Research Square

Preprints are preliminary reports that have not undergone peer review.
They should not be considered conclusive, used to inform clinical practice,
or referenced by the media as validated information.

Women's knowledge, risk behaviors and practices regarding cervical cancer and its screening: An Analytical Cross-Sectional Study Conducted at the External Obstetrics-Gynecology Department of the University Hospital of Mirebalais

Woodeline Guerrier
woguerrier@pih.org
Hôpital Universitaire de Mirebalais
Jouselie Faurestal
Hôpital Universitaire de Mirebalais
Jaccin Joseph
Hôpital Universitaire de Mirebalais
Flawendjee Djaweelentz Jacques
Hôpital Universitaire de Mirebalais
Christophe Millien
Hôpital Universitaire de Mirebalais

Research Article

Keywords: Knowledge, Risk Behaviors, Cervical Cancer Screening, Barriers, Cervical Cancer, Haiti

Posted Date: August 14th, 2025

DOI: https://doi.org/10.21203/rs.3.rs-7032735/v1

License: This work is licensed under a Creative Commons Attribution 4.0 International License. Read Full License

Additional Declarations: No competing interests reported.

Abstract

Introduction

Cervical cancer is a public health problem. Although it is mainly considered preventable, it still represents a significant burden of mortality among women in developing countries. In Haitian women, cervical cancer is the second leading cause of cancer-related mortality. Despite efforts such as the implementation of screening and treatment services for precancerous lesions, few women are screened. No studies were found in the literature that evaluated the level of knowledge and use of screening services among Haitian women. Our study aims to assess the level of knowledge, risk behaviors, and practices regarding cervical cancer and its screening among Haitian women.

Methods

A cross-sectional analytical study using a structured questionnaire in Haitian Creole was conducted at the University Hospital of Mirebalais. Participants were selected through exhaustive sampling during consultation days from August 1 to 31, 2023. Data were analyzed using Epi Info version 7.2.6.0 and SPSS 26. Descriptive statistics were calculated for sociodemographic variables, while bivariate analysis and logistic regression were used for predictors of the analytical aspect. A 95% confidence interval and a p-value ≤ 0.05 were used to identify statistically significant factors.

Results

Among the 333 women, 96.7% had a low level of knowledge about cervical cancer and its screening, 58.25% had low-risk behaviors, and 36.64% had been screened. A significant association was found between the level of knowledge and higher education (P = 0.040). Cervical cancer screening showed significant associations with knowledge level (P = 0.003), risk behaviors (P = 0.0043), parity (P = 0.0031), education level (P = 0.0101), marital status (P = 0.0046), religion (P = 0.0309), and age (P = 0). Independent predictors of cervical cancer screening were age, low knowledge level, and intermediate-risk behavior. The most frequently mentioned barrier to screening by the women in the study was a lack of knowledge about cervical cancer.

Conclusion

This study reveals significant gaps in knowledge about cervical cancer among Haitian women, with a low screening rate despite existing initiatives. Awareness and screening campaigns are needed. Strengthening access to screening infrastructure and services is crucial.

INTRODUCTION

Cervical cancer, one of the most common gynecological cancers worldwide, is a public health problem and a significant barrier to increasing life expectancy in all countries (1). In 2020 alone, Global Cancer Statistics 2020 estimates that 604,000 women worldwide will be diagnosed with cervical cancer. Approximately 342,000 women died from the disease (2), with more than 85% of these deaths occurring in developing countries (3) due to a lack of prevention programs, screening, and limited resources for treatment (4). Although it is considered almost entirely preventable through preventive measures, including vaccination of girls and boys, screening, and treatment of precancerous lesions, several barriers hinder the implementation of these measures in some countries (5).

Cervical cancer has the second highest cancer mortality rate among Haitian women, and in 2022, three hundred and twenty-three (323) women died from cervical cancer (6). However, despite the introduction of screening strategies based on visual inspection with acetic acid and treatment, as well as the establishment of screening sites (7), this service remains underutilized by the population due to low awareness and limited access to screening services, with fewer than one in ten women being screened (8).

Reports from many developing countries indicate that women have inadequate knowledge about the causes, risks, and prevention of cervical cancer (9), and studies by Sharron SK and Ivy Leung in 2010 show that the level of knowledge about cervical cancer and screening services has a direct impact on the uptake of screening services (10).

Except for the EMMUS VI survey, which provides limited information on Haitian women's knowledge of cervical cancer and its screening (11), no studies have been identified in the literature that evaluate the relationship between Haitian women's knowledge and their use of screening services in Haiti. This study aims to evaluate the level of knowledge, risk behaviors, and practices regarding cervical cancer and its screening among women attending consultations at the external obstetrics and gynecology service of the University Hospital of Mirebalais.

METHODS

This is an analytical cross-sectional study of women aged 18 to 60 years who attended the Obstetrics-gynecology outpatient clinic at the University Hospital of Mirebalais during consultation days (except Wednesdays) from August 1 to 31, 2023. Women were selected using an exhaustive sampling method. Women were excluded if they were under follow-up at the Onco-Gynecology Clinic, if they had medical problems that limited their ability to participate in the study, or if they developed a medical, surgical, or psychological emergency during the interview. Women who consented to participate after being informed of the study objectives were directly enrolled and interviewed for approximately 30 minutes in a confidential area of the hospital.

We used a structured questionnaire developed by the authors in Haitian Creole, based on a literature review and adapted to the objectives of the study. It consisted of 39 questions divided into five sections (12): The first section included seven questions on the sociodemographic characteristics of the participants; the second section contained 15 questions to assess knowledge about cervical cancer, eligibility for screening, and the recommended screening interval according to the USPSTF (13); the third section identified women's risk behaviors related to cervical cancer through 12 questions; the fourth section investigated screening practices through four questions; and the fifth section identified perceived barriers to screening among participants with no history of screening, assessed through a closed-ended question. The full questionnaire is provided in English in the Supplementary Material.

