

# Knowledge And Attitudes Of Nurses Graduated In Different Decades Regarding Human Papillomavirus (Hpv) And Hpv Vaccines: A Study In Alagoas

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**ABSTRACT:** *Objective: To assess the knowledge of nurses in Alagoas regarding Human Papillomavirus (HPV) and HPV vaccines, among nurses graduated from 1990 to 2022. Method: A descriptive, exploratory, and quantitative study was conducted. The sample, a non-probabilistic convenience sample, comprised 376 nurses registered with the Regional Nursing Council of the state of Alagoas, recruited using the snowball technique. Sociodemographic information, participants' knowledge and attitudes related to HPV infection, HPV vaccines, and vaccine acceptability were collected online. Pearson's chi-square and Fisher's Exact tests were adopted as statistical tests. The variable "year of graduation" was treated as categorical and associated with the variables of interest. The Statistical Package for the Social Sciences version 20 was used for inferential estimates, with a significance level set at  $p < 0.05$ . Results: For twelve out of the twenty-three questions related to knowledge about HPV, 90% or more of the nurses, regardless of the year of graduation, provided appropriate answers. In only five questions did the majority of professionals demonstrate inadequate knowledge. Notably, inadequate results were observed for the following statements: "most of the time, HPV infection heals spontaneously" (63.9%-78.6%) and "cytopathological examination (Pap smear) is a form of primary prevention for cervical cancer" (88.7%-97.7%). Regarding attitudes towards the vaccine, out of 12 questions, 75% or more of the nurses provided appropriate answers in 11. Conclusion: The results suggest that nurses participating in the study have adequate knowledge regarding the transmission, prevention, and treatment of HPV infection. Despite the majority of nurses demonstrating adequate knowledge about HPV and appropriate attitudes towards vaccines, some gaps were identified. Therefore, there is a recognized need for interventions and educational actions for the ongoing and continuous training of nurses.*

**KEYWORDS:** *Papillomaviridae; Sexually Transmitted Infections; Cervical Cancer; HPV Vaccine; Health.*

Date of Submission: 12-12-2023

Date of Acceptance: 22-12-2023

## I. INTRODUCTION

Human Papillomavirus (HPV) is a widely disseminated virus, with some of its subtypes being oncogenic, such as HPV types 16 and 18, which contribute to approximately 70% of cervical cancers and are also correlated with cancers of the vagina, vulva, penis, anus, and oropharynx. Subtypes 6 and 11 of the HPV virus cause about 90% of genital warts (CIFU; DAVIS, 2014; BRASIL, 2015; INCA, 2023).

In the year 2015, 5,727 deaths due to Cervical Cancer (CCU) were recorded (DATASUS, 2017). From 2017 to 2021, in the state of Alagoas, 2,794 cases were reported, with the year 2020 showing the highest prevalence, totaling 503 affected women (SANTOS et al., 2022).

It is relevant to mention that the quadrivalent HPV vaccine is considered safe and approved in 133 countries, including Brazil. By the end of 2018, 85 countries, including Germany and the United States, had introduced the HPV vaccine into public vaccination programs (SANTOS; DIAS, 2018; SBIM, 2019).

In 2014, the National Immunization Program (PNI) in Brazil implemented the quadrivalent HPV vaccine free of charge. The inclusion of the target population in the vaccination plan occurred gradually. Immunization began with girls aged 11 to 13 in 2014, expanded to girls aged 9 to 11 in 2015, and in 2017, to girls aged 9 to 14 and boys aged 11 to 14, respectively (BRASIL, 2018).

In 2022, the recommendation for the quadrivalent vaccine was extended to men and women aged 9 to 45 with immunosuppression, those who underwent solid organ or bone marrow transplants, those with HIV/AIDS, cancer patients, as well as boys and girls aged 9 to 14 (BRASIL, 2022).

Since the vaccine's inclusion, misleading comments in the media and on social networks have adversely affected public health. The lack of explanations about the safety and efficacy of the vaccine hinders its adoption (LESSA; SCHRAMM, 2015). Conversely, the vaccine that protects against HPV is hampered by taboos related to sexuality, such as the prohibition of sexual activity for girls and concerns that vaccinated individuals may adopt risky sexual behaviors (OLIVEIRA; GELATTI, 2014).

