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Knowledge, Attitudes, and Practices of Parents of Young Girls regarding Vaccination against Cervical Cancer in Ouagadougou

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Abstract

Introduction: Cervical cancer remains a major public health issue in Sub-Saharan Africa. Understanding parental knowledge, attitudes, and practices is crucial to improving human papillomavirus (HPV) vaccination coverage and reducing the disease burden in Burkina Faso. **Methodology:** A cross-sectional survey was conducted in Ouagadougou from 19 - 28 December 2024 among 403 parents of girls aged 10 - 12. Data were collected using structured face-to-face questionnaires via KoboCollect. Socio-demographic variables, knowledge, attitudes, and vaccination practices were assessed. Bivariate and multivariate analyses identified factors associated with parental acceptance of HPV vaccination. Ethical approval was obtained from the national committee, and interviews were conducted anonymously with informed consent. **Results:** Participants' mean age was 42.8 years, and most were female (87.8%) and married (87.6%). Knowledge about HPV and prevention was limited: while 98.5% had heard of cervical cancer, only 12.4% knew HPV causes it. Overall, 85.1% knew of the vaccine, yet only 53.9% accepted vaccination and 12.7% had already vaccinated their daughters. Multivariate analysis revealed that female sex (OR = 2.4), having a relative who died of cancer (OR = 3.1), awareness that vaccination is free (OR = 9.4), knowledge of vaccination sites (OR = 1.4), belief in effectiveness (OR = 1.9), and rejecting infertility myths (OR = 3.7) were significantly associated with acceptance. **Conclusion:** HPV vaccination acceptance among parents in Ouagadougou remains suboptimal, despite general awareness of cervical cancer. Misconceptions, insufficient knowledge, and practical

barriers limit uptake. Strengthening communication, addressing myths, and promoting accessibility are essential strategies to increase vaccination coverage and ultimately reduce the cervical cancer burden in Burkina Faso.

Keywords

Vaccination, Cervical Cancer, Knowledge, Attitudes, Pratices, Ouagadougou

1. Introduction

Cervical cancer is a global public health problem, with around 604,000 new cases and over 350,000 deaths in 2020 [1]. Its incidence has fallen sharply over the decades in developed countries. In some countries, such as Switzerland, the age-standardised incidence is now less than 5 cases per 100,000 women per year [2]. This steady decline has been observed for over 30 years, mainly due to the introduction of screening in the 1970s, and more recently to vaccination against human papillomavirus (HPV). However, the incidence of HPV is rising in low-income countries. Sub-Saharan Africa has the highest rates in the world. More than half (53.3%) of cervical cancers in Africa are diagnosed at an advanced stage (stages III-IV), with very poor five-year survival [3]. Burkina Faso is particularly affected, with an annual incidence of 18.8 cases per 100,000 women [4]. This cancer is the second leading cause of cancer in women. The high prevalence of HPV, low vaccination coverage, limited screening, and difficult access to treatment explain the high morbidity and mortality associated with this disease [4]. Prevention involves vaccination against human papillomavirus (HPV) and regular screening, which are essential to reduce the incidence of this disease. In Burkina Faso, Gardasil 4 was introduced in April 2022 to vaccinate girls aged 9 to 14. In 2025, a catch-up campaign is planned for girls aged 10 to 18 years. Vaccination uptake is highly dependent on parental knowledge, attitudes, and practices. The aim of this study was to assess these factors among the parents of young girls in Ouagadougou, in order to identify the obstacles to acceptance of the vaccine. The results of the study could be used to propose appropriate communication strategies to boost vaccination coverage and, ultimately, contribute to the elimination of cervical cancer in the country.

2. Methodology

It was an analytical cross-sectional study. It was conducted in the city of Ouagadougou, the capital of Burkina Faso, which is divided into 12 districts, each comprising 4 to 6 sectors. Based on the 5th General Population and Housing Census [5] and a growth rate of 5%, its population is estimated to be 3.5 million inhabitants by 2024. Girls aged 9 to 14 years represent 7% of this population.

