

Determinants of acceptability of cervical cancer screening among women of reproductive age in the Kalamu 1 Health Zone, Kinshasa, Democratic Republic of the Congo

Aloma, G. A.¹, Ngwamah, A. F. B.¹, Mawunu, M.², Mbungu, R. M.³, Ngbolua, K. N.^{4,5}, Omanyondo, M. O.¹, & Wembodinga, G. U.⁶

¹Doctoral School in Health Sciences, Higher Institute of Medical Techniques of Kinshasa, Kinshasa, Democratic Republic of the Congo

²Polytechnic Institute of Kimpa Vita University, Angola

³Department of Gynecology and Obstetrics, University Clinics of Kinshasa, University of Kinshasa, Kinshasa, Democratic Republic of the Congo

⁴Department of Biology, Faculty of Science and Technology, University of Kinshasa, Kinshasa, Democratic Republic of the Congo

⁵Center for Research in Pharmacopoeia and Traditional Medicine, Higher Institute of Medical Techniques, Kinshasa, Democratic Republic of the Congo

⁶School of Public Health, Faculty of Medicine, University of Kinshasa, Kinshasa, Democratic Republic of the Congo

ARTICLE INFO

Received: 06 October 2024

Accepted: 08 November 2024

Published: 15 November 2024

Keywords:

Cervical cancer awareness, screening barriers, health service access, screening acceptability, reproductive health

Peer-Review: Externally peer-reviewed

© 2024 The Authors.

Re-use permitted under CC BY-NC 4.0
No commercial re-use or duplication.

Correspondence to:

Prof. Koto-Te-Nyiwa Ngbolua
jpngbolua@unikin.ac.cd

To cite:

Aloma, G. A., Ngwamah, A. F. B., Mawunu, M., Mbungu, R. M., Ngbolua, K. N., Omanyondo, M. O., & Wembodinga, G. U. (2024). Determinants of acceptability of cervical cancer screening among women of reproductive age in the Kalamu 1 Health Zone, Kinshasa, Democratic Republic of the Congo. *Orapuh Journal*, 5(6), e1157
<https://dx.doi.org/10.4314/orapi.v5i6.57>

ISSN: 2644-3740

Published by [*Orapuh, Inc.*](http://Orapuh, Inc. (info@orapuh.org)) (info@orapuh.org)

Editor-in-Chief: Prof. V. E. Adamu
Orapuh, Inc., UMTG PMB 405, Serrekunda, The Gambia, editor@orapuh.org.

ABSTRACT

Introduction

Cervical cancer is primarily associated with persistent infections by specific oncogenic human papillomaviruses (HPV), which can cause cellular changes leading to precancerous and cancerous conditions. Screening is crucial for detecting precancerous lesions, enabling early interventions to prevent cancer progression.

Purpose

This study aims to identify the determinants influencing the acceptability of cervical cancer screening among women of reproductive age (18-49) in the Kalamu 1 Health Zone, Kinshasa.

Methods

A quantitative, cross-sectional, descriptive study was conducted using the Fisher exact formula, a population of over 10,000 in the Kalamu 1 Health Zone. A total of 415 women were surveyed between August 20 and September 4, 2019, using a semi-structured questionnaire. Logistic regression analysis was employed to assess the relationship between various factors and screening acceptability.

Results

The average age of respondents was 28 ± 7 years. Logistic regression identified key determinants affecting screening acceptability. A low level of education was significantly correlated with reduced acceptability (odds ratio: 8.91; 95% CI [1.46-35.27]; $p = 0.01$), indicating that less-educated women are about nine times less likely to accept screening. Women unaware of cervical cancer were also significantly less likely to participate (odds ratio: 19.30; 95% CI [9.13-35.20]; $p = 0.00$), highlighting a strong link between lack of knowledge and refusal. Additionally, the distance from home to the screening center emerged as a major barrier (odds ratio: 22.87; 95% CI [8.10-60.47]; $p = 0.00$), with those living farther away nearly 23 times less likely to accept screening. These results underscore the need for enhanced awareness programs and improved access to screening services, especially in remote areas.

Conclusion

Targeted public health interventions are essential for improving cervical cancer screening uptake. Educational programs must increase awareness about cervical cancer and the importance of early screening, particularly among women with limited formal education. Expanding the geographic accessibility of screening services could address significant barriers, enhancing participation and contributing to better prevention and early detection of cervical cancer within the community.

INTRODUCTION

Cervical cancer, primarily caused by chronic infection with oncogenic human papillomaviruses (HPV), poses a significant global public health challenge. In 2018, approximately 570,000 new cases and an estimated 312,000 deaths were attributed to this disease, making it the fourth most common cancer among women, with a standardized incidence rate of 6.0 per 100,000 person-years (Cancer Info, 2019). The World Health Organization (WHO) similarly ranks cervical cancer as a leading cause of cancer, attributing it to 6.6% of cancer cases and related mortality (World Health Organization [WHO], 2018). In industrialized countries, organized cervical cancer screening programs have led to a steady decline in incidence and mortality over the past 50 years. For instance, in Europe, invasive cervical cancer incidence rates varied from 4.7 per 100,000 women in Finland to 28.4 per 100,000 in sub-Saharan Africa (Denny & Ngan, 2006).