The level of knowledge about cervical cancer (section 2 of the questionnaire) was assessed using a score inspired by the study by Niyonsenga et al. (14). Each correct answer was worth 1 point, and each incorrect answer was worth 0 points. The first two questions of section 2 were not scored; these asked participants if they had ever heard of cervical cancer and the source of their information. The maximum score was 42 points. Four categories were defined to classify the level of knowledge: Low (≤ 10 points), Medium (11 to 20 points), Good (21 to 30 points), and Very Good ≥ 31 points).

Regarding risk behaviors, which include practices and/or habits that increase a woman's risk of developing cervical cancer, the authors developed 12 questions, each worth 1 point: age at first sexual intercourse under 18 years, being multiparous, and having had the first child before age 20. The following nine questions were closed-ended, with participants responding with either "yes" or "no". A "yes" answer was worth 1 point, and a "no" answer was worth 0 points. The total possible score for this section was 12 points. Three risk categories were defined to classify risk behaviors: low risk (0–4 points), intermediate risk (5–8 points), and high risk (9–12 points).

Cervical cancer screening was assessed using a closed-ended question that asked participants to respond with either "yes" or "no." Those who answered "yes" and had been screened within the past three years were considered to have regular screening practices. If the test was older than three years, it was considered irregular. The third and fourth questions are additional responses regarding the test performed and the screening location.

To ensure the feasibility of the questionnaire, it was first evaluated by a group of obstetricians and gynecologists and then tested on a small, randomly selected group of women to assess their understanding of the questions. Modifications were made to the questionnaire before the final study began. Pretest data were not included in the final analysis.

Statistical analysis The data were analyzed using Epi Info 7.2.6.0 and SPSS 26. First, a descriptive analysis was performed to present the sociodemographic profile. Frequency tables were used for qualitative variables, and measures of central tendency and dispersion were used for quantitative variables. A bivariate analysis was then conducted to determine any possible relationship between women's knowledge, attitudes, and practices and the factors that could explain these responses using Epi Info. The interpretation of cross-tabulated tables, validated by significance tests such as chi-square and Fisher's exact test at the 5% threshold, allowed conclusions to be drawn.

Finally, all variables in the bivariate model with a P-value ≤ 0.2 were included in a final multivariate model in SPSS 26 to determine the factors that could predict women's screening practices and cervical cancer awareness. Ordinal logistic regression was performed for knowledge level. Binary logistic regression was used for screening. The Cox & Snell and Nagelkerke R^2 values were used to assess the predictive power of the model, verify the individual significance of each parameter, and test the global significance using the Wald test and the likelihood ratio test. To select the optimal model, a stepwise selection method was employed to identify the most significant variables for inclusion in the statistical model.

RESULTS

Sociodemographic Characteristics of Respondents

Of the 333 women who agreed to participate in the study (Table 1), 47.74% were between the ages of 18 and 29. The mean age of participants was 31.78 ± 9.5 years. More than half (58.56%) had completed secondary school, 60.66% were Protestant, and 50.15% were business owner.

Table 1: Sociodemographic Characteristics of Women Attending the Obstetrics and Gynecology Outpatient Clinic at the University Hospital of Mirebalais

Variables	Modalities	Frequency (Percentage)
Age	18- 29 years	159(47.75)
	30- 45 years	142(42.64)
	46 – 60 years	32(9.61)
Marital Status	Single	119(35.74)
	Married	99(29.73)
	Cohabiting	103(30.93)
	Other	12(3.06)
Religion	Catholic	83 (24.92)
	Protestant	202(60.66)
	None	22 (6.61)
	Other	26 (7.81)
Parity	Nulliparous	115(34.53)
	Primiparous	77(23.12)
	Multiparous	141(42.34)
Region of origin	Centre	198(59.46)
	West	91(27.33)
	Other	44(13.21)
Educational level	Unschooled attende	25(7.51)
	Primary	56(16.82)
	Secondary	195(58.56)
	University/Vocational school	57(17.12)
Occupation	Salaried Worker	37(11.11)
	Business owner	167(50.15)
	Student	23(6.91)
	Unemployed	86(25.83)
	Others	20(6.01)
Transportation mode	Walking	30(9.01)
	Motorcycle	214(64.26)
	Bus	89(2673).

Cervical Cancer Awareness and Screening

Among the 333 women (Table 2), 86.19% had heard about cervical cancer, most of them from healthcare workers (47.39%). 96.7% of the women had a low level of knowledge about cervical cancer, only 5.41% could identify Human papilloma virus (HPV) as the leading cause of cervical cancer, 63.36% could not name a risk factor for cervical cancer, and only 1.5% could name more than three risk factors. The most common risk factor was a history of sexually transmitted diseases (22.2%).

Table 2: Cervical cancer knowledge, risk behaviors, and practices of women attending the obstetrics and gynecology outpatient clinic at the University Hospital of Mirebalais (August 1-31, 2023).

