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Article

Importance of School-Primary Care Interaction in Vaccination and Knowledge About HPV in the Public Education Network

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Abstract: Objective: To verify knowledge about HPV, promote educational action and encourage vaccination among students from 6th to 9th grade in the public school system of Campo Grande - MS. **Methods:** Conducting a structured interview. **Results:** It was noted that 70.1% had heard about HPV, however, 38.1% stated that it is a virus that causes cancer and 11.3% related it to the virus that causes warts. The free availability of the vaccine was known to 57.7% of participants and 62.3% were vaccinated with at least one dose. 79 students were vaccinated during the actions. **Conclusion:** There is a lack of knowledge, as the majority did not know how to relate HPV to the development of cervical cancer. The interaction between primary health care and schools resulted in the dissemination of knowledge about HPV, an increase in vaccine doses administered, favoring an increase in vaccination coverage among students.

Keywords: papillomaviridae; vaccines; cervical neoplasms; knowledge; Family Health Strategy

Introduction

The Human Papillomavirus (HPV) causes a sexually transmitted infection that manifests itself in the form of warts or asymptotically with low-risk types, but at least 14 types have a high oncogenic risk and can cause lesions that can develop into neoplasms, mainly of the cervix [1].

It is estimated that for each year of the 2023-2025 triennium, there will be 17,010 new cases of cervical cancer, with a crude incidence rate of 15.38 cases per 100 thousand women in Brazil, and 21.71 cases per 100 thousand women in the state of Mato Grosso do Sul, exceeding the national average. Cervical cancer had a mortality rate of 4.51 deaths per 100 thousand women in 2021 and 5.61 deaths per 100 thousand women in the Central-West region [2].

The application of strategies that demonstrate the profile and knowledge among elementary school students, who are the target audience for the HPV vaccine, is relevant, due to the high incidence of HPV among adolescents coupled with inadequate vaccination coverage, which occurs mainly due to limited knowledge, lack of interest, misconceptions related to the vaccine, linking the disease with sexual activity and difficulty in accessing health services [3].

Therefore, the objective of this study was to analyze the level of knowledge about HPV infection, promote educational action and encourage vaccination among students in the sixth to ninth year of elementary school in the public education network.

Methods

This is a descriptive, cross-sectional research, with a quantitative approach, with primary data collection, through structured interviews, carried out from September 2022 to April 2023 among

students from the sixth to the ninth year of municipal schools EM Professor Luiz Cavallon and EM Domingos Gonçalves Gomes in Campo Grande– MS.

The schools participating in the study were selected because they are made up of students with different socioeconomic profiles, as well as their grades in the IDEB (QEDU, 2022) , although located in the same region, in order to assess the level of knowledge among students at the schools selected [4] .

All students enrolled and present in the classrooms of the selected grades were invited to participate, with 308 students from EM Domingos Gonçalves Gomes and 423 students from EM Professor Luiz Cavallon. The invitation was made verbally during class time, with the delivery of a printed invitation, together with the Free and Informed Consent Form (TCLE) that had to be read and signed by the person responsible for the minor participant.

Prior to the interview, the participant who agreed to be included in the research and who submitted the informed consent form signed by the person responsible was presented and read the Free and Informed Assent Form (TALE) so that acceptance could be made to participate in the research.

The structured interview was carried out using objective questions about sociodemographic data and knowledge about HPV and the vaccine. Once data collection was complete, lectures were developed, with the participation of the students present and distribution of an educational folder, to raise awareness about aspects related to HPV and the importance of vaccination.

After the educational actions, all students within the vaccination age range were invited to be vaccinated in an action carried out in schools together with the health units in the coverage area (UBS Pioneira and USF Jardim Botafogo), with authorization from those responsible.

The study was approved by the Research Ethics Committee of the Federal University of Mato Grosso do Sul (CAAE nº 60894022.4.0000.0021 - Opinion nº 5,596,389 of August 22, 2022).

Results

Of the 731 invited students, 194 participated, 107 (55.2%) from EM Domingos Gonçalves Gomes and 87 (44.8%) from EM Professor Luiz Cavallon. The majority were female (63.4%; N=123) and most participants (91.8%) were between 11 and 14 years old (Table 1).