In the Democratic Republic of the Congo (DRC), cervical cancer is the most prevalent gynecological cancer, with mortality rates between 80% and 90%, primarily due to late-stage diagnoses (Afro Congo, 2024). Despite being a preventable disease, insufficient screening results in higher mortality than breast cancer and communicable diseases such as tuberculosis and malaria (MONUSCO, 2019). The effectiveness of screening programs is often hindered by socioeconomic barriers, including low education and income levels, which limit access to necessary healthcare services (Institute for Research and Documentation in Health Economics [IRDES], 2018).

Additionally, the healthcare infrastructure in Kinshasa, which includes limited access to organized screening initiatives, exacerbates these challenges. Many existing programs fail to reach marginalized populations, resulting in low participation rates. Studies have shown that a lack of effective cervical cancer control programs and insufficient training for healthcare providers significantly correlate with low screening participation and high disease incidence in regions like Senegal (Méd. Presse, 2003).

Given this context, there is a notable gap in the literature concerning the determinants of cervical cancer screening acceptability among women in Kinshasa's Kalamu 1

Health Zone. This study aims to fill this gap by exploring the specific factors that influence women's willingness to participate in cervical cancer screening. By identifying these determinants, our research seeks to inform the development of targeted public health interventions that could enhance screening rates and improve health outcomes for women in the DRC. Addressing this issue is crucial, as systematic and well-organized screening programs could significantly mitigate the burden of cervical cancer in this region.

METHODS

Presentation of Health Zone

This study was conducted in the Kalamu Health Zone, divided into two sectors, including Kalamu 1, which comprises 10 health areas with healthcare facilities dedicated to implementing primary healthcare policies. Located near Kinshasa's centre, this cosmopolitan district is characterized by vibrant demographic, commercial, and cultural activities that attract a diverse population. Notably, many of the residents belong to the working class and rely on subsistence livelihoods. Kalamu 1 was chosen for this study due to its representative demographic diversity, which reflects the socio-economic and cultural composition of Kinshasa. This zone includes groups from various socio-economic backgrounds and women of different age ranges, providing a solid foundation for examining determinants of cervical cancer screening acceptability. The selection was also influenced by the accessibility of local healthcare infrastructure, enabling inclusion of perspectives from a broad spectrum of women with both direct and indirect access to health services.

Population Studied and Sampling

The study population included all women residing in the Kalamu 1 Health Zone, within the City Province of Kinshasa. A three-stage probability sampling technique was utilized to identify a subgroup that met the inclusion criteria. In the first stage, five health areas within Kalamu 1 Health Zone were randomly selected using simple random sampling without replacement (see Table 1 for stratification details). In the second stage, 25 streets from the chosen health areas were drawn using the same random sampling method. The sampling fraction (n/N) was applied to select a proportional number of streets according to each health area's sample size. This three-

stage random sampling technique was chosen to enhance representativeness and reduce biases associated with non-probability sampling, involving initial stratification by neighborhood, followed by random selection of households, and finally, random selection of participants within each household. This structured approach helped ensure a representative sample at the health zone level and mitigated risks of overrepresentation from specific groups (Labama, 2006).

Table 1 displays the stratification of participants by health area within Kalamu 1 Health Zone:

Table 1:
Stratification of Participants by Health Area in Kalamu 1 Health Zone

Health Area	Total Population	Proportion	No. of Participants
Matonge 3	16,973	0.19	79
Kauka 3	10,820	0.12	50
Matonge 1	16,922	0.19	79
Matonge 2	19,515	0.22	91
Kimbangu 1	24,952	0.28	116
TOTAL	89,182	1	415

Note: Proportion = (Population by health area) / (Total population of health areas selected). The number of respondents per health area was determined based on the total sample size (415 women), with specific streets and avenues selected in each area by random drawing (Amuli et al., 2010).

Bias Control

To minimize biases, inclusion and exclusion criteria were established to ensure sample homogeneity. Eligible participants were women aged 22 to 54 years, residing on selected streets within Kalamu 1 Health Zone, and present during the study period. Participants provided signed informed consent before taking part. Exclusion applied to women who did not meet these criteria. A multi-stage random sampling technique was applied to ensure representativeness and reduce selection bias, with proportional quotas maintained among socio-economic and age subgroups. Surveyors received thorough training to mitigate interviewer bias, using detailed guides to standardize data collection. Confounding variables such as education level and access to healthcare services were adjusted during statistical analysis to better reflect the true relationship between determinants and screening acceptability.

The sample size of 415 respondents was calculated based on the estimated female population over 10,000 using the Fisher formula:

$$n \geq \frac{z^2pq}{d^2}$$

Study Type and Paradigm

This research utilized a quantitative, descriptive, cross-sectional design with explanatory aims, conducted from August 20 to September 4, 2019, focused on women aged 22 to 54 in the Kalamu 1 Health Zone of Kinshasa. The hypothetico-deductive paradigm guided the study, employing a survey to gather information regarding factors influencing cervical cancer screening acceptability among the sampled women.

Data Collection

A pilot study, conducted from June 21 to August 24, 2018, refined the data collection instrument. The pilot targeted a similar demographic to the main study population, identifying improvements needed in the questionnaire. A semi-structured interview technique was used, with a questionnaire including both closed and open-ended questions. This questionnaire was administered in three copies: one for the selected women, another for the Kalamu 1 Health Zone management staff, and the third for head nurses of local health centers. Questions for the women focused on socio-demographic and cultural characteristics, awareness of cervical cancer and screening, acceptability of screening, and accessibility to health services. Replacement participants were chosen for those absent or reluctant to participate.