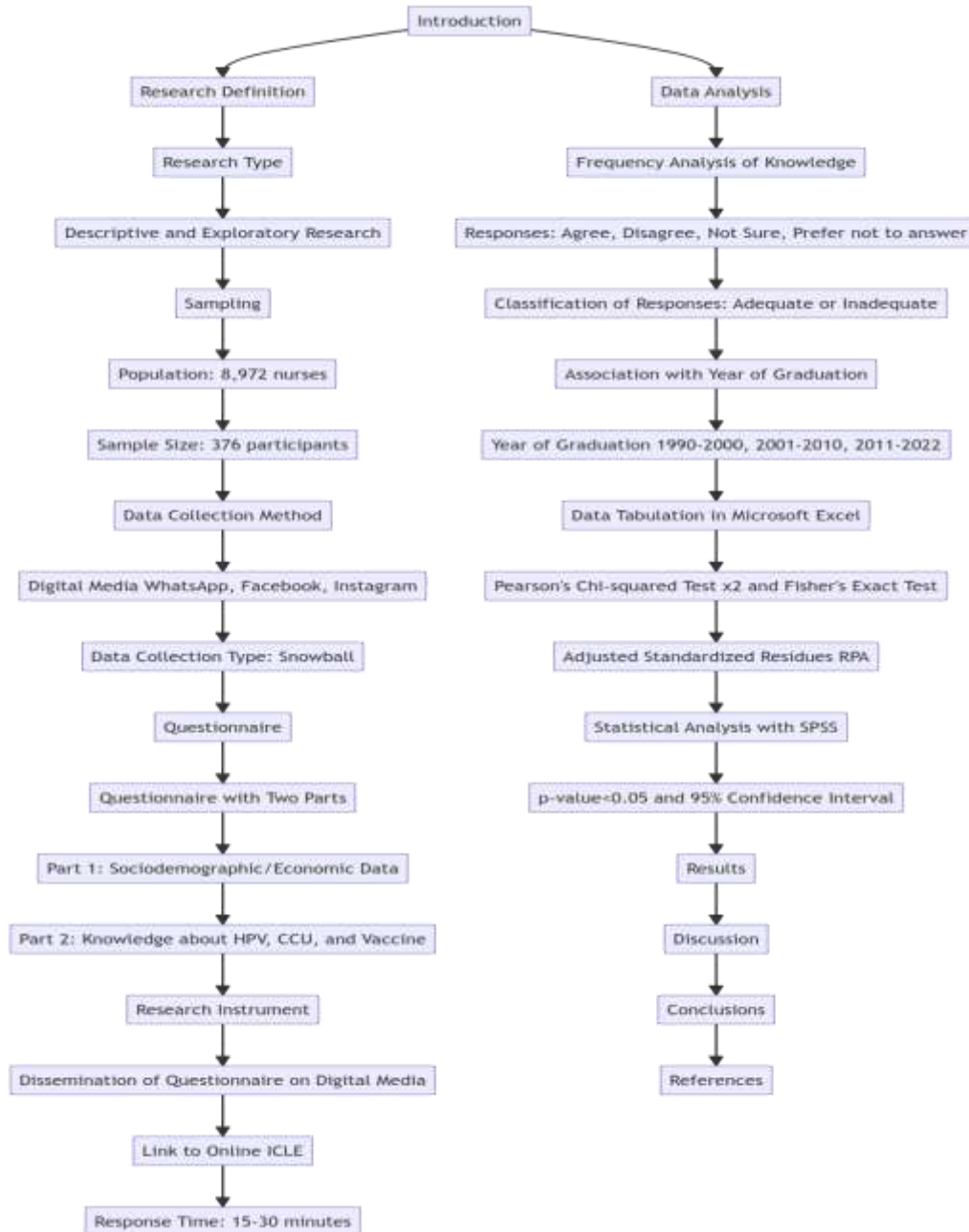
It is of utmost importance to educate women about HPV, associated risk behaviors, warning symptoms, and the appropriate frequency of contraceptive use, aiming at the prevention of CCU (BRASIL, 2004). The nurse plays a fundamental role in promoting women's health, especially concerning CCU prevention, through the dissemination of information and the implementation of preventive measures (LEITE et al., 2020). However, for this approach to be effective, it is crucial to train healthcare professionals involved in this area (BRASIL, 2004).

Given the above, the research aims to evaluate the knowledge and attitudes of nurses in Alagoas regarding HPV and HPV vaccines, considering nurses graduated from 1990 to 2022.

## **II. METHODOLOGY**

The factorial experimental design was adopted in this research, characterized by following specific methodological stages. This study, of a quantitative nature, falls within the categories of descriptive and exploratory research. Descriptive research aims to accurately portray the characteristics of individuals, situations, or groups and to identify the frequency with which certain phenomena occur (POLIT, BACK, and HUNGLER, 2004). The exploratory approach, in turn, aims to deepen the understanding of nurses' knowledge and attitudes regarding the Human Papillomavirus (HPV), as illustrated in Figure 1 (De Oliveira et al., 2018).

