondary level education.

Table 2a: Distribution of participants based on socio-demographic characteristics

Variable	Category	Frequency	Percentage (%)
Age (years)	25-34	257	64.3
	35-44	103	25.7
	45-55	25	6.3
	55-65	15	3.7
	Total	400	100.0
Health Area	Fiango	105	26.3
	Kumba mbeng	130	32.5
	Kumba station	21	5.2
	Kumba town	107	26.7
	Pulletine	37	9.3
	Total	400	100
Occupation	Housewife	73	18.3
	Farming	45	11.3
	Business	92	23.0
	Government Employee	26	6.4
	Private Employee	106	26.5
	Student	56	14.0
	Retired	2	0.5
	Total	400	100

Educational level	Primary	77	19.3
	Secondary	212	53.0
	University	111	27.7
	Total	400	100

From table 2b; Majority (61.5%) of the participants were married with more than three quarter (87.5%) being Christians. More than one third (35.7%) of the participants had 2-3 children, with more than two third (66.5%) of the participants visiting the health facility more than once a year. About half of the participants (49.5%) had less than 50.000FRS as average monthly income.

Table 2b: Distribution of participants based on socio-demographic characteristics

Variable	Category	Frequency	Percentage %
Marital Status	Married	246	61.5
	Single	136	34
	Divorce	10	2.5
	Widow	8	2
	Total	400	100
Religion	Christianity	350	87.5
	Muslim	22	5.5
	African tradition religion	25	6.2
	None	3	0.8
	Total	400	100
Number of children	No child	97	24.2
	One child	92	23
	2-3 children	143	35.7
	Greater than 3 children	68	17
	Total	400	100
Average number of times visited hospital	Once a year	113	28.2
	More than once a year	266	66.5
	Never visited a health facility	21	5.3
	Total	400	100
Average monthly income	Less than 50.000	198	49.5
	50.000-100.000	110	27.5
	101.000-150.000	48	12
	Greater than 150.000	44	11
	Total	400	100

Knowledge Of Participants on Cervical Cancer

Table 3 shows that two-thirds (66.5%) of the participants had heard of cervical cancer, with a similar proportion (66.3%) knowing it is a fatal disease. Less than one-third were unaware that cervical cancer can be fatal. Approximately 43% of participants knew that the human papillomavirus (HPV) causes cervical cancer. A large majority (76%) were aware of cervical cancer screening services.

The most common source of information about cervical cancer was healthcare workers (63.8%), followed by the media (15.7%), community workers (9%), friends/relatives (6.6%), and printed materials (4.8%).

A vast majority (85%) of participants knew that screening can detect cervical cancer early. However, only about 43.8% were aware that screening can begin before the age of 20. While 85% knew that cervical cancer screening is available in hospitals, just over two-thirds (68%) understood that cervical cancer is treatable if detected early.

Table 3: Distribution of participants based on knowledge of cervical cancer

Variable	Category	Frequency	Percentage %
Heard of cervical cancer	No	134	33.5
	Yes	266	66.5
	Total	400	100
Cervical Cancer Killer Disease	No	26	6.5
	Yes	265	66.3
	Do not know	109	27.2
	Total	400	100
Cause of cervical cancer	Escherichia Coli	87	21.8
	Human Papilloma Virus	172	43.0
	yeast infection	17	4.3
	Do not know	124	31
	Total	400	100
Awareness of cervical cancer screening services	No	96	24.0
	Yes	304	76
	Total	400	100
Can Cervical Cancer be Detected	No	60	15.0
	Yes	340	85.0
	Total	400	100
Age to begin screening	Less than 20years	175	43.8
	21-40 years	137	34.2
	Above 41 years	13	3.2
	Do not know	75	18.8
	Total	400	100
where is cervical cancer screening done	Hospital	342	85.5
	Pharmacy	40	10.0
	traditional doctor	18	4.5
	Total	400	100
can cervical cancer be treated	Yes	272	68.0
	No	23	5.8
	Do not know	105	26.2
	Total	400	100