Statistical Data Analysis

Data were entered in Excel and analyzed with SPSS version 22.0 and EPI-INFO version 3.5.4. Bivariate analysis explored relationships between the dependent variable (screening acceptability) and various independent variables using the chi-square test at $p < 0.05$. Logistic regression identified independent factors associated with screening acceptability, controlling for confounding variables. Odds ratios with 95% confidence intervals were calculated to assess the likelihood of non-acceptance of screening. A final multivariate logistic regression model identified determinants predicting screening acceptability. While the study had strong internal validity for Kalamu 1

Health Zone, external validity is limited due to restricted generalizability to Kinshasa or the DRC.

Ethical Considerations

Ethical approval was granted by the DRC Ministry of Health's National Health Ethics Committee (certificate no. 98/CNES/BN/PMME/2019, August 10, 2019). Informed consent forms explained the study's objectives, ensuring participants' anonymity and confidentiality. Participants could withdraw at any point without consequence, though none chose to do so.

RESULTS

The socio-demographic profile of respondents is given in **Table 2**.

The sociodemographic data on the determinants of acceptability of cervical cancer screening among women (**Table 2**) reveals significant insights with important public health implications. A majority of participants (52%) are under 28 years old, suggesting that screening initiatives should target this younger demographic, who may lack awareness about cervical cancer risks and the benefits of screening. Additionally, 26.3% of respondents are illiterate, and 35.7% have only primary education, indicating a need for health literacy improvement through accessible educational programs. With 53.3% of women being single, social dynamics regarding healthcare access may vary, necessitating tailored outreach for different marital statuses. The predominance of monogamous relationships (78.9%) could influence health-seeking behaviors, while the diverse religious affiliations (predominantly Catholic at 28.7% and Protestant at 35.7%) suggest that cultural beliefs may impact screening acceptance; engaging religious leaders in awareness campaigns could be beneficial. The data also shows that 64.6% of women report a daily expenditure below 10,000 FC, reflecting low economic status, and 47% belong to a low socioeconomic group, highlighting economic constraints as barriers to healthcare access. Furthermore, the prevalence of homemakers (39.5%) suggests that mobility and time to seek medical care may be limited, warranting flexible screening options like mobile clinics or community outreach. Overall, these sociodemographic factors indicate a complex interplay of influences affecting cervical cancer screening acceptability, and public health interventions

must be multifaceted, addressing educational gaps, economic barriers, and logistical challenges to enhance uptake among women in this health zone.

Table 2:
Sociodemographic profile of the respondents

Variables	Frequency	%
1. Age		
< 28 years	216	52.0
≥ 28 years	199	48.0
Average [SD]	28.3 [±7.0]	
Median [Min, Max]	28.0 [15 ; 46]	
Total	415	100.0
2. Education level		
Illiteracy	109	26.3
Primary	148	35.7
Secondary	98	23.6
University	60	14.4
Total	415	100.0
3. Marital status		
Single	221	53.3
Married	194	43.1
Total	415	100.0
4. Matrimonial regime		
Monogamous	153	78.9
Polygamous	41	21.1
Total	194	100.0
5. Religion		
Catholic	119	28.7
Protestant	148	35.7
Pentecostal church	95	22.9
Muslim	37	8.9
Undetermined	16	3.8
Total	415	100.0
6. Nationality		
Congolese (DRC)	351	84.6
Foreign	8	1.9
Not determined	56	13.5
Total	415	100.0
7. Woman's job		
Student	82	19.8
Housewife	164	39.5
Civil servant	51	12.3
Private employee	53	12.8
Military	34	8.2
Trader	31	7.5
Total	415	100.0
8. Husband's profession		
Student	17	8.8
Housewife	28	14.4
Civil servant	59	30.4
Private employee	30	15.5
Military	13	6.7
Trader	47	24.2
Total	194	100.0
9. Daily costs		
< 10,000 CF	268	64.6
≥ 10,000 CF	147	35.4
10. Socio-economic status		
High	79	19.0
Medium	141	34.0
Low	195	47.0
Total	415	100.0

Note: CF = Congolese francs

Table 3:
Respondents' knowledge of the UCC

Variables	Frequency	%
Have heard of the UCC		
Yes	193	46.5
No	222	53.5
Total	415	100.0
Knowing that a woman can catch this disease (UCC)		
Yes	322	77.6
No	93	22.4
Total	415	100.0
Information source		
Health centres	99	51.0
Radio	17	9.0
Television	31	16.0
School	45	23.0
Related sources	2	1.0
Total	193	100.0
Ever seen a woman with UCC		
Yes	123	29.6
No	292	70.4
Total	415	100.0
If yes, status of the woman seen with UCC		
Family member	14	11.4
Neighbour	46	37.4
Friend	63	51.2
Total	123	100.0

Table 3 presents the knowledge of participants regarding cervical cancer screening (CCU) among women in the study. The data indicates that only 46.5% of respondents have heard of CCU, revealing a concerning lack of awareness among the majority (53.5%). Despite this, a significant portion (77.6%) understands that a woman can contract this disease, suggesting some level of awareness about the disease itself, even if awareness of screening is low. The primary source of information for those who have heard of CCU is health centers, cited by 51% of respondents, while other sources like radio (9%), television (16%), and school (23%) are less frequently mentioned. This highlights the crucial role of healthcare facilities in disseminating information about cervical cancer. Additionally, only 29.6% of participants have personally seen a woman with CCU, which may contribute to the stigma or lack of urgency in addressing cervical cancer within the community. Among those who have seen a woman with CCU, the majority identified her as a friend (51.2%), followed by neighbors (37.4%) and family members (11.4%), indicating that personal connections may influence perceptions and understanding of the disease. Overall, the findings from **Table 3** underscore the need for enhanced awareness campaigns focusing on cervical cancer screening to increase knowledge and

encourage proactive health-seeking behaviors among women in this population.