Variables	Modalities	Frequency(Percentage)
Knowledge about cervical cancer among women attending the external obstetrics and gynecology service of the University Hospital of Mirebalais.		
Awareness of Cervical Cancer	Yes	287(86.2)
	No	46(13.8)
Source of Information (n=287)	Healthcare personnel	136(47.39)
	Radio/ Television	41(14.29)
	Social Media	11(3.83)
	Other	99(34.490
Knowledge of the Cause of the Disease	Yes	18(5.41)
	No	315(94.59)
Knowledge of the risk factors	No known risk factor	181(54.35)
	At least 1 known risk factor	152(45.65)
Knowledge of Symptoms	No known symptom	181(54.35)
	At least 1 known symptom	152(45.65)
Knowledge that Prevention is Possible	Yes	201(60.36)
	No	132(39.640
Knowledge of Prevention Methods	No known prevention method	239(71.77)
	At least 1 known prevention method	94(28.23)
Awareness of the Vaccine	Yes	38(11.41)
	No	295(88.59)
Knows the name of the vaccine	Yes	0(0)
	No	333(100)
Knows where to get screened	Yes	88(26.4)
	No	163(73.6)
knowledge of screening tests	No known of screening test	179(53.75)
	Know at least 1 screening test	154(46.25)
Know when to start screening	Yes	15(4.2)
	No	318(95.8)
Know when to retest.	Yes	11(3)
	No	322(97)
Belief that cervical cancer is treatable	Yes	147(44.14)
	No	186(55.86)
Knowledge level	Low level	322(96.7%)
	Medium level	10(3%)
	Good level	1(0.3%)
	Very good level	0(0%)
Risk behaviors of women attending the external obstetrics-gynecology service at the University Hospital of Mirebalais		
Risk behaviors of women	Low-risk behaviors (0-4)	194(58.25)
	Intermediate-risk behaviors (5-8)	136(40.84)
	High-risk behaviors (9-12)	3(0.009)
Practices of women attending the Obstetrics and Gynecology Service of the University Hospital of Mirebalais.		
Already had a screening test	Yes	122(36.64)
	No	211(63.36)
Have a regular practice	Yes	100(82)

	No	22(18)
Type of Screening Test Performed	Visual Inspection with Acetic Acid (VIA)	56(46)
	Pap test	55(45)
	HPV	8(6.6)
	Unspecified Test	3(2.4)
Barriers to cervical cancer screening reported by women attending the obstetrics-gynecology outpatient clinic at Mirebalais University Hospital		
Barriers reported(n=211)	Lack of information about cervical cancer	91(43)
	Willful neglect	29(13.7)
	Test not required	24(11.4)
	Think they are not old enough	15(7.1)
	Unknown screening location	13(6)
	None	12(5.8)
	Lack of money	6(2.8)
	Screening location too far from home	3(1.4)
	Fear of the outcome	3(1.4)
	Fear of embarrassment during the test	3(1.4)
	Fear of pain related to the procedure	3(1.4)

According to Table 2, more than half of the women (54.95%) could not identify any symptoms related to cervical cancer. The most common symptom (28.5%) was persistent lower abdominal pain, followed by non-menstrual vaginal bleeding (18.9%). Regarding prevention, 60.36% believed that cervical cancer could be prevented, and 11.4% said there was a vaccine that could protect them against cervical cancer, but none could identify the vaccine. 71.77% of the women were unable to identify any preventive measures.

The most known measure was the use of condoms during sexual intercourse (11.7%). 26.4% could identify a screening site. Only 15 women (4.2%) knew the recommended age to start screening, according to WHO. 46.25% could identify at least one cervical cancer screening test, the most known being the Pap test (48%). 3% knew when to repeat the test, and 44.14% believed that cervical cancer could be treated if detected at an early stage.

Risk behaviors, practices, and barriers to screening among women attending the obstetrics-gynecology department

Regarding risk behaviors, 58.25% had low-risk behaviors (Table 2). Among them, 94% had unprotected sexual intercourse, 66.66% had an uncircumcised partner, 56.45% had been previously treated for STI, 45.6% had a high-risk sexual partner, 43.2% had early sexual intercourse, 22.5% had an early pregnancy, 6.9% had a family history of cervical cancer, 2.4% had a history of precancerous lesions, and 1% smoked.

The prevalence of screening among the women was 36.64%: 56 women had an VIA, 55 had a Pap test, and 8 had an HPV test. Three participants could not identify which test they had had. Of the 122 women who had been screened, 100 had regular screening practices, and 22 had irregular practices (Table 2). The most common barrier (n = 211) reported by participants was a lack of information about cervical cancer (43%), followed by willful neglect (13.7%) (Table 2).

Association Between Sociodemographic Characteristics, Knowledge, Risk Behaviors, and Screening Practices

The study found a significant association between knowledge and education level (P = 0.003). A significant association was also found between risk behaviors and education (P = 0.00) and occupation (P = 0.005).

Education level (P = 0.01), marital status (P = 0.004), religion (P = 0.03), age (P = 0, Kramer's V = 0.349) (Table 3), knowledge level (P = 0.003), and risk behaviors (P = 0.004) were significantly associated with screening practices (Table 3, 4).

In the multivariate analysis (Table 5), we observed that compared with a woman who has completed secondary education, a woman who has completed higher education (P=0.04, Odd ratio: 4.241, 95% Confidence interval(CI); 1.071, 16.775) had 4 times the odds of having a better knowledge score about cervical cancer and its screening.

The model obtained from the multivariate analysis explained 23.1% of the variance in women's practices regarding cervical cancer and screening. Compared with women aged 46-60 years, women aged 18-29 years were 11 times more likely (P = 0.000, Odds ratio: 11.008, 95% CI; 4.45, 27.229), and those aged 30-45 years were 3.6 times more likely (P = 0.004, Odds ratio: 3.636, 95% CI; 1.498, 8.821) to have been screened for cervical cancer.

Women with low knowledge were 13 times more likely (P = 0.017, Odds Ratio: 13.200, 95% CI; 1.573, 110.755) to be screened than women with medium knowledge. In addition, women with low-risk behaviors (P = 0.008, Odds ratio: 0.499, 95% CI;0.298, 0.836) were 50% less likely to be screened for cervical cancer than women with intermediate-risk behaviors.

