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## Adherence to HPV vaccine by responsible of boys in an elementary school Dr. Afrânio de Mello Franco

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### ABSTRACT

#### OBJECTIVE

Human Papillomavirus (HPV) is directly related to carcinoma of the cervix, oropharynx, anus, and penis. HPV infection can be prevented by vaccination and since 2017. Both boys and girls have free access to the vaccine by Public Health System. The present study aimed to carry out an epidemiological survey on HPV vaccination in boys, between 2017 and 2018 at the Dr. Afrânio de Mello Franco municipal elementary school.

#### METHODS

A transversal, descriptive and analytical study was carried out. The data were collected through the application of a questionnaire to those responsible for the children.

#### RESULTS

It was observed that the vast majority of those responsible for the boys were women (90.48%). In general, 36.84% did not adhere to the HPV vaccination campaign, although 97.37% of them considered vaccination important, regardless whether they adhered or not to the vaccination campaign. Among the main reasons for the non-adherence was the lack of knowledge that boys can get the vaccine (42.86%), the age that they could receive the vaccine (21.43%), and the lack of time (21.43%).

#### CONCLUSIONS

Our results suggest that non-adherence to vaccination in boys is mainly due to the lack of information on the vaccine, the HPV infection, correlation of the infection with cancer of the penis and cervix. Dissemination of that knowledge, mainly by television might improve adherence to the HPV vaccination.

#### DESCRIPTORS

Vaccine, Human papillomavirus, Vaccination, Children, Boys.

### RESUMO

#### OBJETIVO

O Papilomavírus Humano (HPV) está diretamente relacionado ao carcinoma do colo do útero, orofaringe, ânus e pênis. A infecção pelo HPV pode ser prevenida com a vacinação e desde 2017 ambos meninos e meninas tem acesso a vacina gratuitamente pelo SUS. O presente trabalho teve como objetivo fazer um levantamento epidemiológico sobre a vacinação contra o HPV em meninos, entre os anos de 2017 e 2018 na escola municipal Dr. Afrânio de Mello Franco.

#### MÉTODOS

Foi realizado um estudo do tipo transversal, quantitativo e descritivo. Os dados foram coletados por meio da aplicação de um questionário aos responsáveis pelas crianças.

#### RESULTADOS

Foi observado que a grande maioria dos responsáveis pelos meninos foram mulheres (90,48%). De maneira geral, 36,84% não aderiram à campanha de vacinação contra HPV, embora, 97,37% das responsáveis consideraram a vacinação importante, independentemente se aderiram ou não à campanha de vacinação. Entre os principais motivos da não adesão foi apontado a falta de conhecimento que os meninos podem tomar a vacina (42,86%), a partir de qual idade poderiam receber a vacina (21,43%) e a falta de tempo (21,43%).

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## CONCLUSÃO

Nossos resultados sugerem que a não adesão à vacinação em meninos se deve principalmente à falta de informação sobre a vacina, a infecção pelo HPV, a informação da correlação da infecção com câncer de pênis e colo do útero. A divulgação desses conhecimentos, principalmente pela televisão, pode melhorar a adesão à vacinação contra o HPV.

## DESCRITORES

Vacina, Papilomavírus humano, Adesão, Crianças, Meninos.

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## INTRODUCTION

Human papillomavirus (HPV) is currently one of the most recurrent sexually transmitted infections in the world, being associated mainly with the development of head and neck cancer as well as anogenital<sup>1</sup>. Based on the International HPV Reference Center, more than 200 different types of HPV have been identified<sup>2</sup>, a number that is constantly expanding<sup>3</sup>. Of these, about 40 types can infect the anogenital system and/or the oropharynx<sup>4</sup>. HPV types can be classified as low oncogenic risk (6, 11, 42, 43, 44, 54, 61, 72 and 81) and high oncogenic risk (16, 18, 31, 33, 35, 39, 45, 51, 52, 56, 58, and 59)<sup>4</sup>. The types of low oncogenic risk HPV in the cervix are associated with low-grade squamous intraepithelial lesions, including genital warts and flat condyloma, within the most frequently found are HPV types 6 and 11<sup>5</sup>. In contrast, those of high risk are found in high-grade squamous intraepithelial lesions and carcinomas of the cervix and oropharynx, being potentially oncogenic and frequently associated with HPVs 16 and 18<sup>4,6</sup>.

Persistent infection with certain types of HPV are risk factors for developing malignant neoplasms, including cervical cancer, the second most common type of cancer in women, a disease that registers about 530 thousand new cases per year<sup>1,7</sup>. In a 2015 survey, the Brazilian Ministry of Health pointed out that 291 million women were infected worldwide by the virus<sup>7,8</sup>. Beyond cervical cancer, HPV also is a risk factor to oral cancer, which affects the lips and the interior of the oral cavity. The Brazilian National Institute of Cancer (INCA) estimates pointed to the incidence of 11.180 new cases for each year of the 2020-2022 triennium in men and 4.010 in women. Corresponding to an average of 10,69 new cases for every 100 thousand men and 3,71 for every 100 thousand women<sup>1</sup>.