Table 4:
Perception of the Disease

Variables	Frequency	%
Being afraid of this illness		
Yes	362	87.2
No	53	12.8
Total	415	100.0
UCC is a disease		
Serious/Mortal	366	88.2
Less serious	36	8.7
Simple or temporary	13	3.1
Total	415	100.0

Table 4 provides insights into participants' perceptions of cervical cancer (UCC). The data reveals that a significant majority of women (87.2%) express fear of this disease, indicating a high level of concern within the community. Additionally, 88.2% of respondents perceive UCC as a serious or fatal illness, while only 8.7% consider it less serious and a small fraction (3.1%) view it as mild or temporary. This strong perception of severity suggests that women may be more open to preventive measures and screenings if awareness campaigns address both the gravity of the disease and the availability of screening services. Given the prevalent fear and acknowledgment of the potential severity of UCC, public health strategies should leverage these perceptions to promote early detection and encourage women to seek timely screening. This data emphasizes the importance of continued efforts to raise awareness, reduce stigma, and provide accessible healthcare resources for cervical cancer screening.

Table 5 highlights participants' knowledge regarding cervical cancer screening. Only 36.4% of respondents are aware of screening, while a majority (63.6%) lack any knowledge of it. Among those informed, most (70.9%) received information from health centers, followed by television (25.1%) and radio (4.0%). However, knowledge about facilities providing screening is notably low, with only 15.4% aware of such structures, while 84.6% are unaware. Despite limited awareness, 31.1% of participants have undergone screening, although a majority (68.9%) have not. These findings suggest an urgent need for expanded public health efforts to increase awareness of cervical cancer screening, particularly by promoting

information through various media channels and strengthening outreach in health centers. Enhancing knowledge about available screening facilities could significantly improve screening uptake, leading to earlier detection and better health outcomes for women.

Table 5:
Respondents' Knowledge of UCC Screening

Variables	Frequency	%
Getting the idea about screening		
Yes	151	36.4
No	264	63.6
Total	415	100.0
Information Source		
Health centres	107	70.9
Radio	6	4.0
Television	38	25.1
Total	151	100.0
Know the structures that organize screening		
Yes	64	15.4
No	351	84.6
Having already been screened		
Yes	129	31.1
No	286	68.9
Total	415	100.0

Table 6 provides insight into participants' attitudes toward cervical cancer screening. Among those screened, 57.4% expressed a desire to know the results before the procedure, indicating a high level of engagement with the outcome. Most participants (74.4%) reported undergoing screening only once, while 25.6% were screened more than once, suggesting room for improved follow-up. When it comes to motivation for screening, over half (55.0%) took the initiative themselves, whereas 21.7% were encouraged by a gynecologist, 14.8% by a midwife, and 8.5% by a nurse, reflecting the influence of healthcare providers. For those who had not been screened, the majority (69.2%) indicated that they would prefer to seek consultation in a hospital, with fewer favoring private clinics (22.1%), health centers (5.9%), or health posts (2.8%). If diagnosed with cervical cancer, 92.8% of respondents expressed a willingness to seek immediate care, and the remaining 7.2% would seek it soon after diagnosis, highlighting a proactive approach toward treatment. Regarding wait times for hospital consultations or screenings, the majority (53.0%) reported a wait of two hours, 30.0% waited three hours, while 8.5% each experienced either one hour or over four hours. These findings underscore the need for streamlined screening processes to reduce waiting times and enhance access, which could improve the uptake and

frequency of screening, supporting early detection and timely intervention.

Table 6:
Attitudes Towards Screening

Variables	Frequency	%
Get an idea of the results before screening		
Yes	74	57.4
No	55	42.6
Total	129	100.0
Number of tests		
Once	96	74.4
More than once	33	25.6
Total	129	100.0
Person who prompted to go for a consultation		
Only	71	55.0
Gynecologist	28	21.7
Midwife	19	14.8
Nurse	11	8.5
Total	129	100.0
If not screened, place planned for consultation		
Hospital	198	69.2
Private practice	63	22.1
Health centre	17	5.9
Health post	8	2.8
Total	286	100.0
Attitudes to adopt in the event of a positive diagnosis of UCC		
Immediately	385	92.8
Early	30	7.2
Total	415	100.0
Time lost waiting for consultation/screening in hospital		
1 hour	11	8.5
2 hours	68	53.0
3 hours	39	30.0
≥ 4 hours	11	8.5
Total	129	100.0

Table 7:
Geographical Accessibility

Variables	n	%
Distance from the health centre		
Away	379	91.3
Near	36	8.7
Total	415	100.0
Getting there by public transport		
On foot	104	25.1
Motorbike or car	311	74.9
Total	151	100.0

Table 7 shows data on geographic accessibility to health centers for cervical cancer screening. A significant majority (91.3%) of respondents indicated that their nearest health center is far, while only 8.7% reported living close by. This distance likely poses a barrier to accessing regular screening services. Additionally, 74.9% of respondents rely

on motorized transportation (either motorcycles or vehicles) to reach the health center, while 25.1% travel on foot. The reliance on transportation, combined with the distance to health centers, highlights potential accessibility issues that may deter women from seeking timely screening. Improving geographic accessibility by increasing the number of local health centers or providing mobile screening units could enhance access and encourage more consistent participation in cervical cancer screening programs, ultimately benefiting public health by facilitating early detection.