Table 3: Bivariate Analysis of the Sociodemographic Variables with knowledge, risk behaviors and screening practices regarding cervical cancer among women attending the obstetrics-gynecology outpatient service at the University Hospital of Mirebalais

Variables		Knowledge on Cervical Cancer			P-value	Risk Behaviors			P-value	Sreening Practice	
	Modalities	Good	Medium	Low		Low	Intermediate	High		Not screened	Screened
Age	18- 29 years	0 (0)	3 (1.89)	156 (98.11)	0.31 Fisher	94 (59.12)	65 (40.88)	0 (0)	0.48 Fisher	125 (78.62)	34 (21.38)
	30- 45 years	1 (0.7)	5 (3.52)	136 (95.77)		80 (56.34)	59 (41.55)	3 (2.11)		78 (54.93)	64 (45.07)
	46-60 years	0 (0)	2 (6.25)	30 (93.65)		20 (62.5)	12 (37.5)	0 (0)		8 (25)	24 (75)
Religion	Catholic	0 (0)	1 (1.2)	82 (98.8)	0.2 Fisher	45 (54.22)	38 (45.78)	0 (0)	0.21 Fisher	50 (60.24)	33 (39.76)
	Protestant	1 (0.5)	6 (2.97)	195 (96.53)		121 (59.9)	79 (39.11)	2 (0.99)		132 (65.35)	70 (34.65)
	Others	0 (0)	3 (11.54)	23 (88.46)		19 (73.08)	7 (26.92)	0 (0)		11 (42.31)	15 (57.69)
	None	0 (0)	0 (0)	22 (100)		10 (45.45)	11 (50)	1 (4.55)		18 (81.82)	4 (18.18)
Education level	Unschooled	1 (4)	0 (0)	24 (96)	0.003 Fisher	8 (32)	17 (68)	0 (0)	0.00 Fisher	14 (56)	11 (44)
	Primary level	0 (0)	0 (0)	56 (100)		24 (42.86)	32 (57.17)	0 (0)		30 (53.57)	26 (46.43)
	Secondarylevel	0 (0)	4 (2.05)	191 (97.95)		115 (58.97)	77 (39.49)	3 (1.54)		138 (70.77)	57 (29.23)
	University/Vocatio-nal school	0 (0)	6 (10.53)	51 (89.47)		48 (84.21)	9 (15.79)	0 (0)		29 (50.88)	28 (49.12)
Department of origin	Centre	0 (0)	4 (2.02)	194 (97.98)	0.2 Fisher	118 (59.6)	79 (39.9)	1 (0.51)	0.17 Fisher	130 (65.66)	68 (34.34)
	West	1 (1.1)	5 (5.49)	85 (93.41)		47 (51.65)	43 (47.27)	1 (1.1)		60 (65.93)	31 (34.07)
	Others	0 (0)	1 (2.27)	43 (97.73)		30 (68.18)	13 (29.55)	1 (2.27)		21 (47.73)	23 (52.27)
Marital status	Married	1 (1.01)	6 (6.06)	92 (92.93)	0.07 Fisher	92 (92.93)	6 (6.06)	1 (1.01)	0.07 Fisher	51 (51.52)	48 (48.48)
	Cohabiting	0 (0)	0 (0)	103 (100)		103 (100)	0 (0)	0 (0)		66 (64.08)	37 (35.92)
	Single	0 (0)	4 (3.36)	115 (96.64)		115 (96.64)	4 (3.36)	0 (0)		88 (73.95)	31 (26.05)
	Others	0 (0)	0 (0)	12 (100)		12 (100)	0 (0)	0 (0)		6 (50)	6 (50)
Occupation	Student	0 (0)	2 (8.7)	21 (93.3)	0.28 Fisher	21(91.30	2 (8.70)	0 (0)	0.0051 Chi2	19 (82.61)	4 (17.39)
	Business owner	0 (0)	3 (1.8)	164 (98.2)		94 (56.29)	72 (43.11)	1 (0.60)		104 (62.28)	63 (37.72)
	Salaried Worker	0 (0)	1 (2.7)	36 (97.3)		28 (75.68)	9 (24.32)	0 (0)		19 (51.35)	18 (48.65)
	Unemployed	1(1.16)	4 (4.65)	81 (94.19)		42 (48.84)	42 (48.84)	2 (2.33)		57 (66.28)	29 (33.72)
	Others	0 (0)	0 (0)	20 (100)		42 (48.84)	11 (55)	0 (0)		12 (60)	8 (40)
						9 (45)					
Transportation mode	Walking	0 (0)	2 (6.67)	28 (93.33)	0.24 Fisher	15 (50)	14 (46.67)	1 (3.33	0.11 Fisher	18 (60)	12 (40)
	Motorcycle	0 (0)	5 (2.34)	209 (97.66)		127 (59.35)	87 (40.65)	0 (0)		145 (67.76)	69 (32.24)
	Bus	1(1.12)	3 (3.37)	85 (95.51)		53 (59.55)	34 (38.2)	2 (2.25)		48 (53.93)	41 (46.07)
Parity	Nulliparous	0 (0)	4 (3.48)	111 (96.52)	0.8					87 (75.65)	28 (24.35)
	Primiparous	0 (0)	1 (1.3)								

	Multiparous	1(0.71)	5 (3.55)	76 (98.7)	Fisher		45 (58.44)	32 (41.56)
				135 (95.94)			79 (56.03)	62 (43.97)

Table 4: Association of knowledge level and risk behaviors with cervical cancer screening.