Table 1. Sociodemographic characteristics of students at schools EM Domingos Gonçalves Gomes and EM Professor Luiz Cavallon, Campo Grande, 2022.

SOCIODEMOGRAPHIC AND ECONOMIC CHARACTERISTICS			
Color/Race		Family income (in minimum wages)	
% (No.)		% (No.)	
Brown	54.1 (105)	Between 1 and 3 salaries	41.8 (81)
White	35.6 (69)	I didn't know how to answer	28.9 (56)
Black	8.2 (16)	Between 3 and 5 salaries	14.4 (28)
Yellow	1.5 (03)	More than 5 salaries	9.3 (18)
Indigenous	0.5 (01)	Less than 1 salary	5.7 (11)
Mother's education		Father's education	
% (No.)		% (No.)	
High school	37.6 (73)	I didn't know how to answer	38.1 (74)
Elementary School	23.7 (46)	Elementary School	24.7 (48)
I didn't know how to answer	19.1 (37)	High school	22.7 (44)
University education	17.5 (34)	University education	12.9 (25)
Postgraduate	1.0 (02)	Postgraduate	1.0 (02)
Literate	0.5 (01)	Literate	0.5 (01)
Illiterate	0.5 (01)	Illiterate	0.0 (00)
They live in the same house		Number of siblings	
% (No.)		% (No.)	
5 or more people	40.2 (78)	2 brothers	28.4 (55)
4 people	30.9 (60)	1 brother	27.8 (54)
3 people	22.7 (44)	I do not have siblings	12.4 (24)

2 people	3.2 (12)	3 brothers	12.4 (24)
Basic sanitation		5 or more siblings	9.8 (19)
	% (No.)	4 brothers	9.3 (18)
Potable water	97.9 (190)		
Garbage collection	97.9 (190)		
Sewerage system	92.8 (180)		
I didn't know how to answer	2.1 (04)		

The data showed that 70.1% (N=136) had already heard about HPV, however, 76.2% (N=148) were unable to answer what the virus causes. In this sense, 38.1% (N=74) associated HPV with cancer and only 11.3% (N=22) with the virus that causes warts.

An association was found for the variables sex, grade and education of the student's mother, with the fact that adolescents had already heard about HPV, demonstrating that girls ($p=0.0098$), participants in more advanced grades ($p=0.0324$) and those whose mothers had a higher level of education ($p=0.0146$) had more knowledge about HPV.

When students were asked if they knew what the cervix is, the majority denied (73.2%, N=142) and regarding the Pap smear test, 84% (N=163) reported not knowing the purpose of the test (Table 2).

Table 2. Levels of knowledge about HPV infection among students at participating schools EM Domingos Gonçalves Gomes and EM Professor Luiz Cavallon, Campo Grande – MS, 2022.

Levels of knowledge about HPV			
	YES	NO	DO NOT KNOW
	% (No.)	% (No.)	% (No.)
Do you know if HPV infection causes disease?	76.8 (149)	23.2 (45)	—
Do you think HPV could be related to some type of cancer?	61.3 (119)	19.6 (38)	19.1 (37)
Do you know if HPV infection is treatable?	80.4 (156)	5.7 (11)	13.9 (27)
HPV transmission			
			% (No.)
Intimate genital contact			61.9 (120)
Intimate contact through the mouth			35.6 (69)
Underwear, pool bath			33.0 (64)
Blood transfusion			27.3 (53)
Do not know			21.6 (42)
Skin contact			20.1 (39)
Symptoms related to HPV			
			% (No.)
Burning, pain			57.7 (112)
Bleeding			37.1 (72)
Genital warts			34.5 (67)
Tiredness			33.0 (64)
Loss of appetite			28.9 (56)
Discharge			28.4 (55)
I don't know			23.7 (46)
Has no symptoms			0.5 (01)
How to prevent cervical cancer			
			% (No.)
HPV vaccination			69.6 (135)
Preventive examination of the cervix			58.8 (114)
Do not share personal hygiene items			54.6 (106)
I don't know			14.4 (28)
Other ways			10.3 (20)
Where did you acquire knowledge about HPV			
			% (No.)

