

Knowledge, Attitudes, and Practices Towards Cervical Cancer Screening Among Rural Women in the South Comoe Region, Côte d'Ivoire in 2020

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Abstract: *Background:* Cervical cancer is one of the leading causes of death in women worldwide. In Côte d'Ivoire, it is the second leading cause of cancer deaths among women. *Objective:* To describe the knowledge, attitudes and practices of cervical cancer screening among rural women in the South Comoe region in 2020. *Method:* A cross-sectional study was conducted in rural communities in Côte d'Ivoire targeting women aged 25 to 55 years. A standardized questionnaire collected the participants' socio-demographic data, their knowledge, attitudes and practice of cervical cancer screening, as well as barriers to cervical cancer screening. A logistic regression was performed to identify the determinants associated with rural screening uptake. *Results:* 321 adult women with a median of 36.8 [IQR: 30 - 43] years were included, of which 50.2% were out of school and 86.6% had a monthly income of less than 90 USD. Of these, 168 (52.3%) had ever heard of cervical cancer, with 79.2% of them considering themselves uninformed. In addition, 13.4% of women had already screened for cervical cancer. Factors associated with screening practice were age 40 years (aOR= 3.2; IC= [1.3 - 8.3]), and information received about cervical cancer during a mass campaign (aOR= 24.1; IC= [8.8 - 66.2]) or by health care staff (aOR= 3.2; CI= [1.2 - 8.1]). *Conclusion:* Knowledge and practice of cervical cancer screening is inadequate among rural women. It is therefore important to increase awareness while integrating screening services across the country in order to reduce inequalities in access to care in Côte d'Ivoire.

Keywords: Knowledge, Attitudes, Practice, Cervical Cancer, Rural Africa

1. Introduction

Cervical cancer is a major public health problem in sub-Saharan Africa; 19 of the 20 countries most affected by the disease are on the African continent [1]. The major cause is persistent infection with high-risk human papillomavirus (HPV), particularly genotypes 16 and 18 [2, 3]. Their role in the occurrence of carcinological lesions of the cervix has been demonstrated [4-6]. In Côte d'Ivoire, cervical cancer ranks second in terms of incidence after breast cancer and is the second leading cause of cancer death in women [7] despite the

efforts made by the authorities in charge of cancer control. Indeed, nearly three quarters of cervical cancers are diagnosed late, thus limiting the availability of curative care at the time of diagnosis [8]. This tendency is more pronounced in rural areas because women living in rural or semi-urban areas are more likely to develop invasive cervical cancer because of poor health coverage, poverty, and low literacy levels, which may limit their knowledge and attitudes about cervical cancer [9, 10]. However, cervical cancer is amenable to prevention because of its long natural history and its quasi-infectious etiology. Prevention involves vaccination against the major oncogenic HPV types, screening and treatment of

precancerous lesions [10]. While cytology has been shown to significantly reduce cervical cancer morbidity and mortality in industrialized countries [11–13], it remains difficult to apply in a large-scale program because of the human and financial resource requirements that are too high for developing countries [14–18]. To overcome this problem, the World Health Organization (WHO) has recommended effective methods for resource-limited countries, including visual inspection of the cervix after application of acetic acid (VIA) and/or lugol (VILI), which have been previously developed and validated [19, 20].

Therefore, in Côte d'Ivoire, national guidelines recommend screening based on VIA/L in women aged 25 to 55 years and cervical smear from 50 years or those in whom the transition zone is no longer visible [21]. Awareness campaigns are regularly conducted by the National Cancer Control Program (NCCP) with the support of its partners in order to communicate information on this disease and the means of prevention to the population. However, according to the NCCP's activity report, a good number of screening centers have been opened in referral hospitals at the tertiary level of the health pyramid, and awareness campaigns are conducted mainly in urban or semi-urban areas [21].

To date, data on knowledge, attitudes, and practice of cervical cancer screening among rural women are limited in Côte d'Ivoire. The objective of this study was to describe the knowledge, attitudes, and practices of cervical cancer screening among rural women in the South Comoe region and to analyze the factors associated with the use of screening.

2. Method

2.1. Study Design

A descriptive and analytical cross-sectional study was conducted from February 4 to March 10, 2020 in the villages of Djiminikoffikro, Kakoukro, Kouakro and Affienou, all located in the South Comoe region. The South Comoe region is a region in the southeast of Côte d'Ivoire, located in the Comoe district. It has an area of 8,103 km² and an estimated population of 683,145 residents. Its largest city and regional capital, Aboisso, is located about two hours drive from the capital of Côte d'Ivoire, Abidjan [22].