Table 8:
Affordability

Variables	Frequency	%
Judgement of transport costs		
Affordable	143	34.5
Expensive	272	65.5
Total	415	100.0
Transport charges		
< 5000 CF	21	5.1
≥ 5000 CF	394	94.9
Total	415	100.0
Assessment of consulting fees		
Affordable	77	18.6
Expensive	338	81.4
Total	415	100.0
Consultation fees		
≥ 5000 CF	31	16.0
≥ 10 000 CF	45	23.0
≥ 20 000 CF	2	1.0
Total	415	100.0
Have seen a woman with UCC		
Yes	123	29.6
No	292	70.4
Total	415	100.0
Individual or legal entity paying the consultation fees		
Association/Mutual	43	11.4
Company/ Employer	83	37.4
Household income	46	51.2
Myself	243	
Total	415	100.0
Fear of being consulted about bill payment		
Yes	298	71.8
No	117	28.2
Total	415	100.0

Note: CF = Congolese Francs

Table 8 examines the financial accessibility of cervical cancer screening services, highlighting several cost-related barriers. The majority (65.5%) of respondents consider transportation costs to health centers as expensive, with 94.9% spending at least 5,000 FC for transport, a significant amount in this context. Similarly, 81.4% of women view consultation fees as costly, and only 18.6% find these fees affordable. The breakdown shows that most consultation fees range from 5,000

Table 9:
Relationship between socio-demographic parameters and non-acceptability for UCC screening

Characteristics	Screening for cervical cancer	OR	CI95%	χ ²	P-value
No (%)	Yes (%)				
Age					
< 28 years	26.6	13.9	0.4	[0.2-0.7]	8.08
≥ 28 years	73.4	86.1			
Level of education					
Illiterate and primary	32.5	48.0	1.8	[1.2-2.8]	8.30
Secondary and University	67.5	52.0			
Have heard of UCC					
No	20.6	32.6	1.8	[1.6-1.9]	6.6
Yes	79.4	67.4			
Understanding how UCC occurs					
No	31.8	54.3	2.5	[1.6-3.8]	18.8
Yes	68.2	45.7			

Table 9 shows the association between socio-demographic parameters and non-acceptance of cervical cancer screening (UCC screening). It reveals that younger women (< 28 years) are significantly less likely to accept screening, with an odds ratio (OR) of 0.4 (95% CI: 0.2-0.7), indicating that older age (≥ 28 years) correlates with higher screening acceptance (p = 0.00). Education level also plays a role, as women with lower education levels (illiterate or primary level) are 1.8 times more likely to reject screening (OR: 1.8, 95% CI: 1.2-2.8), suggesting that higher education may increase acceptance (p = 0.00). Awareness of cervical cancer (UCC) is crucial, as those who have never heard of it are 1.8 times more likely to avoid screening (OR: 1.8, 95% CI: 1.6-1.9, p = 0.01). Furthermore, understanding how UCC occurs has a strong influence on screening acceptance; women without this knowledge are 2.5 times more likely to decline screening (OR: 2.5, 95% CI: 1.6-3.8, p = 0.00). These findings underscore the importance of targeted health education efforts to enhance awareness and understanding of UCC, particularly among younger and less-educated women, which could increase screening acceptance rates and improve early detection rates.

Table 10:
Exposure to risk of non-acceptability for UCC screening

Characteristics	Screening for cervical cancer	OR	CI95%	χ^2	p-value
No (%)	Yes (%)				
Fear of UCC					
Yes	26.6	13.9	1.8	[1.1-1.9]	6.6
No	73.4	86.1			
Have an idea about UCC screening					
No	32.9	44.2	1.6	[1.0-2.4]	4.92
Yes	67.1	55.8			
Know an organisation that organises screening					
No	6.7	34.9	7.5	[4.1-13.5]	54.3
Yes	93.3	65.1			
Distance					
Far	99.3	86.8	1.4	[1.1-1.7]	4.79
Near	0.7	13.2			
Cost of transport					
Expensive	31.1	41.9	1.5	[1.0-2.4]	18.8
Affordable	68.9	58.1			
Time lost for transport					
3 to 4 hours	86.4	81.2	1.6	[0.3-1.2]	1.20
1 to 2 hours	13.6	18.8			
Life standard					
Low and medium	68.9	58.1	1.3	[1.0-2.1]	1.54
High	31.1	41.9			

Table 11:
Determinants of non-acceptability for cervical screening in KSZ1

Factors investigated	OR	CI 95%	I.C	Coefficient	E.S	p-Value
Level of education (illiterate and primary)	8.91	1.46	35.27	2.29	0.96	0.01
Have heard of UCC/No	19.30	9.13	35.20	3.10	0.47	0.00
Distance to centre/far	22.87	8.10	60.47	3.06	0.29	0.00
Cost of transport/High	0.64	0.25	1.85	-0.48	0.47	0.34
CONSTANT	*	*	*	12.24	311.43	0.41