On TV	36.1 (70)
I had never heard of	32.5 (63)
With friends or family	30.9 (60)
Social networks, internet	20.6 (40)
At school	16.5 (32)
With doctors or nurses	16.0 (31)
Another place	5.2 (10)

Almost 40% do not know that HPV is an STI. The lack of knowledge among most adolescents related to transmission routes other than sexual contact, such as skin, mouth mucosa and even fomites, did not make a significant difference between the series.

The biggest sources of information about HPV were television and social networks (Table 3), however the portion related to the role of the school was mentioned by 16.5% of participants.

Table 3. Levels of knowledge about the HPV vaccine and distribution of participants according to vaccination *status* in participating schools EM Domingos Gonçalves Gomes and EM Professor Luiz Cavallon , Campo Grande – MS, 2022.

HPV vaccine			
	YES	NO	DO NOT KNOW
	% (No.)	% (No.)	% (No.)
Did you know that there is a vaccine against HPV?	84.5 (64)	15.5 (30)	--
Do you think this vaccine is important?	89.7 (174)	--	10.3 (20)
Did you know that this vaccine is available free of charge for teenagers in your age group up to 14 years old?	57.7 (112)	42.3 (82)	--
Have you already had the HPV vaccine?	49.0 (95)	38.7 (75)	12.4 (24)
Vaccination status			
	Reported by the student	Confirmed via the E-SUS system or vaccination card	
	% (No.)	% (No.)	
I didn't take any dose	41.2 (80)	32.5 (63)	
Two doses	25.3 (49)	40.7 (79)	
One dose	19.1 (37)	21.6 (42)	
I don't know how many doses/no data	14.4 (28)	5.2 (10)	
Reasons for not completing vaccination cycle ¹			
	% (No.)		
Unable to return to the health unit	32.6 (14)		
Forgot the scheduled date	30.2 (13)		
The family thought it was not necessary	4.6 (02)		
Another motive	32.6 (14)		
Reasons for not having been vaccinated ¹			
	% (No.)		
I didn't know about this vaccine	59.4 (66)		
I couldn't go to the health unit	16.2 (18)		
I didn't know boys could get vaccinated	9.0 (10)		
Fear of injection	9.0 (10)		
Fear of side effects	5.4 (06)		
My parents didn't agree to vaccinate me	0.9 (01)		
Reason for parental refusal ¹			
	% (No.)		
Need to know more about the virus and/or vaccine	75.0 (06)		
They don't know if the vaccine is safe	12.5 (01)		
Concern about side effects	12.5 (01)		
Religious belief	--		
Another motive	--		

¹ Non-compulsory answer questions.

There was no association between the student's response to having been vaccinated or not, and the variables, school, grade, sex, race, income and parents' education.

When data from the e-SUS system and vaccination records were consulted, vaccination coverage was perceived to be higher than that reported by students during the interviews, concluding that many of them were vaccinated and did not know, where 62.3% (N=121) of students would be vaccinated with at least one dose. Among those vaccinated, 65.3% (N=79) with two doses and 34.7% (N=42) with one dose.

Among the 121 vaccinated with at least one dose, most of them were in the 6th year (N=35 and coverage of 62.5%), followed by the 7th year (N=33 and coverage of 63.5%), 8th year (N=32 and coverage of 71.1%) and the 9th year (N=21) with fewer vaccinated participants which, although it is the series with fewer participants, totaled a coverage rate of 51.2% among its participants, the which raises concern, as these students were in the last age group to be eligible for the vaccine by the SUS, or had even lost the opportunity due to age-grade distortion.

The result of the vaccination actions was the immunization of 79 students, 34 at EM Professor Luiz Cavallon and 45 at EM Domingos Gonçalves Gomes, with 70.9% (N=56) receiving the first dose and 29.1% (N= 23) received the second dose, reflecting that the majority of students had never been vaccinated against HPV.