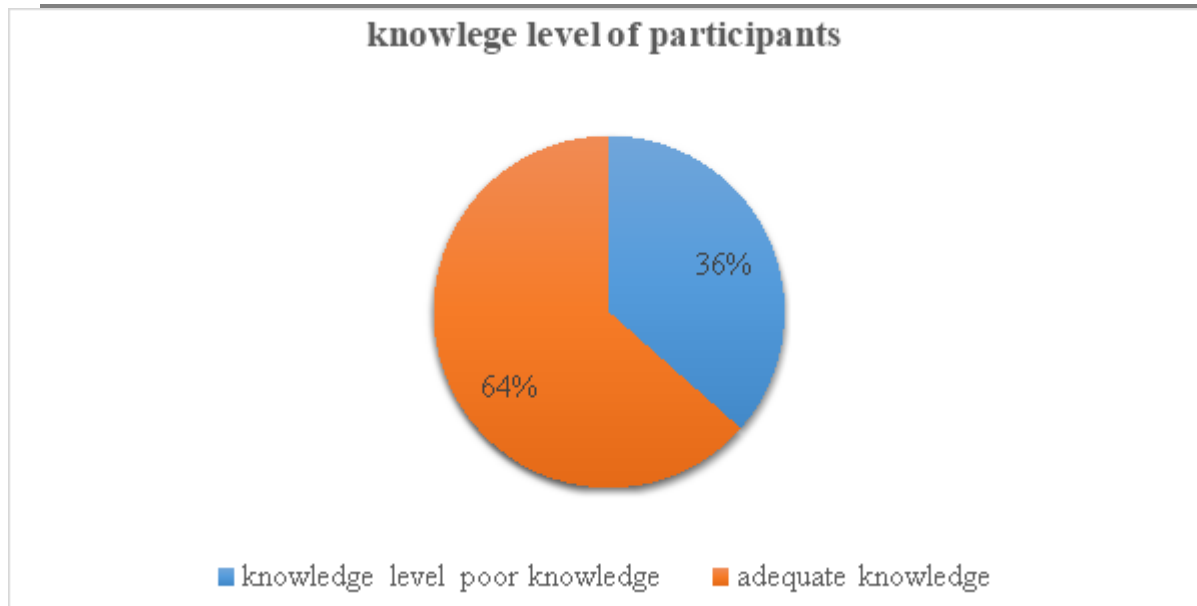


Figure 1: Overall knowledge level of participants on cervical cancer

From figure 1, majority of the participants 64% had adequate knowledge on cervical cancer, its causes, risk factors, signs and symptoms, methods of prevention, where screening is done and the age to start screening, while 36% of the participants had poor knowledge of cervical cancer.