The survey took place from 19 to 28 December 2024 and adopted a cross-sectional design for descriptive and analytical purposes, with prospective data collec-

tion. The target population consisted of the parents (father or mother) of girls aged 10 to 12 (therefore who celebrated their 9th birthday between the introduction of the vaccine and the survey), residing in Ouagadougou since 1 July 2022 and having given their informed consent to participate in the study. To conduct this study, we obtained approval from the National Ethics Committee for Health Research under No. 2024-12-385.

Four of the city's twelve arrondissements were selected at random, and then a sector was chosen within each arrondissement, also by drawing lots. Using Google Maps, the centre of each sector was located, and the direction of travel was determined randomly using the pen method. This method consists of standing at a central point within the survey area, tossing a pen onto the ground, and then proceeding towards the concession indicated by the pen's tip, which is chosen as the first concession to visit for the survey. The subsequent households were selected at regular intervals (X + 2, X + 4, etc.) until the required number was reached. Within each household, the mother or father of girls aged 10 to 12 was included.

The sample size was calculated using Cochran's formula, which was adapted for cluster sampling in large populations. Assuming a confidence interval of 95%, a margin of error of 5%, and an estimated proportion of 50%, the minimum sample size obtained was 385, rounded to 403 to include all the girls and their parents met.

Approval was obtained from the national health research ethics committee. Data were collected using a face-to-face questionnaire developed on KoboToolbox and deployed via the KoboCollect application on Android phones. The interviewers, trained specifically for this study, collected the information anonymously and confidentially, after obtaining approval from the national ethics committee. Variables collected included socio-demographic characteristics, knowledge about cervical cancer and HPV vaccination, attitudes towards vaccination, and actual vaccination practices. Socio-economic status was assessed and classified as low, medium, and high.

The data were processed and analysed using R software. Binary logistic regression was used to identify factors associated with acceptance of vaccination. The selection of variables to be included in the multivariate model was based on the results of the univariate analysis ($p < 0.20$). The results of the logistic regression were expressed as Odds Ratios with their 95% confidence intervals, making it possible to assess the strength and direction of the association between each factor and vaccine acceptance (parents who had already vaccinated their daughters and those who intend to do so). The threshold for statistical significance was $p < 0.05$.

3. Results

In total, 412 parents were invited to participate in the study, of whom 403 consented to take part (**Figure 1**).

The study included 403 parents of girls aged between 9 and 14. The average age of the participants was 42.8 ± 9.6 years. Of the respondents, 87.8% were women, 87.6% were living with a partner, 32.8% did not attend school, and 73.9% were in

the middle socio-economic category. Table 1 gives details of the socio-demographic characteristics of the parents.

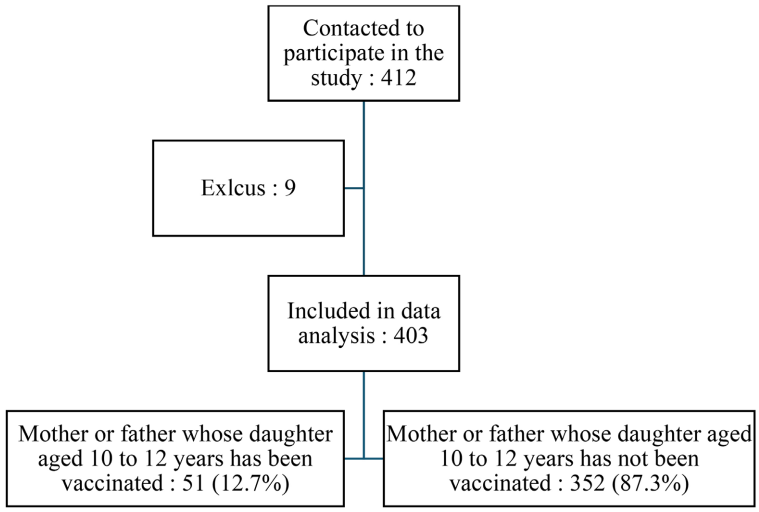

Figure 1. Flow chart shows the number of parents invited to participate, loss to follow-up, parents eligible for inclusion in the survival analysis, and vaccination status of daughter.

