



Vaccination Against Human Papillomaviruses: Knowledge, Attitudes and Practices of Pharmacists in The Dakar Region of Senegal

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Abstract

Objectives: The objectives of our study were to determine the knowledge, attitudes and practices of community pharmacists regarding human papillomavirus.

Materials and methods: This was a prospective, descriptive and analytical study conducted from 19 June to 16 August 2023, involving community pharmacists in Dakar. The selection of pharmacists and assistants was made by random sampling. The parameters studied concerned pharmacists' knowledge, attitudes and practices regarding vaccination against human papillomavirus. Data was collected through semi-structured individual interviews using a questionnaire. Data analysis was performed using the ODK (Open Data Kit) application, version 2021.3.4, and included a descriptive study and an analytical study.

Results: In our study, which included 105 pharmacies, the average age was 36.6 years, ranging from 24 to 70 years, with a predominance of males (65.7%) and a male-to-female ratio of 1.92. Forty-one point three per cent had been practising for between one and four years. Pharmacists were aware of human papillomavirus in 95.7% of cases and mentioned it as the cause of cervical cancer in 97% of cases. In our study, 90% of pharmacists were aware of the existence of vaccines against cervical cancer and 83% specified the route of administration of the vaccine. In our study, 25% of pharmacists were against HPV vaccination, with lack of information being the main reason (56.7%). The side effects of HPV vaccination were known in 78% of cases. In our series, only 15.2% of pharmacists were willing to raise awareness about HPV vaccination and participate in the fight against cervical cancer.

Conclusion: Vaccination against human papillomavirus is the first line of defence against cervical cancer. As pharmacists are the most accessible healthcare professionals for the general public, it is essential that they have a good level of knowledge about papillomavirus and vaccination against this infection in order to ensure greater awareness.



Introduction

According to the World Health Organisation (WHO), cervical cancer is the fourth most common cancer among women. In 2022, it was estimated that this cancer affects 661,021 women per year worldwide, including 27,806 women in West Africa. Its incidence and mortality are on the rise in low- and middle-income countries, which account for 90% of new cases and deaths worldwide [1].

CC is considered the leading cancer among women in Senegal and the deadliest cancer among young women between the ages of 15 and 44. There are 1,937 cases diagnosed annually, including 1,312 deaths [2]. In 1970, German virologist HARALD ZUR HAUSEN and his team established the pathogenicity of HPV as the main factor in the development of cervical cancer [3]. In fact, 99.8% of cervical cancer pathology specimens contain at least one type of high-risk oncogenic HPV. Cervical cancer is a virus-induced cancer, which means it can be prevented through vaccination against papillomavirus and screening and treatment of pre-cancerous lesions of the cervix, i.e. cancer.

One of the measures to accelerate the elimination of cervical cancer in the WHO's global strategy is the vaccination of girls aged between 9 and 14 against oncogenic papillomaviruses [4].

HPV vaccination is the first line of defence in the fight against cervical cancer. The HPV vaccine was first marketed in the United States in 2006 [5]. Senegal is the first country in West Africa to have introduced HPV vaccination for girls aged 9-14 into its Expanded Programme on Immunization in 2018. Nine out of ten girls were vaccinated in 2019, but unfortunately only one-third were vaccinated in 2022 after the COVID-19 pandemic [6].

As pharmacists are the most accessible healthcare professionals, our objectives were to assess the knowledge, attitudes and practices of community pharmacists in the Dakar region (Senegal) regarding human papillomavirus vaccination.

Materials and methods

Study period, type, and population

We conducted a prospective, descriptive study from 19 June 2023 to 16 August 2023 in the Dakar region of Senegal. The Dakar region is the capital of Senegal, which is the westernmost part of Africa and faces the Atlantic Ocean.

Our study population consisted of registered or assistant doctors of pharmacy practising in pharmacies in the Dakar region.