Table 11 presents the main determinants of non-acceptance of cervical cancer screening (UCC) in the ZSK1 area. The results show that education level, awareness of UCC, and distance from the screening center are significant factors. Women with a low education level (illiterate or primary level) are 8.91 times more likely to decline screening compared to those with a higher education level (OR = 8.91; 95% CI: 1.46-35.27; Coefficient = 2.29; p = 0.01), emphasizing the role of education in health decisions. Additionally, not having heard of UCC increases the likelihood of rejecting screening by 19.30 times (95% CI: 9.13-35.20; Coefficient = 3.10; p = 0.00),

indicating that information is crucial for screening acceptance. Moreover, a distant location from the screening center is strongly associated with non-acceptance (OR = 22.87; 95% CI: 8.10-60.47; Coefficient = 3.06; p = 0.00), highlighting the importance of geographical accessibility. In contrast, although high transportation costs were evaluated, they do not have a significant impact on screening refusal (OR = 0.64; 95% CI: 0.25-1.85; p = 0.34). In summary, lack of information, low education level, and long distance from the screening center are the main barriers to UCC screening acceptability in the ZSK1 area.

DISCUSSION

The discussion on the acceptability of cervical cancer screening in the Kalamu 1 health zone of Kinshasa highlights significant barriers that require targeted public health policies and concrete interventions. The findings from a sample of 415 women aged 24 to 55 reveal three key determinants affecting their willingness to undergo screening: low education levels, a lack of awareness about cervical cancer, and the considerable distance to healthcare facilities. Logistic regression analysis identified low education levels as a significant barrier to cervical cancer screening, consistent with findings from similar studies, such as [Tieba's \(2012\)](#) research in Senegal. Education plays a crucial role in empowering women to seek medical care and understand their rights; for example, [Agbo et al. \(2018\)](#) noted that women with higher education levels are more likely to access healthcare services. In this context, societal biases favoring boys' education over girls' contribute to the low education levels observed among women in the study.

A striking 53.3% of surveyed women reported never having heard of cervical cancer, indicating a significant knowledge gap, which was even higher than previous findings in the Democratic Republic of the Congo (DRC) ([Tshibinkufua, 2022](#)). The study underscores the vital role of healthcare professionals in providing information and raising awareness about cervical cancer, as evidenced by [Agbo et al. \(2018\)](#), who showed that women who receive information from health professionals are more likely to accept screening. Therefore, it is essential to strengthen information systems and communication strategies to improve knowledge about cervical cancer, not only among women but also within the healthcare system itself.

Additionally, the distance between women's homes and cervical cancer screening facilities was identified as another critical barrier, as many women must travel long distances to access screening services, resulting in additional financial burdens that can deter them from seeking care. The absence of local screening services is inconsistent with the primary healthcare policy in the DRC, which aims to enhance accessibility; thus, overcoming these geographical challenges is crucial for increasing screening rates. To effectively improve the acceptability and effectiveness of cervical cancer screening in the Kalamu 1 health zone, a multifaceted approach is necessary. Suggested strategies include deploying mobile screening units to reach underserved areas, implementing community-based educational campaigns targeting low-income women that address cultural beliefs and stigmas, training healthcare providers on comprehensive information about cervical cancer and screening options, and establishing financial support initiatives to subsidize transportation and consultation costs for low-income women. By integrating these strategies into public health policies, cervical cancer screening rates among women in the Kalamu 1 health zone could increase, ultimately enhancing early detection and improving health outcomes within the community while addressing the pressing barriers identified in this study.

The findings of this study on cervical cancer screening barriers in the Kalamu 1 health zone of Kinshasa align with patterns observed across Africa, where significant socioeconomic and accessibility challenges hinder screening uptake among women. Low education levels, limited awareness about cervical cancer, and substantial distances to healthcare facilities are common obstacles reported in African countries with similar healthcare contexts. For instance, studies from Senegal, such as Tieba's (2012) in the Gaspard Kamara District, identify low income, insufficient education, and restricted access to information as critical barriers, similar to those identified in the Kalamu 1 zone. These findings are echoed by Faye et al. (2017) in rural areas of Senegal's Kaffrine health district, where limited knowledge about cervical cancer and geographical inaccessibility contribute to low screening rates. A Pan-African review shows that many regions, particularly rural areas, face structural barriers to cervical cancer screening, such as inadequate

infrastructure, a lack of qualified healthcare personnel, and low availability of screening services within a manageable distance (Makadzange et al., 2022; Hussein et al., 2024).

Studies from other countries in West Africa, including Ghana and Nigeria, reveal that educational interventions and healthcare provider-led awareness programs significantly increase women's willingness to participate in screening (Mafiana et al., 2022). This reinforces the Kalamu 1 findings, where the role of healthcare providers as sources of information was crucial, supporting broader evidence that direct engagement with women by trusted health professionals can positively impact screening rates. Furthermore, the lack of awareness of cervical cancer, as identified in Kalamu 1 where over half of the women had never heard of the disease, is consistent with trends in other African countries, where knowledge gaps remain extensive. According to WHO reports and studies such as Mantula et al. (2024), knowledge about cervical cancer screening and risk factors is generally low, which impedes early detection and intervention. In regions like East and Southern Africa, efforts to increase screening rates have seen some success through mobile health initiatives (Aboye et al., 2023; Yang et al., 2023; Nkosi, 2024), similar to the recommendations for mobile screening units in the Kalamu 1 health zone, which could help overcome geographic barriers effectively.