Variables	Modalities	Screening Practice		P-Value
		Not screened	Screened	
Knowledge level	Low	210 (65.62)	112 (34.78)	
	Medium	1 (10)	9 (90)	0.0003
	Good	0 (0)	1 (100	Fisher
Risks behaviors	Low	111 (57.22)	83 (42.78)	0.0043
	Intermediate	99 (72.79)	37 (27.21)	Fisher
	High	1 (33.33)	2 (66.67)	

Table 5: Multivariate analysis of potential determinants with knowledge about cancer and screening practice among women attending the obstetrics-gynecology outpatient service at the University Hospital of Mirebalais

Variables	Modalities	Knowledge about cervical cancer		Screening practice	
		P value	Odd ratio(Confidence interval)	P value	Odd ratio(Confidence interval)
Age	18- 29 years			0.00	11.008 (4.45, 27.229)
	30- 45 years			0.004	3.636 (1.498, 8.821)
	46 – 60 years(Ref)				
Marital Status	Single(Ref)				
	Married	0.41	1.786(0.442, 7.22)		
	Cohabiting	0.52	0.468(0.045, 4.841)		
	Other	0.89	0.727(0.011, 47.365)		
Religion	Catholic	0.87	0.864(0.146, 5.107)		
	Protestant(Ref)				
	None	0.57	0.129(0.002, 8.012)		
	Other	0.15	3.124(0.653, 14.949)		
Region of origin	Centre(Ref)				
	West	0.21	2.428(0.6, 9.829)		
	Other	0.91	0.891(0.109, 7.269)		
Educational level	Unschooled	0.135	0.00245(0.000013, 0.425)		
	Primary	0.40	0.084(0.001, 5.423)		
	Secondary (Ref)				
	University/Vocational school	**0.04**	**4.241(1.071, 16.775)**		
Knowledge level	Low			**0.017**	**13.2 (1.573, 110.755)**
	Medium(Ref)				
	Good			1	
Risk Behaviors	Low-risk			**0.008**	**0.499 (0.298, 0.836)**
	Intermediate-risk(Ref)				
	High-risk			0.263	0.247 (0.021, 2.85)

DISCUSSION

The aim of this study was to assess Haitian women's knowledge, risk behaviors, and screening practices related to cervical cancer. These elements are critical to understanding the persistent burden of cervical cancer in the country. In a context marked by limited access to health services and low awareness of preventive measures, such data provide valuable insight into the gaps that must be addressed to improve early detection and reduce mortality.

The sociodemographic profile of the 333 participants in our study is generally consistent with that of the Haitian female population as described in EMMUS-VI (11). More than half (51.8%) were under 30 years of age, with a mean age of 31.8 years, which is comparable to the 30.4 years reported in the study by Assoumou et al. (15). Regarding educational level, 58.6% of participants had completed secondary education, a proportion similar to that reported in Zimbabwe (51.3%), Iran (53.2%), and Cameroon (61.3%) (16–18). Furthermore, 35.7% of the women were single, compared to 50.4% in Assoumou et al. (15), and 65.5% had at least one child, which is slightly lower than the 71.9% reported in Narayana's study in India (19).

The level of knowledge about cervical cancer was found to be low in our sample, consistent with the findings of other studies conducted in Tunisia, Tanzania, Gabon, Turkey, and Indonesia (1, 15, 20-22). This alarming observation highlights the significant lack of education and awareness about this crucial health issue in Haiti. Although the vast majority of women (86.2%) had heard of cervical cancer, a rate comparable to studies by Almobarak in Sudan (87.8%) (9) and Halle-Ekane in Cameroon (82.2%) (23), their specific knowledge of causes, risk factors, and symptoms were minimal. The primary source of information cited was health professionals, as also reported in Iran and Ethiopia (18,20).

Most participants were unaware of the human papilloma virus (HPV) as the primary causative agent of cervical cancer, and very few had heard of vaccination or available screening tests. These results are consistent with findings from similar contexts. Studies conducted in sub-Saharan Africa, including

in Rwanda and Cameroon, have also shown a widespread lack of awareness about the link between HPV and cervical cancer (14,18). Regarding risk factors, only 36.6% of participants were able to identify at least one, with sexually transmitted infections (STIs) being the most frequently mentioned (24.9%). This remains lower than figures reported in Cameroon, where 41.4% of women identified at least one risk factor, and 44.7% specifically cited STIs (18). Concerning symptoms, 45.6% of respondents were able to name at least one, with persistent abdominal pain being the most commonly reported (31.9%), followed by vaginal bleeding (21.1%). In comparison, a study by Nyonsenga et al. in Rwanda found higher awareness of vaginal bleeding (26.4%) as the primary symptom (14). These results may reflect the fact that such symptoms are among the most frequently observed when cervical cancer becomes clinically apparent (24).

Knowledge of screening methods was also inferior, with only 46.25% of women being able to identify a screening method (48% for the Pap test), significantly lower than in Nyamambi's study in Zimbabwe, where 93.6% knew about VIA (16), but higher than in Ethiopia, where only 6.7% of women had heard of the Pap test (25). The relatively better knowledge of the Pap test in our study may be attributed to its widespread use as the most commonly employed screening method in Haitian health facilities, particularly in the private sector, where frequent screening campaigns are organized throughout the year. However, only 3% of women knew how often to retest, a rate significantly lower than the 7.6% reported in Ethiopia (25) and 56.3% in Turkey (21).

With regard to vaccination, only 11.41% of participants were aware that a vaccine exists to protect against cervical cancer, a proportion that remains significantly lower than reported in Turkey (17.1%) (21), Sudan (39.2%) (9), and India (74.7%) (19). None of the women, however, were able to name the vaccine. This limited awareness may be linked to the unavailability of the HPV vaccine in Haiti and the absence of a national vaccination policy. Despite this knowledge gap, 44.1% of respondents believed that cervical cancer could be treated if detected early, a much lower figure than the 77.6% observed in the Sudanese study by Almobarak et al. (9). In contrast, a striking 92% of participants in the study by Ebu et al. believed that cervical cancer could neither be prevented nor treated (26).