2.2. Study Population

Our study involved adult women between 25 and 55 years, residing in the four studied villages, who gave verbal consent to participate in our study.

2.3. Sampling

The sampling was exhaustive and all the women we met were invited to participate in our study. In case of refusal, another woman was asked to participate in the study until the end of the study period and according to the calculated sample size.

2.4. Number of Participants Required

Data on cervical cancer screening in rural areas are limited in our country. However, studies conducted in Senegal, Nepal, and South Africa have shown rather low proportions of women screened in rural areas, at 6.3%, 13.6%, and 18%, respectively [23–25]. Given these figures, we hypothesized that the proportion of women screened would be low at 20%, at a risk of $\alpha = 5\%$. Thus, we planned to include at least a total of 245 women, according to the following formula:

Formula for calculating the required sample size.

$$N = \frac{Ua^2 \times f(1-f)}{i^2} = \frac{1,96^2 \times 0,2(1-0,2)}{0,05^2} = 245$$

With N= sample size, f= expected prevalence of cervical cancer screening in our study population and i= the precision with which we want to estimate the prevalence P of cervical cancer screening in our sample. This calculated size was increased by 10% to anticipate nonresponse, bringing the total to 270.

2.5. Data Collection

A questionnaire inspired by a similar study conducted with women living with the human immunodeficiency virus (HIV), and then with women in Abidjan, was adapted to the rural context and then submitted to a resource person from the NCCP for pre-validation. Then, this questionnaire, which included closed and semi-open questions, was pre-tested on January 14, 2020 in Mondoukou, a village located in the commune of Grand-Bassam. Finally, the inconsistencies raised allowed us to make some corrections to our questionnaire. The final questionnaire allowed us to collect data during a face-to-face interview at home. The questionnaire was administered by a trained interviewer accompanied by a community health worker (CHW) who served as an interpreter in local languages for women who were not comfortable with the French language. The information collected included: Socio-professional characteristics (age, occupation, marital status, level of education and monthly income), women's knowledge and attitudes about cervical cancer screening (general knowledge, knowledge of risk factors, prevention measures, symptoms and their perception of the disease), women's practices on cervical cancer screening (history of screening, reasons for not screening) and barriers to voluntary cervical cancer screening.

2.6. Data Management

The data collected were digitized from a data entry mask designed in Epi Data 3.1. Statistical analyses were done with R Studio version 4.1.2. Qualitative and quantitative variables were described as proportions (percentage) and median, interquartile range (IQR) respectively. For bivariate analysis, Chi-square tests of independence and Fisher exact tests were used when the conditions for applying these tests were met.

To limit confounding bias, logistic regression analysis was used to examine factors associated with cervical cancer screening in rural areas. First, variables that had a $p \leq 0.25$ in

the univariate analysis were retained for the multivariate analysis. Then, all these variables were included in the initial model for the multivariate analysis. Then, using the top-down stepwise procedure, nonsignificant variables ($p > 0.05$) were discarded one after another. Lastly, in the final model, those with a $p \leq 0.05$ were considered significantly associated with rural cervical cancer screening.

2.7. Regulatory and Ethical Aspects

This study was conducted with the authorization and under the auspices of the Ministry of Health and Public Hygiene (MSHP) through the NCCP. Women were free to participate in the study. Verbal consent, following a brief presentation of the study (Appendix 2), was required from each participant before the questionnaire was administered. The study was presented to each woman in the local language or in French by a previously identified CHW. Women were given the opportunity to ask questions and retained the choice to refuse to answer certain questions or to participate in the study. They could also withdraw during the interview.

3. Results

3.1. Socio-Demographic Characteristics of Participants

A total of 349 women were approached and 28 (8.0%) women refused to participate in the study. Thus 321 (92.0%) women were included in this study. The median age was 36.8 years, and 78.5% of the participants were younger than 45 years (Table 1). Of the participants, 70.1% were living with a partner and 86.6% had a monthly income of less than 90 US dollars (USD). Also, more than three-quarters of the participants (78.9%) had no formal education or only primary education. The majority of participants did not have health insurance (95.6%).

Table 1. Socio-demographic characteristics of rural women in South Comoe in 2020.