Thus, the Kalamu 1 study's findings mirror the structural and socioeconomic barriers reported in many African contexts, emphasizing the urgent need for policies that enhance access, provide community education, and address cultural and logistical barriers. The consistent identification of low education and awareness levels as major factors across African studies suggests that addressing these barriers through educational outreach and accessible healthcare services could be transformative for cervical cancer prevention and early detection efforts throughout the continent.

CONCLUSION

The study aimed to identify the factors influencing women's acceptability of cervical cancer screening in the Kalamu 1 Health Zone of Kinshasa City and Province. The analysis pinpointed three key barriers: low educational

levels among women, a general lack of awareness regarding cervical cancer, and the significant distance from women's homes to health facilities providing screening services. To address these issues, several concrete actions are recommended. Educational programs focused on cervical cancer and its prevention should be implemented, and community health workers should be engaged to disseminate information and raise awareness. Additionally, establishing more accessible screening facilities within the community is essential. Transportation services could be arranged to assist women in reaching screening sites, and outreach campaigns should be conducted to encourage regular screening and follow-up care, thereby increasing participation in cervical cancer prevention efforts.

Acknowledgements: Sincere appreciation is extended to the management staff of ZSK1 in the city and province of Kinshasa, as well as the nurses and community relay members in the selected health areas, for their collaboration throughout the survey period in the Kalamu 1 Health Zone.

Ethics Approval: Ethical approval was granted by the DRC Ministry of Health's National Health Ethics Committee (certificate no. 98/CNES/BN/PMMF/2019, August 10, 2019).

ORCID iDs:

Aloma, G. A.¹: Nil identified
 Ngwamah, A. F. B.¹: <https://orcid.org/0009-0009-9440-8026>
 Mawunu, M.²: <https://orcid.org/0000-0001-6658-9223>
 Mbungu, R. M.³: Nil identified
 Ngbolua, K. N.^{4,5}: <https://orcid.org/0000-0002-0066-8153>
 Omanyondo, M. O.¹: Nil identified
 Wembodinga, G. U.⁶: Nil identified

Open Access: This original article is distributed under the Creative Commons Attribution Non-Commercial (CC BY-NC 4.0) license. This license permits people to distribute, remix, adapt, and build upon this work non-commercially and license their derivative works on different terms, provided the original work is properly cited, appropriate credit is given, any changes made are indicated, and the use is non-commercial. See: <https://creativecommons.org/licenses/by-nc/4.0/>.

REFERENCES

Aboye, G. T., Vande Walle, M., Simegn, G. L., & Aerts, J. M. (2023). mHealth in sub-Saharan Africa and Europe: A systematic review comparing the use and availability of mHealth approaches in sub-Saharan Africa and Europe. *Digital Health, 9*, 20552076231180972. <https://doi.org/10.1177/20552076231180972>

Agbo, M., Dorka, D., & Folly, A. (2018). Connaissance et pratique des femmes togolaises vis-à-vis du cancer

du col de l'utérus. *Médecine et Santé Tropicales, 28*, 82-85.

Alliance pour la Prévention du Cancer du Col (APCCP). (2006). *Planification et mise en œuvre des programmes de prévention et lutte contre le cancer du col : Manuel à l'usage des organisateurs*. Seattle: ACCP.

Amuli Jiwe, J. P., & Ngoma Mademvo, O. (2011). *Méthodologie de la recherche scientifique en soins et santé*. Médiaspaul.

Anderson, B. O., Yip, C. H., Smith, R. A., Shyyan, R., Sener, S. F., Eniu, A., Carlson, R. W., Azavedo, E., & Harford, J. (2008). Guideline implementation for breast healthcare in low-income and middle-income countries: Overview of the Breast Health Global Initiative Global Summit 2007. *Cancer, 113*(8 Suppl), 2221-43. <https://doi.org/10.1002/cncr.23844>

Cannistra, S. A., & Niloff, J. M. (1996). Cancer of the uterine cervix. *New England Journal of Medicine, 334*(16), 1030-8. <https://doi.org/10.1056/NEJM199604183341606>

Cedric, A. E. (2008). Les méthodes statistiques. *Série des documents de travail, méthodologie statistique n°0301, les modèles logit polytomiques non ordonnés, théorie et applications*. INSSE, 13-15.

Dakenyo, R. D., Kenfack, B., Vogue, N., Tsakoue, E. F., Ebode, M. E., & Cumber, S. N. (2018). Connaissances, attitudes et pratiques des femmes en âge de procréer du District de Santé de la Mifi sur la prévention du cancer du col de l'utérus, Cameroun. *Pan African Medical Journal, 31*, 172. <https://doi.org/10.11604/pamj.2018.31.172.16320>

Denny, L., & Ngan, H. Y. S. (2006). Section B: Malignant manifestations of HPV infection. Carcinoma of the cervix, vulva, vagina, anus, and penis. *International Journal of Gynaecology and Obstetrics, 94*(Suppl 1), S50-S55. [https://doi.org/10.1016/S0020-7292\(07\)60010-1](https://doi.org/10.1016/S0020-7292(07)60010-1)

Direction de la recherche, de l'évaluation et des statistiques. (2009). *Masson*.