We conducted our survey in the four departments of the Dakar region (Dakar, Rufisque, Pikine and Guédiawaye) and our study covered 140 pharmacies selected by random sampling. A total of 105 pharmacies agreed to participate.

Inclusion criteria

We included in this study licensed pharmacists or assistant pharmacists with state-approved degrees in pharmacy.

Non-inclusion criteria

We excluded other members of staff working in the pharmacy from this study.

Sampling

The methodology for calculating the sample size for a pro-

portion is based on the binomial distribution. The objective was to determine the sample size required to estimate a proportion with a given precision (tolerable error) and a specified confidence level.

We therefore followed the following steps to calculate our sample size for:

Determine the desired confidence level at 95%: This represents the probability that the confidence interval contains the true proportion;

Choose 0.09 as our precision or the tolerable error we are willing to accept in our estimate of the proportion. This tolerable error is often expressed as a deviation from the true proportion;

Use 0.5 as a conservative value for the expected proportion (p), as this represents the most conservative estimate of the proportion (maximum variance);

Use the formula to calculate the required sample size:

$$n = Z^2 * p(1-P) / E^2$$

Where:

- n is the sample size;
- Z is the z-score corresponding to the chosen confidence level: 1.96 for a confidence level of 95%;
- p is the estimate of the expected proportion: 0.5 in our case;
- E is the desired tolerable error (precision), 0.09 in our case;

Round the calculated sample size up to the nearest integer, as the sample size must be an integer to be feasible.

Using R to perform these calculations, we used the `pwr` package to facilitate the calculation of the sample size for a proportion. This package provides dedicated functions to perform these calculations quickly and easily.

This was a simple random sampling.

Data collection and analysis

Data collection was carried out through semi-structured individual interviews using a questionnaire and prior informed consent. The interviews lasted approximately 20 minutes, during which we asked set questions to each pharmacist who agreed to participate in our study. The questions focused on knowledge, attitudes and practices regarding human papillomavirus vaccination.

The questionnaire served as a basis for collecting data from the study population. The parameters studied concerned socio-epidemiological factors such as age, marital status, gender, number of years in practice, knowledge about human papillomavirus, and knowledge about cervical cancer vaccination.

Data analysis was performed using the ODK (Open Data Kit) application, version 2021.3.4. This is a suite of tools for collecting data using mobile devices (running on Android) and submitting this data to an online server.

The analysis was performed using Stata software version 15 and consisted of a descriptive and analytical analysis.

The descriptive study described the data in terms of numbers, percentages, averages with standard deviations, extremes

and medians.

The analytical study consisted of a univariate analysis. The Chi-square test was used to compare percentages. The difference was statistically significant when the p-value was strictly inferior to 0.05.

Results

Distribution of pharmacists by department

The study covered 105 pharmacies. The department of Dakar accounted for more than half of the pharmacies surveyed (59%, n=62) (Table 1).

Socio-demographics characteristics

– Gender

Males accounted for 65.7% (n=69). The gender ratio (M/F) was 1.92.

– Age

The average age of pharmacists was 33.6 ± 9.5 years, with extremes of 24 and 70 years. The median age was 30 years. The 20-29 age group was the most represented at 42.9% (n=45), as shown in Figure 1.

– Marital status

In our study, slightly more than half of the pharmacists (51.4% (n=54)) were single, while 48.6% (n=51) were married.

– Responsibility

In our series, eight out of ten of the pharmacists surveyed (81.9% (n=86)) were assistants.

– Professional seniority

The majority of pharmacists had between 1 and 4 years of seniority (41.3% (n=43)).

Knowledge of human papillomaviruses and the HPV vaccine

Knowledge of human papillomaviruses

Almost all pharmacists (95.2% (n=100)) were aware of papillomaviruses. The information was obtained from studies (99% (n=99)), as shown in Figure 2.

In our study of 100 pharmacists who were aware of human papillomaviruses, 96% (n=96) knew that the virus could be transmitted sexually.