	Number (n=321)	Proportion (%)
Age (years)		
Médian, [IQR]	36.8	[30 – 43]
[25-34]	144	44.9
[35-44]	108	33.6
[45-55]	69	21.5
Marital status		
Married	119	37.1
Cohabiting	106	33.0
Single	80	24.9
Widow	12	3.7
Divorcée	4	1.3
Monthly income (USD)*		
No income	111	34.6
<90	167	52.0
[90 - 301]	37	11.5
> 301	6	1.9
School level		
Not in school	161	50.2
Primary	92	28.7
Secondary	54	16.8
Higher	14	4.3
Health coverage		

	Number (n=321)	Proportion (%)
Insured	307	95.6
Not insured	14	4.4

*Exchange rate in September 2022 (1 USD= 663.25 Francs CFA). 90 USD represents the guaranteed minimum wage in Côte d'Ivoire.

3.2. Knowledge About Cervical Cancer

In terms of knowledge about cervical cancer, 52.3% of participants reported having heard of cervical cancer and 47.7% had never heard of it (Table 2). Of the participants who had heard of cervical cancer, 79.2% reported that they were not well informed.

The main sources of information for participants were the media (television, radio, press, posters, internet) at 48.2% followed by health personnel at 40.5%.

Prevention of sexually transmitted infections (STI) was identified as the main means of cervical cancer prevention by 29.8% of participants, and 10.1% identified HPV vaccination as a means of cervical cancer prevention. More than half of the participants (54.2% and 51.8%) identified respectively multiple sexual partners and early sexual intercourse as the main risk factors for cervical cancer.

Table 2. Knowledge of cervical cancer among rural women in South Comoe in 2020.

	Number	Proportion (%)
Heard about cervical cancer (n=321)		
Yes	168	52.3
No	153	47.7
Clarity of information about cervical cancer (n=168)		
Not well informed	133	79.2
Well informed	35	20.8
Sources of information (n=168)		
Media	81	48.2
Health care staff	68	40.5
Awareness campaign	35	20.8
Close	32	19.0
Prevention methods (n=168)		
STI prevention	50	29.8
Screening	49	29.2
Religion	32	19.0
Traditional treatment	30	17.9
Vaccination	17	10.1
Other	17	10.1
Risk factors (n=168)		
Multiple sexual partners	91	54.2
Early sex	87	51.8
HIV-AIDS infection	60	35.7
Multiparity	45	26.8
Tobacco	39	23.2
Contraception	38	22.6
HPV infection	8	4.8

*Television, radio, press, posters, internet.

3.3. Attitudes and Practices of Cervical Cancer Screening

In our study, 62.6% of participants felt that cervical cancer screening was important (Table 3). Also 87.2% of the participants had never wanted information about cervical cancer prevention before our survey. The number of women

screened for cervical cancer among the participants was 43 or 13.4%, and the technique performed was 100% VIA. The main context for cervical cancer screening was during an awareness and screening campaign (95.4%).

Among the 278 women not screened for cervical cancer,

the main reasons given were lack of information about cervical cancer screening [216 (77.7%)], negligence [26 (9.4%)], lack of a screening center in the locality [17 (6.1%)] and fear of the screening procedures and/or diagnosis [15 (5.4%)].

Table 3. Attitudes and practice of cervical cancer screening among rural women in South Comoe in 2020.

	Number	Proportion (%)
Cervical cancer screening important (n=321)		
Yes	201	62.6
No	7	2.2
No idea	113	35.2
Previous desire for cervical cancer prevention information (n=321)		
Yes	41	12.8
No	280	87.2
Practice of screening (n=321)		
Yes	43	13.4
No	278	86.6
Screening context (n=43)		
During a campaign	41	95.4
Self-initiated	1	2.3
Screening suggested by health care staff	1	2.3
Reason for not screening (n=278)		
Lack of information about cervical cancer screening	216	77.7
Neglect	26	9.4
Lack of screening facility in community	17	6.1
Fear of screening/diagnosis	15	5.4
Fear of additional costs	2	0.7
Other	2	0.7

3.4. Factors Associated with the Use of Screening in Rural Areas

Table 4. Factors associated with cervical cancer screening among rural women in South Comoe in 2020.