Another malignant neoplasm that has been associated with studies about HPV is penile carcinoma. HPV is increasingly being associated with penile squamous cell carcinoma, being present in 15 to 71% of cases<sup>9</sup>. HPV types 16 and 18 being the most frequently found<sup>9,10</sup>. Penile carcinoma usually affects low-income men, with poor hygiene habits, with phimosis, or infected with HPV<sup>9,11</sup>. Studies indicate that Brazil has one of the highest incidences of penile carcinoma globally, being the fourth most common type of male cancer in the North and Northeast regions of the country<sup>12-14</sup>. A relevant topic within this subject is the psychological stress of the individual affected by penile carcinoma that can cause treatment adherence loss due to fear of a possible penectomy sometimes associated with the stereotype of the loss of masculinity<sup>15</sup>. Due to the facts, among others, penile carcinoma has a low overall survival rate<sup>15</sup>.

In most cases, men infected with HPV are asymptomatic, thus not only makes them susceptible to transmitting the virus to their partners but also increases the chances of injuries, manifesting in many cases the acuminated condyloma and in some cases the penile carcinoma, as well as enabling late diagnosis of penile carcinomas, as occurs in most cases<sup>16,17</sup>. In this context, one of the main strategies on primary health care to control this spread is vaccination, since it breaks the chain of transmission of the virus, in addition to acting in the prevention of the development of HPV-related carcinomas in men, this being one of the most effective methods in preventing health problems<sup>18,19</sup>.

In the Americas, HPV vaccination was first introduced in 2006 in the United States. In Brazil, the National Immunization Program (PNI) introduced the quadrivalent HPV vaccine, which protects against infections caused by HPV types 6, 11, 16, and 18, free of charge in 2014<sup>20</sup>. In 2020, the quadrivalent vaccine is recommended for girls and women in the age group of nine to forty-five years, as well as boys and men from nine to twenty-six years of age<sup>21</sup>.

At the beginning, the priority target population for the HPV vaccination campaign in Brazil was girls aged 9 to 14 years and boys aged 11 to 14 years. They should receive two doses (0 and 6 months) with an interval of six months. Another recommended population were women infected with HIV in the age range of 9 to 26 years, who receive three doses (0, 2 and 6 months). The incorporation of the target populations in the vaccination schedule occurred gradually, starting with girls aged 11 to 13 in 2014, and being expanded in 2015 to the age group of nine to 11 years with later expansion in 2017 for girls at the age of 14<sup>22</sup>. The campaign aimed to cover 80% of the target population to reduce in the incidence of cancer associated with HPV in the coming decades in Brazil<sup>23</sup>.

However, it is important to note that vaccinating only girls is not enough to interrupt the chain of infection to increase control over cancer development the campaign was expanded by the Ministry of Health to cover relatively effectively the boy's vaccination<sup>24</sup>. In 2017, 1.6 million boys aged 12 to 13 were vaccinated with the first dose of HPV vaccine in Brazil, equivalent to 43.8%. For girls aged 9 to 14, the first dose vaccinated 8 million girls, the equivalent to 79.21%.

Clinical studies on the effectiveness of the vaccine in men have shown that the HPV vaccine has an efficacy of 65.5% in preventing the development of external genital lesions caused by HPV types 6, 11, 16, and 18. The effectiveness in preventing condyloma acuminated was 89.4%. Indicating that the vaccine's effectiveness extends to men and is not restricted to women<sup>25</sup>. The difference between adherence to vaccination in those two

populations demonstrates the less coverage on boy's vaccination, and the reasons behind this unsatisfactory data remain under debate<sup>26</sup>.

Thus, the present study aims to evaluate the adherence to the vaccination campaign by the caretakers of male children and the reasons for lack of adherence. With the data obtained in this research, we will be able to analyze what reasons led parents to vaccinate their male children or not and what can be done to increase adherence to the HPV vaccine.

## METHODS

### Study type

The Ethics and Research Committee (CEP), CAE 90812818.4.0000.0081 and the involved institution, approved the transversal, descriptive and analytical study.

### Instrument and location

The work was based on a questionnaire with 20 open and closed questions, direct to parents or responsible of male child students of the Municipal School of Elementary Education Dr. Afrânio de Mello Franco, in São Paulo/SP, during a parents meeting.

### Inclusion criteria

Parents or responsible of male child students within age from eleven - fourteen years old that agree to answer the questions.

### Exclusion criteria

Parents or responsible of female child students and who did not agree to participate of interview.