Participants Level of Uptake of Cervical Cancer Screening Service

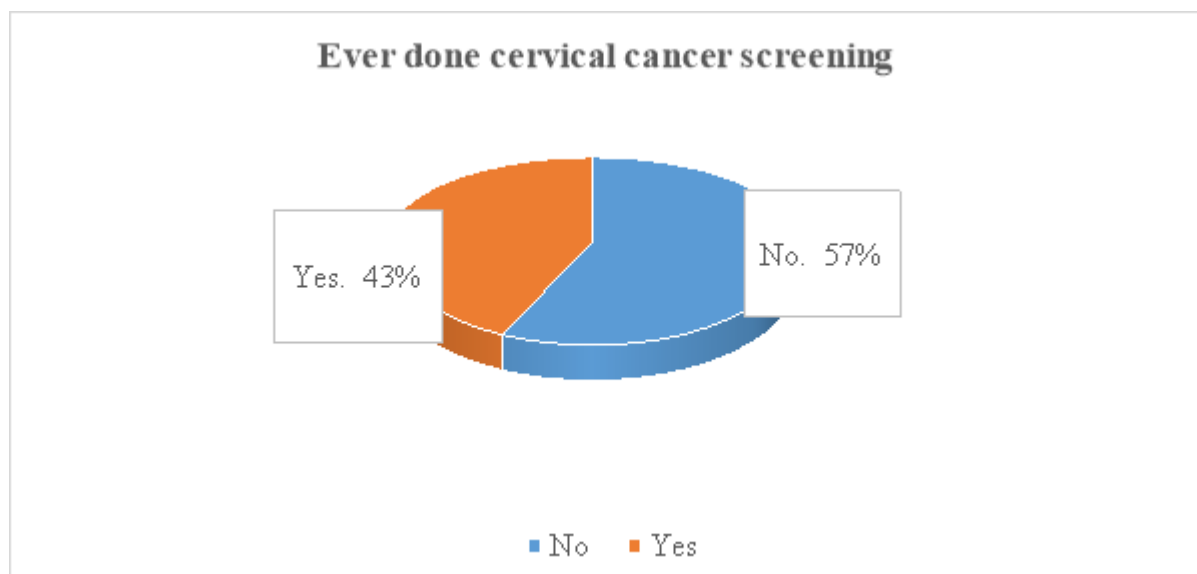


Figure 2: Distribution of participants based on uptake cervical cancer screening.

From figure 2, The level of uptake of cervical cancer screening services in this study was 43%.

Enabling Factors of Cervical Cancer Screening

From table 4a people living in Kumba Town had 2.2 times more chances of doing cervical cancer screening compared to those living in Fiango (COR=2.15; CI:1.24-3.91, p value=0.01). Having adequate knowledge about cervical cancer increases the chances of uptake by 4.5 times (COR=4.45; CI: 2.86-7.27, p value=0.008). Positive attitude increases uptake of cervical cancer screening by 2.39 (COR= 2.39; CI: 1.41-4.40, p value=<0.000). Receiving husband encouragement reduced level of uptake of cervical cancer screening by 0.25 times (COR =0.25 CI: 0.19-0.81, p value=0.007). Living near a health facility increased the chances of uptake of cervical cancer screening services by 2 times (COR= 2.07; CI: 1.27-3.38, p value=0.009). Workers good

attitude turn to reduce the uptake of cervical cancer screening by 0.40 times (COR= 0.40; CI: 0.19-0.81, p value=0.002) less likely to do cervical cancer screening provided. Women who perceived the price of cervical cancer screening affordable were 10 times more likely of doing cervical cancer screening compared to those who did not know about the price of screening (COR= 10.21; CI: 5.96-17.48, p value=<0.000) while women who perceived the price as expensive were more than 7 times (COR= 7.45; CI: 4.18-13.32, p value=<0.000) more likely of doing screening compared to those who did not know the price. Receiving health worker's encouragement increased uptake of cervical cancer by 5 times (COR= 5.45; CI: 3.40-8.74, value=<0.000) compared to those without health worker encouragement. Encouragement from community health workers were increase uptake of cervical cancer screening by 2.29 times (COR= 2.29; CI: 1.53-3.44, p value=<0.000) compared to those who did not receive it.

Table 4a: Bivariate analysis of the association between uptake of cervical cancer screening and socio demographic characteristics

Variable	Parameter	Ever done screening			95% CI	P-value
		No	Yes	COR		
Health Area	Pulletin	4.3	5.0	1.84	0.86-3.91	0.11
	Kumba Town	11.3	15.5	2.15	1.24-3.91	0.01
	Kumba Station	3.3	2.0	0.96	0.37-2.52	0.93
	Kumba Mbeng	22.5	10	0.96	0.40-1.19	0.19
	Fiango (Ref)	16	10.3	1		
Knowledge level	Adequate	28.5	35	4.55	2.68-7.27	<0.008
	Poor (Ref)	28.7	7.8	1		
like to do screening	Yes	41.8	37	2.39	1.41-4.04	<0.000
	No (Ref)	15.5	5.8	1		
Husband encouragement	Yes	10.3	11.8	0.25	0.19-0.81	0.007
	No (Ref)	24.5	37	1		
Nearby health facility	Yes	40.3	35.5	2.07	1.27-3.38	0.009
	No (Ref)	17	7.2	1		
Good attitude of staff	Yes	7	3	0.4	0.19-0.81	0.002
	No (Ref)	30	32.5	1		
Cost of screening	Affordable	11	22	10.21	5.96-17.48	<0.000
	expensive	9.3	13.5	7.45	4.18-13.27-	<0.000
	Do not know (Ref)	37	7.2	1		
Health care worker encouragement	Yes	26.5	35.7	5.45	3.40-8.74	<0.000
	No (Ref)	30.8	7	1		
Community health worker encouragement	Yes	24.5	27	2.29	1.53-3.44	<0.000
	No (Ref)	32.8	15.7	1		