Our study revealed alarming levels of high-risk sexual behaviors among participants: 94% reported engaging in unprotected sex, 66.66% had sexual partners who were uncircumcised, 56.45% had been treated for a sexually transmitted infection (STI), 45.6% had high-risk sexual partners, 43.2% reported early sexual initiation, and 22.5% experienced early pregnancy. These figures are considerably higher than those reported in the 2016 Haitian Demographic and Health Survey (EMMUS VI) (11), where 14% of women aged 25–49 had a high-risk sexual partner, 16% had an early pregnancy, and 30% reported having had an STI. This discrepancy may be partly explained by participants' limited knowledge of cervical cancer risk factors with 63.36% were unable to identify even one. These risk behaviors were also linked to educational level. As noted in EMMUS VI, higher education levels were associated with more responsible sexual behavior (11). These findings underscore the urgent need to strengthen health education, particularly for women with lower levels of schooling, in order to promote safer sexual practices and ultimately reduce cervical cancer risk.

The cervical cancer screening rate observed in our study was 36.6%, which is relatively high compared to findings from other studies conducted in similar settings. For instance, the EMMUS VI reported a screening rate of only 11% (11). Rates reported in India ranged between 5.3% and 13.4% (19,28), while studies in Cameroon found rates between 4.8% and 7.4% (18,23). Other countries also reported lower rates: 22.1% in Tunisia (1), 15.8% in Sudan (9), and 28.3% in Rwanda (14). These comparisons highlight a relatively better, but still insufficient uptake of cervical cancer screening in our study population.

This encouraging result can largely be attributed to the fact that the hospital where the study was conducted is a designated cervical cancer screening center, which may facilitate access to screening services and increase awareness among women. Nevertheless, this rate remains generally insufficient (27), especially considering the national context. Additional efforts are urgently needed to promote cervical cancer screening at the population level through awareness campaigns, integration of screening into routine health services, and outreach in underserved communities.

Our study found a significant association between higher educational level and better knowledge of cervical cancer. This result aligns with findings from a study conducted in Cameroon, where education was also identified as a key determinant of awareness about the disease (18). However, a contrasting study in Ethiopia highlighted other influential factors, such as marital status (being single), occupation, monthly income, having received information from healthcare professionals, and knowing someone diagnosed with cervical cancer (25). The observed relationship in our study may be attributed to the fact that women with higher levels of education are more likely to access and comprehend health-related information, including complex topics such as sexual and reproductive health. Educational attainment may thus enhance their capacity to understand the etiology, risk factors, and prevention strategies related to cervical cancer.

Screening among women was significantly associated with younger age, intermediate-risk behavior, and low knowledge. These results differ from the conclusions of a study in Burkina Faso, where higher salary, older age, education level, and motivation from a health care provider (28) were associated with screening, and in Indonesia, where other variables also emerged as factors favoring screening, such as menarche at age 14 or older, higher socioeconomic and educational levels, urban residence, menopause, household expenditure, health insurance coverage, and the presence of comorbidities (29). Although the study results showed a higher screening rate among women with a low level of knowledge, this observation could be explained by an institutional bias related to the context of data collection. In fact, in the department where the study was conducted, a systematic screening policy is implemented, according to which every woman of age to benefit from the test is offered screening during her consultation, regardless of her level of knowledge or explicit request. Thus, screening uptake does not correlate with an informed initiative on the part of patients but rather with a standardized practice by health professionals. This situation may have masked the actual influence of knowledge level on screening behavior, making the interpretation of this association more complex.

The main barriers to screening reported by women in our study are consistent with those identified in many other low- and middle-income countries (14,16,25,30-32): lack of information and awareness about cervical cancer, its severity, and the importance of screening; neglect and perception of low personal risk; fear of results; geographical and financial difficulties to access screening services; and cultural barriers such as embarrassment or anticipated pain during sample collection. This lack of information and understanding of the pathology thus appears to be a significant barrier to cervical cancer screening everywhere, including Haiti, according to our results.

Intensive awareness campaigns through all channels (media, social networks, community relays, civil society) are essential to fill these gaps and help women understand the risks and the critical importance of early screening. Fear of the results also underscores the importance of clearly explaining the steps in the care process and treatment options in the event of early detection. In parallel, physical and financial barriers to accessing screening services must be addressed.

Study strengths and limitations

The main strength of our study lies in its rigorous methodology, which includes primary data collection and a large sample of 333 participants, enabling statistically robust results. The hospital serves as a screening site also allowed for the observation of a relatively high screening rate compared to other contexts. However, some limitations should be noted, including the fact that the sample of participants may not be fully representative of all Haitian women. In addition, the non-probability sampling method used limits the ability to generalize these preliminary results to the entire female population of the country. Larger studies, ideally in the general population, would be needed to confirm these trends and provide a better understanding of how to guide interventions. The extensive network of Zanmi Lasante facilities could be a valuable asset for future research on this important public health issue in Haiti.

CONCLUSION

This study highlights significant gaps in knowledge about cervical cancer among Haitian women and an effective screening rate that is still too low despite an encouraging rate of 36.6% at this hospital site. Coordinated, multisectoral, and intensive awareness campaigns targeting the female population, involving all relevant stakeholders and communication channels, appear essential to achieve tangible improvements in primary prevention, screening, and early detection of cervical cancer in Haiti. These efforts must be accompanied by increased access to screening and care infrastructure and services. Following the implementation of these comprehensive interventions, it will be essential to conduct new large-scale studies, preferably in the general population, to rigorously evaluate their impact on awareness and actual screening practices among Haitian women for this preventable disease. (1)

Abbreviations

CI: Confidence IntervalEMMUS-VI: The 2016 Haitian Demographic and Health SurveyUSPSTF: United States Preventive Services Task ForceHPV: Human Papilloma VirusVIA: Visual inspection with acetic acidWHO: World Health OrganizationSTI: Sexually Transmitted Infections

Declarations

Acknowledgments The authors would like to thank Dr. Nazaire Maky-Kenson, Head of the Department of Obstetrics and Gynecology at the University Hospital of Mirebalais, as well as Mr. Etienne Vernet, from the hospital's Education Department and all the participants, for their support and assistance throughout the project.