### Statistical analysis

Responses were grouped two (vaccinated or not), represented as percentage and compared by Fisher's exact test using a Graphpad Prism program (version 6.01). The level of significance was set at 5% ( $p < 0.05$ ).

## RESULTS

In the present work it will be used the name caregivers to parents or responsible that did accompany male children during parents' meeting at the Municipal School of Elementary Education Dr. Afrânio de Mello Franco, in the south of São Paulo. Forty-two caregivers of male children answered the questionnaire, of those, as shown in Table 1, 90.48% were women. For the next analyzes, only the questions answered female caregiver were considered (38 questionnaires).

Table 1 - Parents/guardian gender and the importance of the vaccine.

Variable	Vaccinated	Non-vaccinated	Total	% gender
Female	24	14	38	90.48
Male	0	4	4	9.52
Total	24	18	42	100.00

Of the female caregivers, 63.16% joined the HPV vaccination campaign (Table 1). When asked about the number of doses taken of the vaccines, 62.50% of those parents/caregivers took the boys to take the first dose and 37.50% (Table 2). As the HPV vaccination campaign for boys did not normally take place in schools, 79.17% (Table 2) of those parents/caregivers took the children to get the vaccine in the Basic Health Units (UBS).

Of the female caregivers, 36.84% did not adhere to the HPV vaccination campaign (Table 1), although, in general, 97.37% of the caregivers considered vaccination important, regardless their adherence to the vaccination campaign (Table 3). Concerning the reasons to not take their children to vaccinate, the most common reason was the lack of knowledge that boys can get the vaccine (42.86%), followed by the unknown the age that they could receive the vaccine (21.43%), lack of time (21.43%) and others (14.29%).

Table 2 - Doses taken, location and reasons for not vaccinating.

Variable	Number	%
<b>Vaccination location</b>		
Primary Health care	19	79,17
School	5	20,83
Total	24	100,00
<b>Reasons for not vaccinating</b>		
Did not know about the vaccine	6	42,86
Did not know the age	3	21,43
Lack of time	3	21,43
Others	2	14,29
Total	14	100,00

Regarding the knowledge of caregivers concerning HPV vaccine (Table 3), most of the caregivers knew about the HPV's vaccination campaign (87.50% of the vaccinated and 57.14% of the non-vaccinated children). It is possible to notice that statistical difference concerning the knowledge that HPV causes cervical cancer ( $p = 0.0063$ ), nor can that boys become infected with HPV ( $p = 0.0063$ ), along with the lack of knowledge about the relationship between penile cancer and HPV infection ( $p = 0.0049$ ).

Table 3 - Knowledge of guardians concerning HPV vaccine.

Variable	Variable	Vaccinated	Non-vaccinated	p
Knowledge about the vaccine	Yes	21 (87.50)	8 (57.14)	0.9428
	No	3 (12.5)	6 (42.86)	
Consider the vaccine important	Yes	24 (100.00)	13 (98.67)	0.3684
	No	0 (0.00)	1 (33.33)	
HPV causes cervical cancer	Yes	22 (91.67)	7 (50.00)	0.0063
	No	2 (8.33)	7 (50.00)	
Boys can get infected	Yes	22 (91.67)	7 (50.00)	0.0063
	No	2 (8.33)	7 (50.00)	
HPV* men develop cancer	Yes	19 (79.17)	4 (28.57)	0.0049
	No	5 (20.83)	10 (71.43)	
Total		24 (100.00)	14 (100.00)	

As shown in Table 4, both groups had a history of cancer in the family and the socioeconomic profile of those responsible does not seem to interfere in the lack of adherence to the vaccination campaign, the family income of the groups that vaccinated the children or not, is less than R\$ 2,000.00 (62.50% and 78.57%, respectively). No statistical difference was observed in marital status (respectively 50.00% and 42.86% are married) or in the level of education of the parents, although most of the parents (62.50%) adhered to the vaccination campaign are high school graduates or undergraduates.

Table 4 - Family history and socioeconomic status.

Variable	Variable	Vaccinated	Non-vaccinated	p
Family history	Family cancer			1.0000
	Yes	10 (41.67)	6 (42.86)	
Family income	No	14 (58.33)	8 (57.14)	0.4722
	<2.000	15 (62.50)	11 (78.57)	
Marital status	>2.000	9 (37.50)	3 (21.43)	0.5210
	Married	12 (50.00)	6 (42.86)	
Scholarity	Single	6 (25.00)	2 (14.29)	0.2802
	Separate	4 (16.67)	5 (35.71)	
Total	Divorced	2 (8.33)	1 (7.14)	
	Middle	6 (25.00)	6 (42.86)	
	High	15 (62.50)	5 (35.71)	
	Undergraduate	3 (12.50)	3 (21.43)	
Total		24 (100.00)	14 (100.00)	

When asked by which advertising ways, they were aware of HPV vaccination (Table 5), in both groups (parents who vaccinated and those who did not vaccinate) television is cited as the main vehicle of dissemination (respectively 66,67% and 78,57%).