In our series, only 46% of pharmacists knew the main symptom of papillomavirus infection, which is a skin lesion called condyloma.

Almost all pharmacists (99%, n=99) knew that papillomaviruses were responsible for several cancers. Cervical cancer (97%, n=96) was the main cancer cited by pharmacists (Figure 3).

Among the 100 pharmacists who had already heard of human papillomaviruses, only 18% (n=18) were aware of the human papillomavirus genotypes responsible for cervical cancer. Genotype No. 16 was the most widely known (11.1%).

Knowledge of the human papillomavirus vaccine

Among the 100 pharmacists who had already heard of papillomavirus, 90% (n=90) were aware of the existence of the vaccine against the virus. However, only 27.8% (n=25) knew the names of the vaccines. The bivalent vaccine was the main vaccine known to pharmacists (12.6%).

In our series, 83% (n=83) were aware of how the human papillomavirus vaccine is administered. Intramuscular injection was the main known method of administration of the human papillomavirus vaccine (94%).

In our study, 94% (n=78) highlighted the existence of side effects associated with the human papillomavirus vaccine. Fever (97.4%) was the main symptom cited by pharmacists.

In our series, 54% (n=54) knew that the human papillomavirus vaccine had been introduced into Senegal's expanded vaccination program.

Attitudes

Usefulness of the vaccine

Almost all pharmacists (84.0% (n=81)) agreed on the usefulness of the cervical cancer vaccine. However, 12.6% (n=10) considered the vaccine useless and 8.6% (n=9) had no opinion (Figure 4). Of the 105 pharmacies surveyed, only 11.4% (n=12) had ever had the human papillomavirus vaccine available. Figure 5 illustrates the distribution of pharmacists according to the reasons for the unavailability of the human papillomavirus vaccine in their pharmacy.

Among the 105 pharmacists in the study, only 5.7% (n=6) recommended the vaccine. Sisters (50%, n=3), family (33.3%, n=2) and daughters (16.7%, n=1) were the main targets of vaccine recommendations.

Among the 105 pharmacists in our study, 82.9% (n=87) cited eligible ages for the HPV vaccine, with 54% (n=47) giving 9-14 years.

Practices

Awareness of the human papillomavirus vaccine of the 105 pharmacists in our study, only 15.2% (n=16) raised awareness among the population about the human papillomavirus vaccine.

Favourable to vaccination against human papillomavirus Approximately three-quarters of pharmacists (71.4% (n=75)) were in favour of vaccination against human papillomavirus. Prevention of cervical cancer (92% (n=69)) and public health issues (8% (n=6)) were the main reasons for acceptance.

Vaccine hesitancy

Furthermore, in our study, 28.6% (n=30) were not in favour of vaccination, which was related to a lack of knowledge about the vaccine (43.6%), as reported in Table 2.

Of the 105 pharmacies visited, only 16.2% (n=17) sold the human papillomavirus vaccine. The vaccine was sold frequently in only 11.8% (n=2) of pharmacies. The reasons for selling the vaccine were due to a medical prescription. (Table 3).

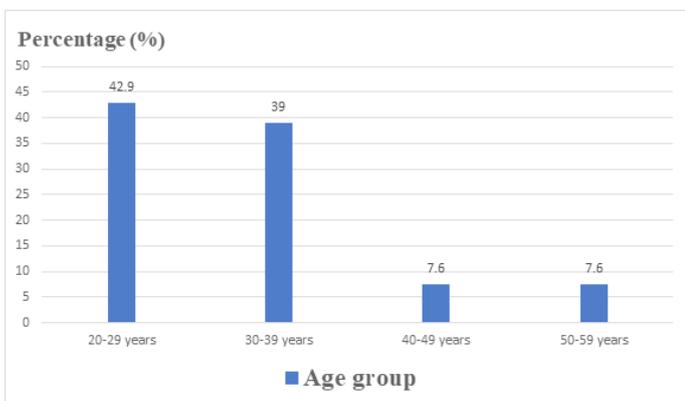


Figure 1: Distribution of pharmacists by age groups (N=105).