**Flowchart.** Methodological stages of the research.



Source: Own research, 2022.

The data presented in this research is part of the master's study titled "Knowledge and Attitudes of Nurses regarding Human Papillomavirus (HPV) Infection, Cervical Cancer, and the HPV Vaccine." This study was developed within the scope of the Professional Master's Program in Teaching in Health and Technology at the State University of Health Sciences of Alagoas and received approval from the Research Ethics Committee under approval number 5.515.521.

In the year 2022, during the research planning phase, there were a total of 8,972 registered nurses in the Regional Nursing Council of the State of Alagoas (COREN/AL). According to the sample calculation, a requirement of 370 participants was determined for the sample to be representative of the population, adopting a margin of error of 5% and a confidence level of 95%. Sampling was conducted through recruitment on digital media platforms (WhatsApp, Facebook, and Instagram), using the snowball sampling method. The final sample size was 376 participants.

The inclusion criteria for the study were as follows: nurses registered with COREN/AL, with an email address and an active account on Facebook® and/or Instagram® and/or WhatsApp®. All received questionnaires were considered for virtual entry into the database.

Data collection was conducted through a questionnaire previously used by Souza (2015), which was validated, self-administered, and composed of two distinct parts. The first part addressed questions related to sociodemographic and economic data, including age, gender, marital status, race/ethnicity (as defined by the Brazilian Institute of Geography and Statistics-IBGE), city of residence, highest degree, main nursing activity, and workplace. Some adaptations were made regarding sociodemographic characterization and information collection about the year of graduation in Nursing.

The second part of the questionnaire consisted of questions related to knowledge about HPV infection, cervical cancer, and the HPV vaccine. Additionally, questions about the acceptability of the HPV vaccine and the barriers, obstacles, and facilitators for vaccine acceptance were included.

The research instrument was distributed through digital media platforms (Facebook® and/or Instagram® and/or WhatsApp®), along with a link to access the Informed Consent Form (ICF), which was available online for download. The estimated average time for completing the questionnaire was 15 to 30 minutes.

In this article, we present the analysis related to the frequency of nurses' knowledge about specific issues related to HPV and its vaccine. Response options for the questions included "agree," "disagree," "not sure," and "prefer not to answer," all of which were mandatory. Subsequently, these responses were classified as "adequate" or "inadequate." An analysis was conducted to verify the association of this knowledge with the graduation period, which was divided into three categories: nurses graduated between 1990 and 2000, from 2001 to 2010, and from 2011 to 2022. The data were tabulated in a Microsoft Excel spreadsheet.

The association between categorical variables, such as the year of graduation, and other variables of interest was performed using Pearson's Chi-square test ( $\chi^2$ ). When necessary, the Fisher's Exact test was adopted, considering the presence of categories with expected values  $<5$  in 20% of the variables. To identify significant differences between groups in each association, Adjusted Standardized Residuals (ASR) were evaluated, with values above  $\pm 1.96$  considered statistically significant (FIELD, 2009). The program used for inferential analyses was the Statistical Package for the Social Sciences (SPSS) version 20. A value of  $p < 0.05$  and a 95% Confidence Interval (CI) were adopted for the analysis model.

### III. RESULTS

The majority of nurses were in the age range of 31 to 45 years ( $n=194$ ; 51.6%), identified as female ( $n=323$ ; 85.9%), of mixed race/ethnicity ( $n=200$ ; 53.2%), and 46% ( $n=173$ ) were married. Regarding graduation years, 44 participants (11.7%) graduated between 1990 and 2000; 97 (25.8%) graduated between 2001 and 2010, and 235 (62.5%) graduated between 2011 and 2022.

Concerning academic qualifications, the majority of nurses held a postgraduate degree (*lato sensu*) ( $n=232$ ; 61.9%). These professionals predominantly worked in the public healthcare system ( $n=245$ ; 65.2%). The majority of nurses did not have dependents under 18 years of age ( $n=199$ ; 52.9%).

The frequency of adequate and inadequate responses for each question can be observed in Table 1. The main results are highlighted below.

When asked, 'In general, does someone with HPV infection present symptoms?' 109 (47.4%) of nurses graduated between 2011-2022 appropriately disagreed with the statement, while 121 (52.6%) inappropriately agreed. Among professionals graduated between 2001-2010, 53 (59.6%) appropriately disagreed. When compared, a statistically significant difference ( $p < 0.05$ ) was observed among the graduation year categories.