Elkhansa, M. (2012). Facteurs d'adhésion au dépistage du cancer du sein et du col utérin aux préfectures médicales de Rabat et Skhirat. *Mémoire de spécialisation en médecine*.

- Faye, A., Thierno, M., & Taltal, A. (2017). Facteurs associés au dépistage du cancer du col de l'utérus en milieu rural sénégalais. *District ministère de la santé et de l'action sociale, Dakar-Fann*. Masson.
- Hussein, K., Kokwaro, G., Wafula, F., & Kassie, G. M. (2024). Factors influencing the uptake and utilization of cervical cancer screening services among women attending public health centers in Addis Ababa, Ethiopia: Mixed methods study. *BMC Women's Health*, 24(1), 3. <https://doi.org/10.1186/s12905-023-02850-x>
- Info Cancer. (2019). Les localisations cancers féminins, les cancers du col de l'utérus. *Épidémiologie, Menu dossier thématique, France*.
- KCE - Centre fédéral d'expertise des soins de santé. (2007). *Rapport annuel 2006 du Centre fédéral d'expertise des soins de santé* (66 p.).
- Labama. (2006). *Méthodologie de la recherche et statistiques en sciences biomédicales*. Presse de l'Université de Kisangani.
- Mafiana, J. J., Dhital, S., Halabia, M., & Wang, X. (2022). Barriers to uptake of cervical cancer screening among women in Nigeria: A systematic review. *African Health Sciences*, 22(2), 295-309. <https://doi.org/10.4314/ahs.v22i2.33>
- Makadzange, E. E., Peeters, A., Joore, M. A., & Kimman, M. L. (2022). The effectiveness of health education interventions on cervical cancer prevention in Africa: A systematic review. *Preventive Medicine*, 164, 107219. <https://doi.org/10.1016/j.ypmed.2022.107219>
- Mantula, F., Toefy, Y., & Sewram, V. (2024). Barriers to cervical cancer screening in Africa: A systematic review. *BMC Public Health*, 24(1), 525. <https://doi.org/10.1186/s12889-024-17842-1>
- Mashinda, K. D., Kayembe, K. P., & Mapatano, M. A. (2021). Prévalence du cancer en République Démocratique du Congo: Données anatomopathologiques recueillies aux Cliniques Universitaires et à l'Hôpital Général de Référence de Kinshasa. *Annales Africaines de Médecine*, 5(3).
- Méd. Presse. (2003). Dépistage du cancer du col de l'utérus: État des lieux. *Santé Dev*, 32(33), 1545-1552.
- Michel, P., Amalberti, R., Runciman, W. B., et al. (2010). Concepts et définitions en sécurité des patients: La Classification internationale pour la sécurité des patients de l'Organisation mondiale de la santé. *Risques et Qualité*, 7, 133-143.
- MONUSCO. (2019). Le cancer du col utérin tue plus que celui du sein, RDC.
- Nkosi, Z. P. (2024). Patients' experiences in the use of mobile health clinics in KwaMachi rural area of KwaZulu-Natal, South Africa. *Dialogues in Health*, 4, 100164. <https://doi.org/10.1016/j.dialog.2023.100164>
- OMS. (2017). *La lutte contre le cancer du col de l'utérus: Guide des pratiques essentielles - 2ème éd.* [Comprehensive cervical cancer control: A guide to essential practice - 2nd ed.]. Genève: Organisation mondiale de la Santé.
- Pan American Health Organization. (2017). *Profile of capacity and response to noncommunicable diseases and their risk factors in the Region of the Americas: Country capacity survey results, 2015*. Washington, D.C.: PAHO.
- Réunion: les femmes touchées réunionnaises sont-elles plus jeunes que les femmes métropolitaines? (2015). *Médecine humaine et pathologie*. (dumas-01200825).
- Sampson, C. N., Nkpebo, S. D., & Degley, T. A. (2021). Connaissances, attitudes et croyances concernant le dépistage du cancer du col de l'utérus dans le District d'Ajumako-Enyan-Essiam au Ghana. *Canadian Oncology Nursing Journal*, 31(3), 291-297. <https://doi.org/10.5737/23688076313291297>
- Stephanie, B., et al. (2010). État des lieux et recommandations pour le dépistage du cancer du col de l'utérus en France. *Paris Autorité Sanitaire, HAS*, 17-18.
- Tieba, M. T. (2012). Étude des déterminants du recours au dépistage du cancer du col de l'utérus dans le district centre de Dakar. *Mémoire Diplôme d'Études Supérieures Spécialisées en économie de la santé*. CESAG, 87 p.
- Tshibinkufua, J. R. P. (2022). Zoom sur le cancer du col utérin chez les adolescentes à Kananga au Kasai-Central en République Démocratique du Congo. *Revue de l'Infirmier Congolais*, 6(2), 51-56.
- WHO. (2018). *Health topics*. Consulté le 10/10/2018.
- Yang, L., Boily, M. C., Rönn, M. M., Obiri-Yeboah, D., Morhason-Bello, I., Meda, N., Lompo, O., Mayaud,

P., Pickles, M., Brisson, M., Hodgins, C., Delany-Moretlwe, S., & Maheu-Giroux, M. (2023). Regional and country-level trends in cervical cancer screening coverage in sub-Saharan Africa: A systematic analysis of population-based surveys (2000–2020). *PLOS Medicine*, 20(1), e1004143. <https://doi.org/10.1371/journal.pmed.1004143>.