Table 1. Parents' socio-demographic characteristics (n = 403).

Socio-demographic characteristics	Number (n = 403) or mean	Percentage (%)
Age (years)		
[20 - 30[	39	9.7
[30 - 40[	123	30.5
[40 - 50[	154	38.2
[50 - 60[	68	16.9
[60 - 70[	18	4.5
[70 - 80[	1	0.2
Mean age	42.8 ± 9.6	-
Gender		
Female	354	87.8
Male	49	12.2
Level of education		
Not schooled	132	32.8
Medium level	202	50.1
Hight level	69	17.2
Marital status		
Married	352	87.6
Single	51	12.4
Socio-economic level		
Low	69	17.1
Medium	298	73.9
High	36	8.9

Of the 403 parents who took part in the study, 98.5% had already heard of the cervical cancer vaccine, 69.0% knew that the vaccine was available free of charge for 9-year-old girls, 72.5% believed in the vaccine's efficacy, 12.7% had had their daughter vaccinated, and 41.2% intended to have their daughter vaccinated (Table 2).

Table 2. Knowledge, perceptions, and practices regarding vaccination against cervical cancer (n = 403).

Variables	n	%
Knowledge		
• Has heard about cervical cancer.	397	98.5
• Already had an acquaintance die of cancer.	271	67.2
• Knows that cervical cancer is caused by HPV infection.	50	12.4
• Knows that there is a vaccine against cervical cancer.	343	85.1
• Knows that the cervical cancer vaccine is available in Burkina Faso.	304	50.6
• Knows that the vaccine is free for girls aged 9 years.	278	69.0
• Knows where to have her daughter vaccinated.	226	56.1
Perceptions		
• Believes in the effectiveness of the vaccine.	292	72.5
• Believes in the safety of the vaccine.	268	66.5
• Other perceptions		
The vaccine causes infertility in girls.	11	2.7
The vaccine is contrary to my religious beliefs.	1	0.2
Practices or attitudes		
• Acceptance of vaccination.	225	53.9
I have already vaccinated my daughter.	51	12.7
I intend to have my daughter vaccinated.	174	41.2

The factors associated with being favorable towards vaccination (Table 3), following a multivariate analysis, included being female, with an odds ratio of 2.4 (1.6 - 5.5, p = 0.0037). Additionally, having a close relative who died of cancer was linked to a higher likelihood of support, with an odds ratio of 3.1 (1.8 - 3.2, p = 0.0017). Awareness that vaccination is free significantly influenced positive attitudes, reflected in an odds ratio of 9.4 (6.2 - 13.5, p < 0.0001). Knowledge of where to vaccinate one's daughter was also important, with an odds ratio of 1.4 (1.1 - 2.4, p = 0.0321). Belief in the vaccine's effectiveness was associated with an odds ratio of 1.9 (1.1- 2.9, p = 0.029), while not believing that the vaccine causes sterility had an odds ratio of 3.7 (1.2 - 19.8, p = 0.024).

Table 3. Factors associated with acceptance of the cervical cancer vaccine (n = 403).