Responses to the question 'Is HPV transmitted through sexual contact' showed significant differences between groups. Most responses were appropriate, agreeing with the statement; however, the highest percentage of inappropriate responses was identified among professionals graduated between 1990-2000 ( $n=2$ ; 4.7%). The percentage of appropriate responses to the question 'Is HPV transmitted through respiratory routes' among nurses remained high, particularly among those graduated from 2011-2022 ( $n=212$ ; 94.2%). Those graduated between 2001-2010 had the highest rate of inappropriate responses to the same statement ( $n=9$ ; 10.8%).

In Table 1, it was found that 22.5% ( $n=9$ ) of nurses graduated between 1990-2000 inappropriately agreed with the statement 'Men cannot contract HPV,' while only 7.7% ( $n=7$ ) and 10% ( $n=23$ ) of those graduated between 2001-2010 and 2011-2020, respectively, inappropriately agreed with the statement.

The question 'HPV infection has no treatment' had fewer appropriate responses, with only 18.6% ( $n=8$ ) of nurses graduated between 1990-2000 agreeing with the statement. An even lower percentage of appropriate responses (5.2%;  $n=5$ ) was observed among nurses graduated between 2001-2010.

The question 'Most of the time, HPV infection heals spontaneously' showed a high proportion of inappropriate responses. Professionals graduated between 2001 and 2010 had the highest rate, with 78.6% ( $n=66$ ) providing inappropriate responses. In the item 'HPV can be prevented with the cytological examination

(Pap smear), 77.5% (n=31) of professionals graduated between 1990 and 2000 inappropriately agreed with the question, while the lowest percentage of inappropriate responses (agreement) was among professionals graduated between 2001 and 2010 (n=58; 61.7%).

**Table 1. Statements from the questionnaire, frequencies (N and %) for response options, and significance value of the Fisher's Exact test for the association concerning the graduation year, regarding HPV knowledge.**

Variables and appropriate response (C-D)		Year of nursing graduation			
			1990 a 2000	2001 a 2010	2011 a 2022
HPV is a very common virus (C)	C	N	41	90	212
		%	93,2	95,7	91,0
	D	N	3	4	21
		%	6,8	4,3	9,0
HPV causes cervical cancer (C)	C	N	43	96	230
		%	97,7	100,0	98,3
	D	N	1	0	4
		%	2,3	0,0	1,7
HPV causes genital warts (C)	C	N	41	95	224
		%	93,2	97,9	96,6
	D	N	3	2	8
		%	6,8	2,1	3,4
Generally speaking, someone with an HPV infection will have symptoms (D)	C	N	23	36*	121
		%	54,8	40,4	52,6
	D	N	19	53	109
		%	45,2	59,6	47,4
HPV is transmitted through sexual contact (C)	C	N	41*	94	233*
		%	95,3	96,9	99,1
	D	N	2	3	2
		%	4,7	3,1	0,9
HPV is transmitted via the respiratory route (D)	C	N	3	9	13
		%	7,7	10,8	5,8
	D	N	36	74*	212*
		%	92,3	89,2	94,2
HPV can be transmitted through utensils/clothing (D)	C	N	17	29	62
		%	44,7	35,8	29,8
	D	N	21	52	146
		%	55,3	64,2	70,2
Using condoms completely protects against HPV (D)	C	N	23	43	104
		%	54,8	46,7	46,4
	D	N	19	49	120
		%	45,2	53,3	53,6
Men cannot contract HPV (D)	C	N	9*	7	23
		%	22,5	7,7	10,0
	D	N	31*	84	206
		%	77,5	92,3	90,0
HPV infection has no treatment (C)	C	N	8*	5	22
		%	18,6	5,2	9,4
	D	N	35*	92	213
		%	81,4	94,8	90,6
Most of the time, HPV infection heals spontaneously (C)	C	N	9	18*	79*
		%	22,5	21,4	36,1
	D	N	31	66	140
		%	77,5	78,6	63,9
HPV can be prevented with cytopathological examination (Pap smear) (D)	C	N	31	58	162
		%	77,5	61,7	69,5
	D	N	9	36	71
		%	22,5	38,3	30,5
There is already a vaccine against HPV (C)	C	N	44	93	230