From table 4b, having 2-3 children increases the uptake of cervical cancer screening by 3 times (COR=2.96; CI: 1.71-5.12, p value= 0.005), having relatives who did cervical cancer screening increased the uptake of cervical cancer screening by 6 times (COR= 6.16; CI: 3.98-9.54, p value=0.006). Feelings of having signs/symptoms of cervical cancer screening increase the uptake by 2 times (COR= 2.22; CI: 1.24-3.57, p value=0.01).

Table 4b: Bivariate analysis of the association between uptake of cervical cancer screening and socio-demographic characteristics

Variable	Category	Done screening (%)		COR	CI (95%)	P value
		No	Yes			
Number of children	greater than 3 children	10.2	6.7	1.62	0.84-3.12	0.411
	2-3 children	16.3	19.5	2.96	1.71-5.12	0.005
	one child	13.5	9.5	1.73	0.95-3.17	0.072
	no child (Ref)	17.3	7	1		
relative did screening	Yes	15.5	29.7	6.16	3.98-9.54	0.002
	No (Ref)	41.8	13	1		
attended community outreach program	Yes	9.8	13.8	2.31	1.44-3.70	0.006
	No (Ref)	47.5	29	1		
feelings of having signs and symptoms	Yes	7.3	10	2.11	1.24-3.57	0.01
	No (Ref)	50	32.7	1		

Determinants of Uptake of Cervical Cancer Screening

For controlling of confounders, the following variables were included in the multivariate analysis to determine the Factors associated with the uptake of cervical cancer screening services: health area, age, knowledge level, attitude for screening, nearby health area, husband encouragement, relative who did screening, cost of screening, number of children, feelings of signs and symptoms of cervical cancer, average monthly income and attended an outreach program.

From table 6a, after the potential confounders were controlled the independent factors positively affecting the uptake of cervical cancer were women living in Pulletin Health Area (AOR =3.03, CI=1.02-8.99, p value=0.050) and Kumba Town Health Area (AOR=2.55, CI=1.20-5.44, p value=0.023), having age between 35-44 years (AOR=1.96 CI=1.03-3.71, p value=0.041), adequate knowledge (AOR=2.96, CI=1.56-5.59), having a relative who did screening (AOR 3.82, CI=2.08-7.00, p value=<0.000).

Table 6 a: Independent determinants associated with uptake cervical cancer screening

Variable	Category	Done screening (%)		AOR	95%CI		P value
		No	Yes		Lower	Upper	
Health Area	Pulletin	4.3	5	3.03	1.02	8.99	0.050
	Kumba town	11.3	15.5	2.55	1.12	5.44	0.023
	Kumba Station	3.3	2	0.72	0.2	2.58	0.624
	Kumba Mbeng	22.5	10	0.8	0.39	1.64	0.546
	Fiango	16	10.3	1	.	.	.
Age	55-65years	4.8	23	1.56	0.34	7.18	0.573
	45-54years	6.1	6.4	2.76	0.84	9.09	0.997
	35-44years	18.3	3.57	1.96	1.03	3.71	0.041
	25-34years	70.7	55.6	1	.	.	.

Knowledge level	Adequate	28.5	35	2.96	1.56	5.59	0.003
	Poor	28.7	7.8	1	.	.	.
Like to do screening	Yes	41.8	37	0.53	0.26	1.07	0.071
	No	15.5	5.8	1			
Nearby health facility	Yes	10.3	11.8	1.3	0.88	1.33	0.82
	No	24.5	37	1	.	.	.
husband encouragement	Single	22.5	11.5	0.49	0.24	1.00	0.050
	No	24.5	37	0.47	0.23	0.97	0.042
	Yes	10.3	11.8	1	.	.	.
relative did screening	Yes	15.5	29.7	3.815	2.079	7	0.000*
	No	41.8	13	1	.	.	.