Socio-demographic characteristics	Total	Accept the vaccine (%)	Univariate analysis OR[b] (CI 95%, p)	Multivariate analysis OR[a] (CI 95%, p)
Gender				
Female	354	210 (59.3)	3.3 (1.7 - 6.3, p = 0.0002)	2.4 (1.6 - 5.5, p = 0.0037)
Male	49	15 (30.6)	1	1
Level of education				
Schooled	271	143 (52.8)	1	-
Not schooled	132	82 (62.1)	0.7 (0.5 - 1.1, p = 0.0874)	-
Marital status				
Married	352	196 (55.7)	0.9 (0.5 - 1.7, p = 0.998)	-
Single	51	29 (56.9)	1	-
Socio-economic level				
Medium to high	334	176 (52.7)	1	1
Low	69	49 (71.0)	2.2 (1.3 - 3.9, p = 0.0052)	1.6 (0.9 - 2.7, p = 0.0634)
Has heard about cervical cancer				
Yes	397	223 (56.2)	2.6 (0.5 - 14.2, p = 0.4122)	-
No	6	2 (33.3)	1	-
Already had an acquaintance die of cancer				
Yes	271	166 (61.3)	1.9 (1.3 - 3.0, p = 0.0019)	3.1 (1.8 - 3.2, p = 0.0017)
No	132	59 (44.7)	1	1
Knows that the cervical cancer vaccine is available in Burkina Faso				
Yes	304	198 (65.1)	4.9 (3.0 - 8.2, p < 0.0001)	2.2 (0.9 - 7.3, p = 0.0652)
No	99	27 (27.3)	1	1
Knows that the vaccine is free for girls aged 9 years				
Yes	278	198 (71.2)	8.9 (5.5 - 14.8, p < 0.0001)	9.4 (6.2 - 13.5, p < 0.0001)
No	125	27 (21.6)	1	1
Knows where to have her daughter vaccinated				
Yes	226	141 (75.7)	1.8 (1.2 - 2.7, p = 0.0027)	1.4 (1.1 - 2.4, p = 0.0321)
No	177	84 (30.5)	1	1
Believes in the effectiveness of the vaccine				
Yes	111	52 (46.8)	1	1
No	292	173 (59.2)	1.7 (1.1 - 2.6, p = 0.026	1.9 (1.1 - 2.9, p = 0.029)
Believes in the safety of the vaccine				
Yes	268	149 (55.6)	0.9 (0.6 - 1.5, p = 0.90)	-
No	135	76 (56.3)	1	-

Continued

The vaccine causes infertility in girls				
Yes	392	223 (56.3)	5.9 (1.3 - 27.9, p = 0.019)	3.7 (1.2 - 19.8, p = 0.024)
No	11	2 (27.3)	1	1

OR[a] = Odd Ratio adjusted; OR[b] = Odd Ratio brut or unadjusted odd ratio.

4. Discussion

The issue of vaccination against cervical cancer in Ouagadougou is part of a global context marked by a growing desire for primary prevention, particularly in countries with limited resources where morbidity and mortality remain high [6] [7]. Vaccination against cervical cancer in Ouagadougou is part of a worldwide trend towards prevention, which is particularly essential in resource-limited countries where morbidity and mortality remain high, and is one of the major public health levers for reducing the incidence of cervical cancer [8], but acceptance and coverage vary widely depending on the socio-cultural and economic context.

The study carried out in Ouagadougou among 403 parents revealed a particularly high level of awareness: 98.5% of respondents had already heard of the vaccine, indicating a significant information effort. This finding corroborates the results observed in African countries such as Nigeria [9] and Kenya [10], where awareness rates often exceed 90%. Internationally, surveys in Europe [11] and North America [12] [13] also show that information is widely disseminated, although the sources and quality of messages vary greatly depending on the health systems and national campaigns.

However, a recurring observation in the literature is the persistent gap between the level of knowledge and effective vaccination practices. In Ouagadougou, only 12.7% of parents have actually vaccinated their daughters, while 41.2% express a positive intention. This phenomenon is not unique to Burkina Faso: in Nigeria, Azuogu *et al.* in 2019 [9] reported an adolescent vaccination rate of 1.4%, despite 96% of parents having good awareness of the vaccine's existence. Similarly, in Sweden, Dahlström *et al.* in 2009 [11] observed that the declaration of intention does not always translate into vaccination actions, illustrating the influence of multifactorial barriers. The reasons put forward are varied: logistical access difficulties, lack of information about vaccination sites, actual or perceived costs, and especially the prevalence of beliefs and rumours, some of which, such as the conspiracy theory that the West is attempting to sterilise African populations through vaccination, are particularly persistent in Sub-Saharan Africa [14].