		%	100,0	98,9	98,7
	D	N	0	1	3
		%	0,0	1,1	1,3
Cervical cancer is the second most common cancer among women in Brazil. (W)	C	N	42	88	203
		%	100,0	98,9	92,3
	D	N	0	1	17
		%	0,0	1,1	7,7
HPV infection increases the risk of cervical cancer. (W)	C	N	42	96	229
		%	95,5	99,0	98,3
	D	N	2	1	4
		%	4,5	1,0	1,7
Genital warts are symptoms of cervical cancer. (D)	C	N	15	40	83
		%	35,7	43,0	37,2
	D	N	27	53	140
		%	64,3	57,0	62,8
Cytopathological examination (preventive) is a form of primary prevention of cervical cancer. (D)	C	N	43	86	212
		%	97,7	88,7	91,4
	D	N	1	11	20
		%	2,3	11,3	8,6
Cervical cancer cannot be prevented with the vaccine (D)	C	N	19*	25	56
		%	46,3	28,1	24,8
	D	N	22*	64	170
		%	53,7	71,9	75,2
Initially, the cytopathological examination should be carried out annually, even in women without cervical lesions. (W)	C	N	41	88	201
		%	93,2	94,6	87,0
	D	N	3	5	30
		%	6,8	5,4	13,0
The cytopathological examination has high sensitivity for detecting precussion lesions of cervical cancer. (W)	C	N	39	92	211
		%	92,9	95,8	93,8
	D	N	3	4	14
		%	7,1	4,2	6,2
Women with two consecutive normal cytopathological tests can take the test every three years. (W)	C	N	28	58	165
		%	70,0	74,4	77,5
	D	N	12	20	48
		%	30,0	25,6	22,5
HPV does not cause cancer in men. (D)	C	N	4	12	24
		%	10,3	14,6	11,4
	D	N	35	70	187
		%	89,7	85,4	88,6
HPV can cause cancer in places other than the genital tract. (W)	C	N	26	58	156
		%	78,8	84,1	82,1
	D	N	7	11	34
		%	21,2	15,9	17,9

Source: Survey data, 2022.

In the statement 'Cervical cancer cannot be prevented with the vaccine,' professionals with graduation between 1990 and 2000 presented the highest proportion of inappropriate responses with (n=19; 46.3%), while those from 2011 to 2022 demonstrated the lowest percentage of inappropriate responses with (n=56; 24.8%).

Table 2 presents the frequencies of responses given by nurses regarding knowledge of the HPV vaccine. The question 'Is the HPV vaccine recommended for women aged 9 to 45 years' was inappropriately answered by 45.8% (n=98) of professionals graduated between 2011 and 2022, while approximately 26.2% (n=11) of those graduated between 1990 and 2000 provided inappropriate responses.

**Table 2 - Statements from the questionnaire, frequencies (N and %) for response options, and significance value of the Fisher's Exact test for the association between year of graduation and questions about knowledge of the HPV vaccine.**

Variables and expected response (C-D)	Year of nursing graduation		
	1990 a 2000	2001 a 2010	2011 a 2022

The HPV vaccine is not yet part of the National Immunization Program (PNI). (D)	C	N	7	9	22
		%	15,9	9,5	9,5
	D	N	37	86	210
		%	84,1	90,5	90,5
The quadrivalent HPV vaccine prevents genital warts. (W)	C	N	31	59	152
		%	77,5	74,7	75,6
	D	N	9	20	49
		%	22,5	25,3	24,4
The HPV vaccine prevents cervical cancer. (W)	C	N	36	82	189
		%	83,7	85,4	83,6
	D	N	7	14	37
		%	16,3	14,6	16,4
The HPV vaccine has low efficacy. (D)	C	N	4	2	5
		%	9,3	2,1	2,2
	D	N	39	92	222
		%	90,7	97,9	97,8
The HPV vaccine is only recommended for women. (D)	C	N	6	8	19
		%	14,6	8,6	8,3
	D	N	35	85	209
		%	85,4	91,4	91,7
The HPV vaccine is recommended for women aged 9 to 45. (W)	C	N	31*	56	116*
		%	73,8	65,9	54,2
	D	N	11	29	98*
		%	26,2	34,1	45,8
Women vaccinated against HPV do not need to take a preventive exam. (D)	C	N	2	1	6
		%	4,8	1,0	2,6
	D	N	40	96	226
		%	95,2	99,0	97,4
Women who have already started their sexual life can take the HPV vaccine. (W)	C	N	34	79	170
		%	85,0	84,9	77,3
	D	N	6	14	50
		%	15,0	15,1	22,7
Women with cytological changes in the preventive exam should not take the HPV vaccine. (D)	C	N	11	17	43
		%	27,5	23,0	22,9
	D	N	29	57	145
		%	72,5	77,0	77,1
Common reactions to HPV vaccines are mild, such as pain and discomfort at the site of application. (W)	C	N	36	83	209
		%	90,0	94,3	95,0
	D	N	4	5	11
		%	10,0	5,7	5,0
Taking the HPV vaccine can encourage girls to start having sex early. (D)	C	N	2	3	9
		%	4,7	3,1	3,9
	D	N	41	93	223
		%	95,3	96,9	96,1
The HPV vaccine causes serious adverse reactions. (D)	C	N	3	2	6
		%	7,1	2,3	2,7
	D	N	39	85	217
		%	92,9	97,7	97,3