Ethics approval and consent to participate The study was conducted according to the ethical standards set out in the Declaration of Helsinki of 1964 and its subsequent amendments, and the Belmont Report on the Protection of Human Subjects. We obtained approval from the Laboratory of Medicine, Ethics, and Society at the Faculty of Medicine and Pharmacy, State University of Haiti. The research protocol was also approved by the Zanmi Lasante Institutional Review Board under reference number ZLIRB07212023. Written informed consent, provided in Haitian Creole and detailing the purpose of the study, was obtained from each participant prior to data collection.

Consent to publication declarations The authors certify that they have obtained all appropriate patient consent forms. In these forms, the patients gave their consent for the collection and reporting of clinical and sociodemographic information in the article. The patients understand that no identifiable data were collected as part of this study, and that all necessary precautions were taken to ensure the confidentiality and anonymity of the information gathered.

Conflict of Interest The authors declare no conflicts of interest.

Funding Declaration This study was self-funded by the authors.

Contributions of the authors WG and JF contributed to the writing of the protocol, data collection, entry, analysis and writing of the article. JJ contributed to data analysis and article writing. CM and FDJ supervised and reviewed the writing of the protocol, data analysis, and writing of the article.

Availability of data and materials

The datasets generated and analyzed during the current study are not publicly available due to confidentiality agreements with the participants but are available from the corresponding author on reasonable request. Requests for access to the data can be sent to:woguerrier@pih.org.

References

1. Bouslah S, Soltani MS, Ben Salah A, Sriha A. Knowledge, attitudes, and practices of Tunisian women regarding breast cancer and cervical cancer screening. Psycho-Oncology. 2014;8(2):123–32. https://doi.org/10.1007/s11839-014-0460-8
2. Sung H, Ferlay J, Siegel RL, Laversanne M, Soerjomataram I, Jemal A, et al. Global Cancer Statistics 2020: GLOBOCAN Estimates of Incidence and Mortality Worldwide for 36 Cancers in 185 Countries. CA Cancer J Clin. 2021;71(3):209–49. https://doi.org/10.3322/caac.21660 .