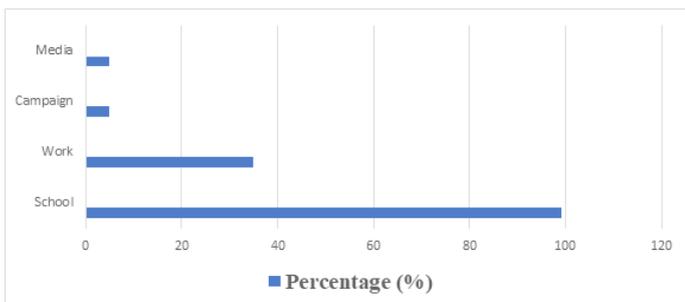


Figure 2: Distribution of pharmacists according to sources of information on human papillomaviruses (N=105).

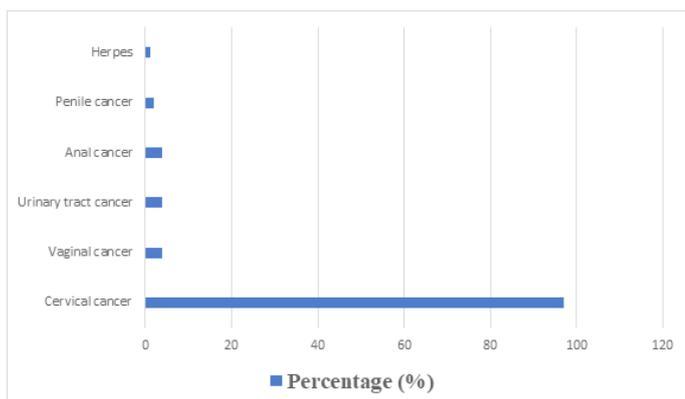


Figure 3: Distribution of pharmacists according to sources of information on human papillomaviruses (N=105).

Table 2: Distribution of pharmacists according to the reasons for reluctance toward vaccination against human papillomaviruses.

The reasons for reluctance toward vaccination against human papillomaviruses	Effective (n)	Percentage (%)
No reliable studies	19	46,3
No knowledge about the vaccine	18	43,9
Doubts about its effectiveness	2	4,9
Controversial	1	2,4
Side effects to demonstrate	1	2,4
Total	41	100,0

Discussion

Limitations and strengths of our study

- Several limitations were noted in our study. The lack of time among our study population

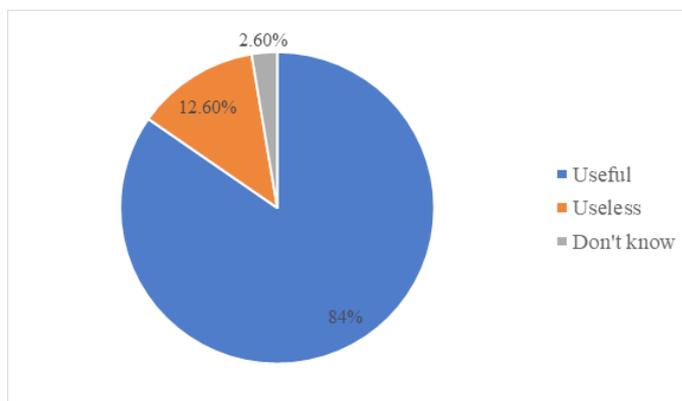


Figure 4: Distribution of pharmacists according to their perception of the usefulness of the vaccine (N=105).