**Source:** Survey data, 2022.

**Use:** Test Fisher's exact, D=Disagree; C=Agree; \* Statistically significant group based on analysis of adjusted standardized residuals >1.96 (p<0.05).

Table 3 displays the nurses' responses to inquiries about their attitudes towards the HPV vaccine. Among the responses, it is noteworthy that 99.5% (n=374) of professionals answered 'YES' to the statement: 'Would you give the HPV vaccine to your daughter(s)'. Additionally, 99.2% (n=373) believe in vaccines as a form of prevention. Only 55.3% (n=208) of professionals stated that they would administer the vaccine to their child(ren) because the family doctor recommended it, and 7.7% (n=29) of professionals would not give the vaccine to their children because the family doctor did not recommend it. A low percentage (n=19; 5.1%) of participants were against the HPV vaccine and asserted that their child(ren) do not need the vaccine. Almost all nurses (n=372; 98.9%) would recommend the HPV vaccine. Lastly, only 58.2% (n=219) of nursing

professionals believe that a healthcare professional's recommendation is sufficient to convince someone to use the HPV vaccine.

**Table 3 - Statements about nurses' attitudes towards the HPV vaccine.**

Variables and responses	N	%
Would you give your daughter the HPV vaccine? Answer even if you don't have a daughter.	374	99,5%
Because I believe in vaccines as a form of prevention.	373	99,2%
Because the HPV vaccine is part of the National Immunization Program	360	95,7%
Because the vaccine prevents cervical cancer.	343	91,2%
The vaccine prevents genital warts.	302	80,3%
The family doctor recommended the HPV vaccine.	208	55,3%
The HPV vaccine is very effective.	350	93,1%
The HPV vaccine is safe.	366	97,3%
The vaccine is free.	345	91,8%
Because I'm against vaccines.	19	5,1%
My daughter does not need to get the HPV vaccine.	19	5,1%
Because I'm afraid of adverse events/reactions to the HPV vaccine	26	6,9%
My daughter is too young to get the HPV vaccine.	30	8,0%
The family doctor did not recommend this vaccine.	29	7,7%
My religion does not allow vaccination against HPV.	14	3,7%
The vaccine can stimulate the initiation of sexual life in adolescents.	27	7,2%
Would you recommend the HPV vaccine.	372	98,9%
In your opinion, is a health professional's recommendation enough to convince someone to use the HPV vaccine?	219	58,2%

**Source:** Survey data, 2022.

#### IV. DISCUSSION

From the results obtained, it is noticeable that the majority of questions related to the symptomatology of HPV infection, virus transmission, prevention, and vaccine recommendation demonstrated adequate knowledge on the part of nurses. This alignment corresponds to the guidelines proposed by specialized literature and relevant technical bodies such as the World Health Organization, the Ministry of Health, the National Cancer Institute, and the Oswaldo Cruz Foundation.

Furthermore, the attitudes of nurses related to vaccination, as assessed by the research instrument used, can be considered appropriate. They demonstrate a high interest in recommending the HPV vaccine and administering it to their children. These results are encouraging, indicating that these professionals follow the recommendations and guidelines proposed by health organizations.

However, for some topics, there seems to be a need for updating or additional training to guide nurses toward appropriate conduct for knowledge currently deemed inadequate, particularly regarding the treatment of HPV infections and guidance related to the age group for vaccine use.

The research indicates that half of the participants (52%) who received their professional training in the last decade reported not knowing that 'In general, HPV infection does not present symptoms.' This result is similar to another study conducted with nurses in the State of Bahia, where half of the nurses with less than five years of professional training and 40% of nurses with over five years of training did not know that infections caused by HPV are usually asymptomatic (SOUZA, 2015). The results highlight the importance of ongoing health education related to the characteristics of HPV infection.