Table 5 - advertising ways where you heard about the HPV vaccination.

Variable	School	PHC	TV	Other	Total	% TV
Advertising ways						
Vaccinated	2	2	16	4	24	66,67
Non-vaccinated	0	2	11	1	14	78,57
Total	2	4	27	5	38	71,05

PHC: Primary Health care, TV: television

## DISCUSSION

The HPV vaccine was included in the National Vaccination Calendar in 2014 also in that year the Brazilian Ministry of Health organized large vaccination campaigns and in just four months reached the vaccination coverage of 85% of girls with the first dose of the vaccine. In 2017, when the vaccine became available to boys, this vaccine coverage was 43.8% of vaccinated boys. Thus, adherence to the vaccine by boys throughout Brazil was low<sup>24,26</sup>. In the present study, although the number of interviewed was low, 63.16% of the caregivers took their children to have the first dose of HPV vaccine, demonstrating that in this population an increasing adherence to the HPV vaccine.

The lack of knowledge about HPV and its relationship with cancer in the male population, as well as how much information about the HPV vaccine in boys can be the main cause of low adherence to vaccination in the studied population. Penile cancer has a lower global prevalence than cervical cancer, being a rare malignant disease that affects middle-aged men (50 years), very rare in young individuals, and is related to low socioeconomic and educational conditions, poor intimate hygiene, and men who did not undergo circumcision<sup>16, 27-29</sup>. Studies also point out the relationship between the pathogenesis of certain penile carcinomas with HPV types 16 and 18, considered high risk, indicating a prevalence of the virus in neoplastic lesions in about 60% of cases<sup>11,17,27,30</sup>.

Currently in Brazil, the North/Northeast region is where the largest number of cases of penile carcinoma are concentrated. The main risk factors, such as low family income, low education, and poor hygiene, got these men in situations where they are more likely to become infected with the HPV virus and that this infection will develop into cancer (oropharynx, anus, and penis). The vaccine in this at-risk population enters as a prophylactic method, preventing infection by the main types of HPV and preventing the evolution to pre-malignant lesions<sup>16,27,28,31</sup>.

In the present study, the finding that women also lack knowledge about the relationship between HPV and cervical cancer was surprising. The lack of knowledge about the HPV virus and the consequences of its infection is demonstrated in studies so there is a direct relationship between lack of knowledge and lack of protection. As they do not have the correct information on HPV, the population is less likely to adhere to vaccines or protect themselves (condoms, prevention habits, and avoiding risky behaviors)<sup>32</sup>.

When it comes to infectious diseases, several factors are involved, such as demographic, social, economic, and environmental factors. In these diseases, it is common to observe that the most vulnerable population has low monthly income, low education, lack of access to basic sanitation, and difficulty in having access to health programs and treatments. Being the socioeconomic profile, an important factor in the evolution of the disease<sup>33</sup>.

HPV infection is also linked to socioeconomic factors, with a higher frequency in a population with low family income, low education, and in places where access to health services is precarious<sup>1</sup>. For this reason, it became necessary to analyze the profile of those responsible, looking for factors that interfere when deciding to vaccinate their children or not. Surprisingly, the socioeconomic profile of those responsible, in this population, does not seem to directly contribute to the lack of adherence to HPV vaccination in boys, having a low income or having high school education at higher levels does not contribute so much to decision making, as to lack of knowledge contributes.

When the HPV vaccine became available in 2014 in Brazil, there was a great mobilization by the Ministry of Health to publicize the vaccine, using television commercials and advertisements, to demonstrate the need for girls to get vaccinated, encouraging parents and responsible for vaccinating their children. All this effort resulted in great adherence on the part of the parents, with the effect of 85% of vaccination coverage. In 2017, the same effort was not made, and little was disclosed about the need to vaccinate boys too<sup>34</sup>. Many parents and caregivers still believe that boys are not at risk and that there is no need to get vaccinated. Thus, increasing the dissemination of this knowledge may increase adherence to the vaccine. The publicity vehicle that seems to reach this population the best is television (71.05%).

## CONCLUSION

Most of the caregivers who vaccinated their children had basic knowledge about the virus, indicating that knowing HPV motivated them to vaccinate their children. Lack of knowledge concerning the vaccine, nor about HPV, much less than the infection can lead to cancer of the penis and cervix are related with the lower adherence to HPV vaccine. Thus, increasing access to information, mainly through health promotion strategies to disseminate of vaccination campaigns using television can result in improved adherence to the HPV vaccination. As consequence, the protection of boys would be expanded, reducing cases of cancer in the future, and indirectly increasing the protection of girls.

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