The in-depth analysis of the determinants of vaccination acceptance highlights factors that converge with the international literature. The parent's sex, with an overrepresentation of mothers among those favorable to the vaccine (OR = 2.4), can be attributed to their central role in managing family reproductive health [12]. This finding is corroborated by studies conducted in Switzerland, where mothers are often the primary decision-makers for HPV vaccination [11]. Furthermore, the

experience of a cancer-related death within the family significantly increases adherence (OR = 3.1), underscoring the impact of perceived personal risk: the more the threat of cancer is experienced or felt, the greater the acceptance of the vaccine, as demonstrated by Dahlström *et al.* [11] and Zakhour *et al.* [15] in their work on parental motivations.

Information regarding the vaccine's cost-free availability emerges as the most powerful determinant (OR = 9.4), making it necessary for communication to emphasise that the vaccine is free of charge. This observation corroborates the conclusions of LaMontagne *et al.* [7] and Watson-Jones *et al.* [16], who argue that knowledge of the absence of financial barriers is essential for the success of vaccination programmes in low- and middle-income countries. Geographical accessibility and precise knowledge of vaccination sites (OR = 1.4) also appear to be crucial leverage points: literature highlights that proximity strategies and clear communication about service points can significantly improve vaccination coverage [7]. Moreover, confidence in the vaccine's effectiveness (OR = 1.9) is a universally recognised factor, as evidenced by authors [17]-[20] who emphasise the role of educational campaigns in strengthening the positive perception of the vaccine. Finally, the belief that the vaccine could cause sterility is a major barrier to acceptance, with a significant negative effect: not believing in this myth multiplies the chances of acceptance by 3.7. This type of rumour, extensively documented by Perlman *et al.* [21] and Kutz *et al.* [22], illustrates the detrimental impact of misinformation on public health. Studies conducted in several African countries show that the spread of false information, often conveyed by community leaders or through social networks, hampers vaccination efforts despite the attempts of health authorities. This observation calls for strengthened communication strategies, relying on credible messengers and adapting messages to local cultural realities.

Taking into account the results of our study and relevant literature, several recommendations emerge to enhance adherence to cervical cancer vaccination. It is essential to maintain and amplify informational efforts, particularly targeting parents, especially mothers, whose role is central. Campaigns should emphasise the free availability of the vaccine and provide precise information about vaccination locations, utilising appropriate communication means (local radio, posters, community relays). Furthermore, the fight against misinformation must be reinforced: this involves training healthcare personnel and opinion leaders to disseminate scientific messages and ensuring rapid intervention as soon as a rumour begins to circulate. Lastly, community involvement, through the mobilisation of women's associations, teachers, and religious leaders, constitutes a powerful lever to reassure families and create a favourable environment for vaccination.

5. Conclusion

This study in Ouagadougou has shown that knowledge of the cervical cancer vaccine is high, but vaccination practices remain hindered by multiple factors: eco-

nomic and logistical barriers, beliefs and rumours, risk perception, and trust in vaccination. International comparisons indicate that these determinants are universal; however, they manifest with particular intensity in African contexts. To improve vaccination coverage, it is essential to enhance communication, facilitate access to the vaccine, and actively combat misinformation by mobilising all community and institutional actors. These action pathways are important for achieving cervical cancer prevention goals and reducing health inequalities.

6. Limitation

The priority target group for HPV vaccination is girls aged 9 to 14, whereas this study focused on parents of girls aged 10 to 12. Parental views might differ for younger or older eligible girls, framing this as a potential limitation of the findings.

Conflicts of Interest

The authors declare no conflicts of interest regarding the publication of this paper.

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