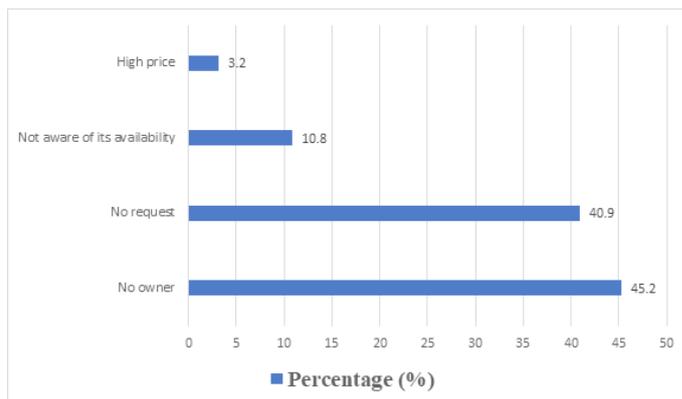


Figure 5: Distribution of pharmacists according to the reasons for the unavailability of the human papillomavirus (HPV) vaccine in pharmacies (N=93).

Table 1: Distribution of pharmacists by department (N=105).

Department	Effective (n)	Percentage (%)
Dakar	62	59,0
Pikine	26	24,8
Rufisque	10	9,5
Guediawaye	7	6,7
Total	105	100

Table 3: Distribution of pharmacists according to the frequency of marketing of human papillomavirus vaccines.

Frequency of marketing of human papillomavirus vaccines	Effective (n)	Percentage (%)
Rarely	11	64,7
Sometimes	4	23,5
Frequently	2	11,8
Total	17	100,0

- Refusal to participate in our study for personal reasons

Nevertheless, our data collection was conducted with integrity, ethics and a commitment to objectivity, thus ensuring its scientific value.

Socio-demographics characteristics

The average age of pharmacists in our study was 33.6 years, plus or minus 9.5, with extremes of 24 and 70 years; 42.9%

were aged between 20 and 29. Our results were higher than those of CISSÉ [7] and GONDJOUT [8], which were 30.9 years (21-57 years) and 30.7 years (26-50 years), respectively.

This can be explained by the population of our study, which included licensed pharmacists who may be older.

Knowledge of human papillomaviruses and the cervical cancer vaccine

Knowledge of human papillomaviruses

95.7% of the pharmacists in our study were aware of HPV, with 99% having acquired this knowledge during their medical studies.

The CISSÉ study [7] reported the same sources of information with a different rate (51.1%). Healthcare personnel were aware of HPV at a rate of 92.6%, with 51.1% having learned about it during their medical studies.

However, in our study, only 18% of pharmacists were aware of the genotypes responsible for cervical cancer, compared to 47.4% in the CISSÉ study [7]. These differences can be explained by the heterogeneity of the CISSÉ [7] study population (doctors, midwives, nurses and paramedics). We can mention a change in awareness of HPV that may have influenced the knowledge of healthcare professionals between 2019 (year of the CISSÉ study) and 2023 (the year of our study). We can cite the multiple campaigns carried out during Pink October, which often involved pharmacists.

In his 2021 study in Dakar, GONDJOUT [8] obtained better results. In fact, 96.1% of his study population were aware of HPV through medical studies and 26.3% through the media. We note that GONDJOUT's study [8] only concerned DES in obstetrics and gynaecology, who had a teaching unit on sexually transmitted diseases during their training: a significant criterion justifying these results.

Knowledge of human papillomavirus vaccines

In our study, 90% of pharmacists were aware of the existence of the HPV vaccine. Side effects were known to 78%, with 97.4% mentioning fever. More than half knew that the HPV vaccine had been part of the EPI since 2018 and that the age for vaccination was 9-14 years (54%).

The study population of TEBEU [9] in the MIFI district of Cameroon included 4 gynaecologists-obstetricians, 25 general practitioners, 118 nurses, 24 midwives and 29 nursing assistants. The results of this study reported that only 35% of healthcare personnel were aware of HPV and 32% were aware of the existence of a vaccine against HPV infection. A study in Madagascar conducted by RAFAZY in the urban commune of Maroantsetra (study population including general practitioners, midwives, nurses and anaesthetists) found that 80% of doctors and 80.77% of paramedics were aware of HPV and considered it to be responsible for CCU. The existence of the vaccine was known to 75% of doctors and 65.38% of paramedics [10].