In another study conducted in Thailand, 33.1% of nurses incorrectly responded that HPV infection is associated with warts, and only 29.3% reported knowing that HPV infection is not always linked to genital warts (NGANWAI, et al. 2008). The data demonstrate that many professionals incorrectly associate HPV infection with genital warts, overlooking the possibility of asymptomatic infection.

According to the Ministry of Health (2022), HPV infection does not present symptoms in most people. In some cases, HPV can remain hidden for months or years without visible symptoms or with subclinical



symptoms (not visible to the naked eye). This result is similar to a study in Turkey where nurses and nursing students were not aware that a large portion of HPV infections are asymptomatic (TOPAN et al., 2015).

Regarding the understanding that 'Men cannot contract the HPV virus,' it was found that 22.5% of nurses with longer professional training (around thirty years) and 10% of those graduated in the last decade responded inappropriately to the statement, agreeing with it. In general, it is notable that men associate the damages caused by HPV, such as cervical cancer (CCU), with signs and symptoms almost absent in the male population and believe that the virus easily spreads in women (COSTA; GOLDENBERG, 2013).

However, it is important to emphasize that HPV infection can affect men and women differently. The inclusion of women in HPV vaccination programs may lead men to assume that they are not vulnerable to infection. But, just like in women, HPV can cause cancer in other non-genital organs in men (SOUZA, 2015). Among nurses with longer professional training, the statement related to HPV infection in men showed a lower percentage of inappropriate responses.

The study by Souza (2015) found that nurses confuse the treatment of pre-invasive lesions of cervical cancer with HPV infection. A significant number of professionals are not aware that HPV infection does not have appropriate therapy (SOUZA, 2015). This conclusion was reflected in this research, where almost all nurses with two decades of training responded inappropriately to the statement 'HPV infection has no treatment.' It is relevant to highlight that there is no specific therapy for the infection itself, but rather ways to treat precursor lesions of cervical cancer, providing essential guidance to direct the population to available treatment options.

When asked if 'Most of the time, HPV infection cures spontaneously,' 78.6% of nurses who received their professional training over two decades responded inappropriately to the statement. It is possible to observe that, faced with this statement, half of the nurses with a longer professional training period believe that the HPV virus does not spontaneously cure in the majority of cases.

The Ministry of Health (2022) reinforces that HPV infection is very common but transient, usually resolving spontaneously. In rare cases, if the infection persists and is primarily caused by an oncogenic type of virus (which can cause cancer), lesions may develop and evolve into cancer if not detected and treated, especially in the cervix, vagina, vulva area, anus, penis, oropharynx, and mouth.

Regrettably, misconceptions about HPV infection lead to questions related to prevention strategies, transmission, and treatment. Consequently, the implementation of health education initiatives becomes essential, along with the development of direct and accurate awareness campaigns (PANOBIANCO et al., 2013).

The lack of knowledge about HPV has been found to be prevalent in other studies, where few indicated adequate knowledge about the virus (OSIS; DUARTE; SOUSA, 2014). However, several other studies have shown that knowledge about HPV infection is high in countries with national HPV education programs. These programs have increased awareness among healthcare professionals and the public about HPV infection and related diseases. In a study conducted in Nigeria, only a quarter of nurses claimed to have knowledge about vaccination and understood that it is intended for cervical cancer prevention (MAKWE; ANORLU, 2011).

This scenario emphasizes the need for educational activities among the population to increase awareness of transmission and promote alerts about prevention methods, encouraging strategies for adopting healthy behaviors (SOUZA; COSTA, 2015).

In this research, it was found that 77.5% of nurses with longer training, around thirty years, agree that the Pap smear can prevent HPV infection. The Pap smear is an examination that can detect lesions that are precursors to cervical cancer; it is a screening test, not a prevention method for HPV infection. It can help determine if you have any other infection that may require treatment (BRASIL, 2011).

When asked if 'Cervical cancer cannot be prevented by the HPV vaccine,' 75.2% of nurses with shorter training appropriately disagreed with the statement. Coinciding with this finding, a study conducted in Thailand found that 66.2% of nurses believed that the HPV vaccine was linked to preventing HPV infection, and 77.3% would like to take it because they thought the vaccine would prevent HPV infection (NGANWAI, et al., 2008). On the other hand, in the present study, it was observed that, for this same statement, 46% of nurses with longer graduation time, graduated between 1990 and 2000, believed that the vaccine does not protect against cervical cancer.

An inverse situation was observed in responses to the statement 'The HPV vaccine is recommended for women aged 9 to 45.' In this context, 73.8% of nurses with longer training responded appropriately, while only 45.8% of nurses with less training responded inadequately, highlighting a statistically significant difference.