From table 6b death of a love one negatively affected uptake of cervical cancer (AOR=0.31, CI=0.21-0.76, p value=0.01), not knowing the cost of cervical screening negatively affects the uptake of cervical cancer screening (AOR=0.21, CI=0.10-0.42, p value=<0.000). Having average income of greater than 150.000 had a negative effect on the uptake of cervical cancer screening (AOR=0.366, CI=0.14-0.91, p value=0.03)

Table 6 b: Independent determinants associated with uptake cervical cancer screening

Variable	Category	ever done screening %			95% CI		P Value
		No	Yes	AOR	Lower	Upper	
Death of a love one	yes	6.25	5.75	0.31	0.12	0.76	0.01*
	No	51	37	1	.	.	.
Cost of screening	don't know	37	7.2	0.21	0.1	0.42	≤0.00*
	Expensive	9.3	13.5	0.38	1.49	0.41	
	Affordable	11	22	1	.	.	.
Number of children	greater than 3	10.2	6.7	2.02	0.76	5.38	0.16
	2-3 children	16.3	19.5	2.65	1.22	5.74	0.01*
	one child	13.5	9.5	2.49	1.1	5.65	0.03*
	no child	17.3	7	1	.	.	.
Feelings of signs and symptoms	Yes	7.3	10	2.05	0.97	4.35	0.06
	No	50	32.7	1	.	.	.
Average monthly Income	Greater than 150.000	13	3.5	0.36	0.14	0.91	0.03*
	101.000-150.000	12.2	5	0.81	0.33	1.95	0.63
	50.000-100.000	25.3	13	1.55	0.8	2.99	0.19
	less than 50.000	49.3	25	1	.	.	.
Attended outreach program	yes	9.8	13.8	1.53	0.79	2.98	0.21
	No	47.5	29	1	.	.	.

DISCUSSION

This study investigated the determinants of cervical cancer screening uptake among women aged 25-65 in Kumba. The discussion is structured around the study's objectives.

Knowledge of Participants about Cervical Cancer:

Overall knowledge of cervical cancer was adequate at 64%, contrasting with other studies reporting poor knowledge (Mbaka et al., 2018). This higher knowledge level may be attributed to effective health education by healthcare personnel and community health workers, frequent hospital visits, and accessible health facilities. This finding aligns with a study in Kumbo (Donatus et al., 2019) but differs from Simo et al. (2021), who found that most participants had never heard of cervical cancer. These differences likely stem from variations in socio-demographic characteristics and health education levels. Despite the relatively high knowledge level, some women remain unaware, highlighting the need for continued education, emphasizing risk factors, signs and symptoms, prevention methods, and screening locations.

Level of Uptake of Cervical Cancer Screening:

Cervical cancer screening uptake was low at 43%, compared to the WHO's 70% recommendation. While this represents a promising uptake due to increased awareness, it still requires improvement. Studies suggest that poor knowledge is a major barrier to screening (Mbaka et al., 2018), emphasizing the importance of ongoing education through various channels. This study's uptake rate is similar to studies in Southeast Ethiopia and Kumbo (Donatus et al., 2019; Gizaw et al., 2022) but higher than studies in Ambo Town, Central Uganda, and Zimbabwe (Natae et al., 2021; Isabirye et al., 2022, 2020), which attributed low uptake to poor knowledge. Conversely, it's lower than a study in Eastern Ethiopia (Tesfaye et al., 2023), where high knowledge levels, due to awareness campaigns, led to higher uptake.

Determinants of Uptake of Cervical Cancer Screening Services:

- **Health Area:** Women in Kumba Town and Pulletin were more likely to be screened than those in Fiango, possibly due to proximity to screening facilities (KBH and Regional Hospital Kumba) and those health areas are in the urban settings. This aligns with studies in Southwest Ethiopia and West Ethiopia (Gizaw et al., 2022), which showed increased uptake with shorter distances to health facilities and in urban areas (Rawlence et al., 2016).
- **Age:** Women aged 35-44 were more likely to be screened than those aged 25-34. This may be due to symptomatic irregular bleeding experience women experience make them to perceive themselves at risk of cervical cancer. This is consistent with studies in West Ethiopia and Ambo Town (Akokuwebe et al., 2021; Gizaw et al., 2022; Natae et al., 2021), but contrasts with a study in Josua O. et al. (Okoyere et al., 2021) which found higher uptake in younger women.
- **Knowledge:** Adequate knowledge of cervical cancer was associated with a threefold increase in screening uptake. This highlights the importance of sensitization and education by healthcare personnel and community health workers. This aligns with studies in Eastern Ethiopia, Oromia Ethiopia, and Myanmar (Nandar & Laosee, 2015; Natae et al., 2021; Tesfaye et al., 2023).
- **Husband Encouragement:** Lack of husband encouragement was negatively associated with screening uptake. This highlights the need for male involvement in promoting women's health. This finding supports a study in Addis Ababa, which identified lack of husband encouragement as a barrier (Hussein et al., 2024).
- **Death of a Loved One:** Experiencing the death of a loved one may negatively impact screening uptake due to misconceptions about screening leading to mortality. Addressing these misconception are crucial to uptake of cervical cancer screening.
- **Cost of Screening:** Not knowing the price of screening was negatively associated with uptake, likely due to assumptions of high cost. Transparency about costs and highlighting the cost-effectiveness of screening are essential.

- **Relatives' Screening Status:** Having relatives who had been screened was positively associated with screening uptake, suggesting the influence of social networks and shared experiences.
- **Parity:** Having one or two to three children was positively associated with screening uptake, possibly due to increased interaction with healthcare providers during routine visits. This aligns with a study in Oromia Ethiopia (Gizaw et al., 2022) but differs from studies in Malawi and Ambo Town (Natae et al., 2021; Tadesse et al., 2023), which showed increased uptake with more deliveries. These differences may be due to variations in research methods.
- **Income:** Surprisingly, higher income was negatively associated with screening uptake. This is explained by the fact that most women with higher income were in between the ages of 25-34 years making them believe they are less likely of having cervical cancer as they consider it as a disease of the old. Targeted interventions are needed for this group. This contrasts with a study in Latin America, which found a positive association between wealth and screening (77).

Study Strengths and Limitations:

Study strength; The cross-sectional design allowed assessment of various factors influencing screening uptake of cervical cancer.

Study limitation, the study could not establish cause and effect relationship due to its one-point-in-time nature. Recall bias and selection bias (prioritizing elderly women in a household of two women) is also a potential limitation of this study. Generalizability may be limited due to the focus on five urban health areas in Kumba. Information bias related to self-reporting is also possible.

CONCLUSION

While knowledge of cervical cancer is relatively high in Kumba, uptake of screening remains low compared to WHO targets. Continuous education about risk factors, symptoms, and screening locations is crucial. Enabling factors include living in specific health areas, being a private employee, having children, adequate knowledge, positive attitudes, proximity to facilities, perceived affordability, healthcare worker encouragement, having screened relatives, and experiencing potential symptoms. Determinants include age, parity, knowledge, marital status, and having screened relatives. Addressing misconceptions, promoting male involvement, ensuring cost transparency, and developing targeted interventions for specific groups are vital for increasing screening uptake and achieving WHO goals for cervical cancer elimination.

RECOMMENDATIONS

The government through the ministry of public health should increase the number of cervical cancer screening facilities in Kumba and reduce the price of screening, with the amount made known to the public.

Health personnel and community health workers should actively sensitize the Kumba population about cervical cancer screening using available media such as radio, television, social media and bill boards. Health facilities should periodically organize free cervical cancer screening campaigns

Screened relatives and friends should always share their experiences about the screening process to the unscreened relatives. This serves as positive reinforcers for cervical cancer screening.

List of abbreviations

Q&A	Questions and Answers
AOR	Adjusted Odd Ratio
CI	Confidence Interval
COR	Crude Odd Ratio
DNA	Deoxyribonucleic acid
HPV	Human papilloma virus

KND	Kumba North District
KSD	Kumba South District
VIA	Visual inspection with Acetic Acid
VILLI	Visual inspection with Lugol's Iodine

Declarations

This work is original, with all used sources properly cited and referenced with genuine data collected

No conflict of interest existed in this work

Consent for publication

Not Applicable.

Availability of data and materials

The data set generated and analyzed in this study, are available from the corresponding author on reasonable request.

Competing interest

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