Attitudes

In our study, almost all (84.0%) pharmacists agreed on the usefulness of the HPV vaccine. 11.42% of pharmacies (12 out of 105) had already had the vaccine available.

A review of the literature on general practitioners' attitudes towards HPV vaccination in France by GOULLÉ and GRANGEOT-

KEROS shows that a lack of knowledge about the vaccine's efficacy and usefulness influences doctors' decisions on whether to recommend it [11]. Several other studies conducted in France with general practitioners have reached the same conclusion, such as those by VERGER AND SCHWAZINGER ET in 2010, FREED in 2011 [12] and MARTINEZ [13]. More recently, the Covid-19 pandemic has heightened doubts about the usefulness of vaccines. We can see this in the study by OUEDRAGO [14].

Practices

Despite the fact that the majority of pharmacists are in favour of HPV vaccination, lack of knowledge about the vaccine remains the primary reason for reluctance, at 56.7%. This conclusion is reflected in a 2014 study conducted by the Federal Office of Public Health on the causes of non-vaccination against HPV in Switzerland [15]. It is also reflected in the study by NDIAYE [6]. In addition, the DJITTE study on the knowledge, attitudes and practices of primary school teachers in the Mecke health district regarding the vaccination of young girls against papillomavirus showed a correlation between the importance of awareness and vaccination [16]. In this study, almost 100% of teachers were aware of HPV, its impact on cervical cancer, and the age of vaccination; three-quarters were in favour of vaccination, and all had obtained this information during an awareness campaign conducted by health workers.

This observation calls for the development and implementation of training programmes for pharmacists on HPV and HPV vaccination. Furthermore, pharmacists are the first point of contact in the event of health problems.

After lack of knowledge, the perceived uselessness of vaccination for sexually inactive girls came in at 36.7%. Indeed, in a country like Senegal, where sexuality is taboo, the HPV vaccine has a 'sexual connotation', and HPV infection remains defined as an STI. Many moral and religious codes can condition behaviour and create preconceptions. Many moral and religious codes can condition behaviour and create preconceptions. We can refer to a fear of the impact of vaccination on early sexual behaviour given the presumed age of vaccination. In articles by DELA CRUZ [17], KARAFILLAKIS [18] and RENNE [19], the link between early vaccination and sexuality was cited as a barrier to vaccination. However, the article by HANSEN et al [20] on parents' views on vaccination was contradictory, with parents believing that 'the earlier the better, it's prevention'.

Despite the publication of several scientific articles attesting to the efficacy and reliable results of vaccination, mainly that published by the WHO, describing it as a well-tolerated vaccination leading to a reduction in pre-cancerous lesions. Or the 2019 INCA survey, which showed that 70% of general practitioners believed the vaccine to be safe and effective [21]. Regarding the perception of HPV vaccination in Senegal, almost all pharmacists (98.1%) believed that Senegal lacks perspective on the issue due to low awareness, a lack of studies on the subject and the unavailability of the vaccine. To improve this situation, the majority recommended increasing awareness through the media, training pharmacists, and organising conferences focused on knowledge of HPV and HPV vaccination. However, we note a clear evolution in awareness of CCU with 'Pink October', which now covers not only breast cancer but also several gynaecological cancers, including CCU.

Conclusion

Pharmacists have a key role to play in providing informa-

tion and prevention. They must provide clear information and concrete arguments based on current scientific data so that everyone can then make a free and informed decision about vaccination. Consequently, their knowledge of human papillomaviruses, vaccination against human papillomaviruses, and attitudes and practices regarding this vaccination still needs to be improved.

Author declarations

Acknowledgements

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Conflict of interest

Declare if any economic interest or any conflict of interest exists.

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