Independent variables	Screening performed (yes)	Univariate model			Multivariate model (final)		
	n*(%)	OR crude	[95 % IC]	p-value	OR adjusted	[95 % ICa]	p-value
Age at screening (years)							
<40	21/107 (19.6)	1			1		
≥40	22/61 (36.1)	1.9	[1.0 – 3.6]	0.051	3.2	[1.3 – 8.3]	0.015
Marital status							
Lives alone	11/49 (22.4)	1					
In couple	32/119 (26.9)	1.3	[0.6 – 2.7]	0.506			
Level of education							
No schooling/Primary	32/113 (28.3)	1					
Secondary/Higher education	11/55 (20.0)	1.3	[0.6 – 2.8]	0.449			
Monthly income (USD)							
<90	32/136 (23.5)	1					
≥90	11/32 (34.4)	2.6	[1.2 – 5.8]	0.012	-	-	-
Health insurance							
Not insured	40/154 (26.0)	1					
Insured	3/14 (21.4)	1.8	[0.5 – 6.8]	0.368			
Clarity of information							
Uninformed	30/133 (22.6)	1					
Well informed	13/35 (37.1)	2.0	[0.9 – 4.5]	0.079	-	-	-
Origin of information							
Media	15/81 (18.5)	1					
Close	2/32 (6.3)	0.2	[0.0 – 1.4]	0.062	-	-	-
Campaign	26/35 (74.3)	16.1	[3.3 – 79.5]	<0.001	24.1	[8.8 – 66.2]	<0.001
Health care staff	20/47 (42.6)	3.3	[1.3 – 8.2]	0.006	3.2	[1.2 – 8.1]	0.016

*n/N= number of women screened/number of women who heard about cervical cancer.

In multivariate analysis, after adjustment, women over 40 years of age (aOR=3.2; CI=[1.3 - 8.3]; p=0.015) and who had heard about cervical cancer during an awareness campaign (aOR=24.1; CI=[8.8 - 66.2]; p<0.001) or through

a health care provider (aOR=3.2; CI=[1.2 - 8.1]; p=0.016) were more likely to be screened for cervical cancer (Table 4).

4. Discussion

4.1. Summary of the Main Results

Our study, which took place in the rural areas of South Comoe, reported that 52.3% of the participants had ever heard of cervical cancer. The main sources of information for participants were the media at 48.2% followed by health personnel at 40.5%. In our study, 62.6% of participants felt that cervical cancer screening was important. The proportion of women screened for cervical cancer among participants was 13.4%, and the main context for screening was during an awareness and screening campaign (95.4%). Among women not screened for cervical cancer, the main reasons given were lack of information about cervical cancer screening (77.7%), negligence (9.4%), lack of a screening center in the locality (6.1%) and fear of screening procedures and/or diagnosis (5.4%).

Finally, women over 40 years of age who had been informed during a campaign or by health personnel were more likely to be screened for cervical cancer.

4.2. External Validity

In our study, we were dealing with a young population because the median age of the participants was 36.8 years. Our study population is slightly younger than that of *Hoque et al* [25]. This difference in age could be explained by the fact that in South Africa the technique used is the cervico-uterine smear, which is a technique that can be performed up to 65 years of age, and also by the fact that the minimum age of inclusion of women in this study was 30 years, which is higher than the minimum age of our study, which was 25 years.

Our study also revealed a low level of education with 78.9% of the women having a level of education not exceeding primary school. Also, it should be noted that most of the participants had unfavorable social conditions with 86.6% of them having a monthly income below the ivoirien minimum wage (90 USD) and nearly 95.6% of them having no health insurance. These figures highlight the precariousness of these women and their vulnerability; and should alert decision-makers to the need for schooling for young girls and social support for rural populations. Our study revealed that only 52.3% of the participants had heard of cervical cancer, and of those who had heard of cervical cancer, 79.2% said they had not been well informed about cervical cancer. Other studies conducted elsewhere showed contrasting results to ours, including in Zimbabwe, where 85% of participants had ever heard of cervical cancer, and in Nepal, where only 12.6% of participants had sufficient knowledge about cervical cancer [24, 26].

The study found that 29.8% of participants knew at least one way to prevent cervical cancer, and more than half (54.2%) knew at least one risk factor for cervical cancer. All these figures show an insufficient level of knowledge about cervical cancer among women living in rural areas and could be explained by the poor dissemination of information about cervical cancer in rural areas of Côte d'Ivoire. At the health facility level, women should be sensitized during mother and child health consultations and in general medicine. Clearly,