3. Paul P, Winkler JL, Bartolini RM, Penny ME, Huong TT, Nga LT, et al. Screen-and-Treat approach to cervical cancer prevention using visual inspection with acetic acid and cryotherapy: Experiences, perceptions, and beliefs from demonstration projects in Peru, Uganda, and Vietnam. Oncologist. 2013; 18:1278–84. https://doi.org:/10.1634/theoncologist.18-S2-6 .
4. Swapnajaswanth M, Suman G, Suryanarayana SP, Murthy NS. Perception and practices on screening and vaccination for cervical carcinoma among female healthcare professionals in tertiary care hospitals in Bangalore, India. Asian Pacific J Cancer Prev. 2014;15(15):6095–8. https://doi.org/10.7314/apjcp.2014.15.15.6095
5. WHO. Comprehensive Cervical Cancer Control. Geneva. 2014. 366–378 p. Available from: https://www.ncbi.nlm.nih.gov/books/NBK269619/
6. Ministry of Public Health and Population (MSPP). Statistical Report 2022. 2023;1–109. Available from: https://mspp.gouv.ht/site/downloads/Rapport%20Statistique%20MSPP%202022.pdf
7. Ministry of Public Health and Population (MSPP). Family Health Directorate DSF/MSPP NATIONAL STRATEGIC PLAN FOR SEXUAL AND REPRODUCTIVE HEALTH 2018-2022. 2018 [Internet]. 2018;1–40. Available from: http://ec2-54-210-230-186.compute-1.amazonaws.com/wpcontent/uploads/2018/09/Document-PSNSSR-2018-2022_V.finale-2017.pdf
8. WHO. Cervical cancer profile. 2021;(2020). Available from: https://www.who.int/teams/noncommunicable-diseases/surveillance/data/cervical-cancer-profiles
9. Almobarak AO, Elbadawi AA, Elmadhoun WM, Elhoweris MH, Ahmed MH. Knowledge, attitudes, and practices of Sudanese women regarding the Pap smear test and cervical cancer. Asian Pacific J Cancer Prev. 2016;17(2):625–30. https://doi.org/10.7314/apjcp.2016.17.2.625
10. Leung SSK, Leung I. Cervical cancer screening: Knowledge, health perception, and attendance rate among Hong Kong Chinese women. Int J Womens Health [Internet]. 2010;2(1):221–8. https://doi.org/10.2147/ijwh.s10724
11. IHE/Haiti & ICF. Haiti Mortality, Morbidity, and Utilization of Services Survey 2016-2017 - EMMUS-VI". [Internet]. The DHS program ICF Rockville, Maryland, USA. 2018. Available from: IHE/Haiti & ICF, "Haiti Mortality, Morbidity, and Utilization of Services Survey 2016-2017 - EMMUS-VI". Pétion-Ville/Haiti: IHE/Haiti, ICF, 2028.http://dhsprogram.com/pubs/pdf/FR326/FR326.pdf
12. Guerrier W, Faurestal J, Joseph J, Jacques DF, Millien C. Survey Questionnaire on Women's knowledge, risk behaviors and practices regarding cervical cancer and its screening. 2024.
13. Curry SJ, Krist AH, Owens DK, Barry MJ, Caughey AB, Davidson KW, et al. Screening for cervical cancer: US Preventive Services Task Force recommendation statement. JAMA - J Am Med Assoc. 2018;320(7):674–86. https://doi.org/10.1001/jama.2018.10897
14. Niyonsenga G, Gishoma D, Sego R, Uwayezu MG, Nikuze B, Fitch M, et al. Knowledge, use, and barriers to cervical cancer screening in district hospitals in Kigali, Rwanda. Can Oncol Nurs J. 2021;31(3):275–84. https://doi.org/10.5737/23688076313266274
15. Assoumou SZ, Mabika BM, Mbiguino AN, Mouallif M. Awareness and knowledge regarding cervical cancer, Pap smear screening, and human papillomavirus infection in Gabonese women. BMC Womens Health [Internet]. 2015;15–37. https://doi.org/10.1186/s12905-015-0193-2
16. Nyamambi E, Murendo C, Sibanda N. Knowledge, attitudes, and barriers to cervical cancer screening among women in Chegutu rural district of Zimbabwe. Cogent Soc Sci [Internet]. 2020;6(1). https://doi.org/10.1080/23311886.2020.1766784
17. Ashtarian H, Mirzabeigi E, Mahmoodi E. Knowledge about Cervical Cancer and Pap Smear and the Factors Influencing the Pap test Screening among Women. IJCBNM. 2017;5(2):188–95. https://pmc.ncbi.nlm.nih.gov/articles/PMC5385241/
18. Dakenyo RD, Kenfack B, Vogue N, Tsakoue EF, Ebode ME, Cumber SN. Knowledge, attitudes, and practices of women of childbearing age regarding cervical cancer preventive measures in the MIFI health district, Cameroon. Pan Afr Med J. 2018;31(172). https://doi.org/10.11604/pamj.2018.31.172.16320
19. Narayana G, Suchitra MJ, Sunanda G, Ramaiah JD, Kumar BP VK. Knowledge, attitude, and practice toward cervical cancer among women attending Obstetrics and Gynecology Department: A cross-sectional, hospital-based survey in South India. Indian J Cancer. 2017;54(1):481–7. https://doi.org/10.4103/ijc.IJC_251_17.
20. Bateman LB, Blakemore S, Koneru A, Mtesigwa T, McCree R, Lisovicz NF, et al. Barriers and Facilitators to Cervical Cancer Screening, Diagnosis, Follow-Up Care and Treatment: Perspectives of Human Immunodeficiency Virus-Positive Women and Health Care Practitioners in Tanzania. Oncologist. 2019;24(1):69–75. https://doi.org/10.1634/theoncologist.2017-0444
21. Reis N, Bebis H, Kose S, Sis A, Engin R, Yavan T. Knowledge, behavior, and beliefs related to cervical cancer and screening among Turkish women. 2012;13:1463–70. https://doi.org/10.7314/apjcp.2012.13.4.1463
22. Rina B, Spagnoletti M, Bennett LR, Wahdi AE, Wilopo SA, Keenan CA. A Qualitative Study of Parental Knowledge and Perceptions of Human Papillomavirus and Cervical Cancer Prevention in Rural Central Java, Indonesia: Understanding Community Readiness for Prevention Interventions. 2019;20:2429–34. https://doi.org/10.31557/apjcp.2019.20.8.2429
23. Halle-Ekane GE, Nembulefack DK, Orock GE, Fon PN, Tazinya AA, Tebeu PM. Knowledge of Cervical Cancer and Its Risk Factors, Attitudes and Practices towards Pap Smear Screening among Students in the University of Buea, Cameroon. J Cancer Tumor Int. 2018;7(4):1–11. https://doi.org/10.9734/JCTI/2018/43965
24. Busingye P, Nakimuli A, Nabunya E, Mutyaba T. Acceptability of cervical cancer screening via visual inspection with acetic acid or Lugol's iodine at Mulago Hospital, Uganda. Int J Gynecol Obstet. 2012 December 1;119(3):262–5. https://doi.org/10.1016/j.ijgo.2012.06.015
25. Getachew S, Eyerusalem G, Gizaw M, Ayele W, Addissie A, Kantelhardt JE. Cervical cancer screening knowledge and barriers among women in Addis Ababa. PLoS One. 2019;7:1–13. https://doi.org/10.1371/journal.pone.0216522

26. Ebu NI, Mupepi SC, Siakwa MP. Knowledge, practice, and barriers toward cervical cancer screening in Elmina, Southern Ghana. Int J Womens Health. 2015;7:31–9. https://doi.org/10.2147/IJWH.S71797

27. WHO. Global strategy to accelerate the elimination of cervical cancer as a public health problem [Internet]. 2020. License: CC BY-NC-SA 3.0 IGO. http://apps.who.int/iris.

28. Compaore S, Ouedraogo CMR, Koanda S, Haynatzki G, Chamberlain RM, Soliman AS. Barriers to Cervical Cancer Screening in Burkina Faso: Needs for Patient and Professional Education. Physiol Behav. 2018;176(1):139–48. https://doi.org/10.1007/s13187-015-0898-9

29. Anwar SL, Tampubolon G, Van Hemelrijck M, Hutajulu SH, Watkins J, Wulaningsih W. Determinants of cancer screening awareness and participation among Indonesian women. BMC Cancer. 2018;18(1):1–11. https://doi.org/10.1186/s12885-018-4125-z

30. Mafiana JJ, Dhital S, Halabia M, Wang X. Barriers to uptake of cervical cancer screening services in low-and-middle-income countries: a systematic review. Afr Health Sci [Internet]. 2022;22(2):295–309. https://doi.org/10.1186/s12905-022-02043-y

31. Nwobodo H, Ba-Break M. Analysis of the determinants of low cervical cancer screening uptake among Nigerian women. J Public Health Africa. 2016;6(2):12–9. https://doi.org/10.4081/jphia.2015.484

32. Mafiana JJ, Dhital S, Halabia M, Wang X. Barriers to uptake of cervical cancer screening among women in Nigeria: a systematic review. Afr Health Sci. 2022;22(2):295–309. https://doi.org/10.4314/ahs.v22i2.33

Supplementary Files

This is a list of supplementary files associated with this preprint. Click to download.

- CervicalCancerKAPQuestionnaireEnglish.docx