This result is unexpected, considering that the recommendation for the vaccine for women aged 9 to 45 was introduced recently through an update issued by the Ministry of Health in 2022. It was expected that nurses who completed their training more recently would have current information. This fact may be due to a flaw in the training of nurses (SOUZA, 2015).

The acceptance of the vaccine by nurses was significant, with 99.5% of them willing to give the HPV vaccine to their children, even in light of gaps in knowledge about HPV and the types of cancers associated with this virus (SOUZA, 2015).

Immunization is recognized as a transformative agent in the course of diseases, as morbidity and mortality from immunopreventable infectious diseases have been drastically reduced. It constitutes the best and most effective procedure for promoting and protecting human health. With high vaccination coverage, it can influence the epidemiological behavior of immunopreventable diseases (NORA et al., 2016).

In countries like Nigeria, acceptance rates of the HPV vaccine were lower than those observed in this study, where 70% of Nigerian nurses reported accepting the HPV vaccine (MAKWE, ONORLU, 2011). It is important to note that administering the HPV vaccine does not provide health promotion attitudes. Therefore, vaccinated patients should receive guidance on how to use condoms to avoid infection with other non-vaccine HPV types and other sexually transmitted diseases (CARDIAL et al., 2019).

In this study, 99.2% of nurses believe in vaccines as a form of prevention. These results were similar to another study conducted with nurses in the state of Bahia, where 89% believed in the vaccine as protection against cervical cancer (SOUZA, 2015) and higher than a study conducted in Thailand where 39.1% of nurses believed in the HPV vaccine for cervical cancer prevention (NGANWAI et al., 2008). In another study in Nigeria, only 13% of nurses knew that cervical cancer could be prevented through vaccination.

Although nurses have demonstrated adequate knowledge on most issues addressed, the lack of knowledge on some aspects of HPV infection and vaccination can impact the quality of their services, as well as the quality of life and health of the population. This is because the provision or absence of guidance has a direct impact on people's initiative to seek primary or secondary prevention mechanisms (WASH et al., 2008).

Learning and teaching are part of the daily life of nurses (CITOULA; ILHA; STEIN, 2015). The health sector is in constant parallel with the development of scientific knowledge, driven by clinical, social research, new technologies, and epidemiological and human changes (COSTA et al., 2013). Nursing, like other fields, is characterized as a social profession that strengthens itself in the field of science, technology, and innovation. Therefore, the qualification of these professionals must be consistent and meet the competitiveness standards of the job market, meaning that nurses working in healthcare must constantly seek scientific information that supports nursing activities (OLIVEIRA et al., 2009).

Studies show evidence that continuing education improves the quality of patient care and reduces parallel implications (BOWIE; SKINNER; WET, 2013). Furthermore, continuing health education has become a prerequisite for nurse training, requiring new ways of seeing and learning information (CITOULA; ILHA; STEIN, 2015).

The implementation of permanent health education policy is directly related to health qualification according to the principles of the Unified Health System (SUS) and seeks to change work practices that continue to focus on a model that values assistance over comprehensive treatment. Therefore, it should be considered that the implementation of permanent training centers in health units is a fundamental way to ensure convincing training processes for nurses and health teams that meet learning requirements in the reality of work (SANTOS et al., 2020).

## **V. CONCLUSION**

The results reveal adequate knowledge among nurses regarding HPV and HPV vaccines. However, concerning percentages of inadequate responses were identified in some questions, such as agreeing that men cannot contract HPV and that HPV infection has no treatment. It is important to emphasize that attitudes toward vaccines were appropriate, demonstrating a willingness to recommend and administer vaccination to their own children.

Despite the observed gaps in knowledge, a large proportion of participants believe in vaccines as a form of prevention and would recommend the HPV vaccine. However, less than half of the participants believe that a health professional's recommendation is sufficient to convince someone to take the vaccine.

Therefore, the results highlight the need for educational and training interventions to enhance nurses' knowledge of HPV, vaccines, and cervical cancer. Obtaining correct and updated information on these topics, including prevention, treatment, and guidance related to the importance of vaccination, is considered essential.

Furthermore, we recognize that knowledge plays a fundamental role in all predictors of cervical cancer, serving as an alert to the population, especially women, and motivating efforts from professionals to achieve better results.

As a suggestion for future research, it is recommended to conduct studies to evaluate the effectiveness of educational and complementary training interventions on HPV, cervical cancer, and HPV vaccination. This includes measuring the knowledge acquired by nurses and changes in attitudes regarding vaccination, as well as assessing the impacts of these interventions on the clinical practice of nurses.

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