any woman who attends a health center must have a minimum of information on cervical cancer (severity of the disease, possibility of early detection and cure) that would encourage her to undergo screening. At the institutional level, the NCCP should develop messages adapted to rural realities and take advantage of the opportunity presented by community radio stations to broadcast awareness messages in the local language. In collaboration with the Ministry of Education and Women's Empowerment, information sessions should be organized in schools for girls and boys, and girl leaders should be trained to act as intermediaries with mothers to promote screening. In addition, chapters dedicated to vaccine-preventable diseases, including cervical cancer, should be included in the secondary school program. In our study, the majority of participants had a favorable attitude toward cervical cancer screening. About 62.6% of them felt that cervical cancer screening was important. Although important, this figure is still low compared to other countries such as Nepal, where 71.7% of women had a favorable attitude toward cervical cancer screening [24]. Also, several studies have shown that literate women have significantly higher cervical cancer screening behavior than illiterate women [27]. However, education alone may not be sufficient to motivate women to undergo screening in a rural area. Therefore, the outreach program must be conducted in a way that promotes the use of screening. At the same time, women's empowerment and cultural sensitivity should also be addressed in the implementation of such programs. Female health professionals and female CHWs can play an important role in overcoming some of the sociocultural issues, as women generally feel embarrassed to talk to or be examined by a male health professional. Finally, this situation should draw the attention of policymakers to the need to combat the stigma that can negatively influence screening for rural women. Cervical cancer screening is generally painless, effective, and inexpensive compared with the cost of treating an outbreak, messages that should be disseminated to rural populations. Only 13.4% of participants received cervical cancer screening. This result is certainly low but remains encouraging compared to the studies of *Mourot et al* (8.7%) and *N'guessan et al* (6.2%) conducted respectively in the Hambol region in 2014 and in Bingerville in 2018 [28, 29]; and testifies to the effectiveness of the numerous awareness and screening campaigns conducted by NGOs in these areas, thereby making up for the absence of screening centers in rural areas. Although encouraging, this figure is far from the expected coverage of 70% in Côte d'Ivoire set by the NCCP. Older participants were more likely to be screened for cervical cancer. This reality demonstrates the need to get young people to feel much more concerned about cervical cancer screening. Also, women who had been informed during an awareness campaign or by health personnel were more likely to be screened for cervical cancer. The finding is that awareness campaigns are conducive to screening in rural areas. They should therefore be organized on a regular basis or during specific contexts such as days dedicated to the fight against cancer and women's rights.

Finally, our survey data suggest that the main reasons for the low rate of cervical cancer screening among rural women are individual and logistical. Indeed, lack of information, neglect, absence of a screening center in the locality, and fear of screening procedures and diagnosis were identified as the main reasons for not using cervical cancer screening. This result raises once again the issue of extending screening services with equipment and trained personnel in all rural areas. It is feasible, especially since VIA is less demanding and requires only very accessible inputs, in addition to trained medical or para-medical personnel. In addition, the training and equipment of CHWs should be a concern for the authorities in charge of cancer control, especially since these people, who are permanently present in the communities, will help to reassure women and encourage them to go for screening. Promoting peer education by encouraging women who are satisfied with screening to motivate other women would be a winning strategy. Women who are screened, regardless of the outcome, could in turn explain the cervical cancer screening process to their friends and family members (sisters, mothers, and others) and encourage them to do the same. A visual brochure developed by the NCCP could be used as a visual aid. This strategy will be in line with one of the WHO guidelines that calls for community participation in health promotion and chronic disease prevention by community representatives [30]. It would provide the basis for the successful implementation of universal health coverage (UHC) in rural areas by preparing the community to take an active part in its well-being. UHC would address the inequity of care that rural women experience with respect to cervical cancer screening by promoting financial accessibility to early detection and management of this cancer.

4.3. Limitations of the Study

This study conducted among women living in rural areas in the South Comoe region has some weaknesses that should be mentioned.

It was conducted in a region located about two hours' drive from the district of Abidjan, the economic capital of Côte d'Ivoire. Consequently, the rural areas of the West and North of the country, which are much further away from the capital Abidjan and which may be less favored than the regions near Abidjan due to logistical difficulties, were not taken into account in our study. In addition, the fact that our survey took place in an area where there have been recent awareness and screening campaigns, all these factors combined expose our study to a possible selection bias. However, to our knowledge, it is the first study of its kind on access to screening in rural areas in Côte d'Ivoire and could have an impact on the national strategy for cervical cancer control and the fight against inequalities in access to health services in our country. It also used an already validated tool with a rigorous selection of participants. It is therefore an interesting starting point, as it provides a reflection, albeit imperfect, of the reality of access to cervical cancer screening in rural areas and will allow the survey to be replicated in other regions of the country.

5. Conclusion

Our study revealed insufficient knowledge and a screening practice far from the national and global objectives. It is therefore important to increase awareness, deploy screening services in all rural areas of the country, and introduce peer-to-peer promotion of screening among women. Social security should also be popularized to improve women's access to cervical cancer screening services in rural areas. Also, qualitative studies should be conducted among rural women to better understand the barriers and facilitators to accessing cervical cancer screening, with a view to achieving the 2030 elimination goals.

Conflict of Interest Statement

The Authors Declare no Conflicts of Interest.

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