Analyzing the impact of the vaccination action, it was found that at USF Jardim Botafogo, which had a monthly average of 19.7 doses in 2022, in March 2023 when the action was carried out, 57 doses were administered, 34 of which were made by action at school. At UBS Pioneira, with a monthly average of 15.7 doses in 2022, it was possible to administer 45 doses during the action out of a total of 49 doses in April 2023 [5], concluding that the number of doses administered was practically tripled.

Discussion

In view of the objectives proposed in this study, the importance of knowledge among adolescents about HPV and the vaccine against this virus is highlighted, in order to promote adherence to vaccination and positively impact vaccination coverage and, consequently, the prevention of cancer uterine lap. In this study, it was possible to affirm that girls, participants in more advanced grades and those whose mothers had a higher level of education had greater knowledge about HPV, confirming that women normally have a greater interest in health-related issues.

As in other studies, the majority of participants reported having already heard about HPV [6,7], but 44.8% of them could not say exactly what it caused, not relating the term HPV to the virus that can cause cervical cancer and warts. These data point to the need for strategies that can provide knowledge to these adolescents, given that the majority of HPV infections are asymptomatic and can remain latent for a long period.

As in other studies, the majority of adolescents recognize the sexual route as the main route of transmission through intimate genital contact[8,9], however, although risk behaviors were not assessed in this study, another study states that adolescents put themselves in situation of vulnerability to infection and declare that condoms lose their usefulness when there is trust and stable relationships, basing the prevention of HPV infection and cervical cancer on the practice of gynecological exams, which are forms of secondary prevention[10].

In the context of primary prophylaxis, although condoms do not guarantee ideal protection, considering the possibility of transmission through contact with exposed areas or even through fomites, the low frequency of use during sexual intercourse[11], added to inadequate vaccination coverage, leads to a high incidence of STIs, cervical cancer or other HPV lesions, as well as a high rate of teenage pregnancy.

As in other studies[12], the biggest sources of information about HPV were television and social networks, however the portion related to the role of educational institutions was little mentioned, as in this analysis, where only 16.5% reported having acquired general knowledge about HPV at school. In this same study, 55% of the students approached reported never having studied about the Human

Papillomavirus at school and 46% said they had heard about the vaccine at school. Other studies show schools and health professionals as the main sources of reliable information about HPV[13], which suggests the need for investment in educational campaigns and information in school and health environments, especially about the symptoms and consequences of the infection[14].

The results of this study confirm that television is still the main source of information and entertainment for the majority of the Brazilian population[15]. Screens can be used as a resource to educate, motivate, bring knowledge and contribute to the formation of critical and questioning citizens in the context in which they are inserted[16], as long as they convey adequate information. From this perspective, in addition to educational content on the internet and television, other communication channels need to be made available with the aim of expanding knowledge about HPV and the vaccine, such as actions in schools, health units, during consultations and home visits by community health agents (CHA).

In other studies, access to social networks also appears among the instruments where knowledge about HPV was accessed[17], demonstrating a new possibility of democratizing health education. However, it is necessary to pay attention to the dissemination of false news, called *fake news*, which is an obstacle to increasing HPV vaccination coverage, as it questions, above all, the safety of the vaccine. Since the origin of vaccines, there have always been movements against immunization, however, in the last decade, they have gained strength and greater reach with access to digital media. As a result, it was possible to observe a significant reduction in Brazilian vaccination coverage in the last five years, which could precipitate the resurgence of previously controlled diseases, a reason for great concern among health professionals around the world, making it necessary to create strategies that reduce vaccine hesitancy and reinforce the importance of immunization[18].

In a study called "Knowledge and attitudes about the Human Papillomavirus and vaccination", it was observed that the majority of those surveyed had heard about the HPV vaccine[18]. In the study, the question was how it would be possible to encourage other people to get vaccinated against HPV and, among the reports, educational actions were cited as excellent strategies, with emphasis on activities in school environments, with the participation of parents or guardians of minors, with the aim of expanding knowledge and generating behavioral changes that increase adherence to immunization. This result corroborates the present research regarding the lack of knowledge on the subject.

The community health agent (ACS) has great importance in the active search, both for immunization, in rescuing adolescents up to the age of nineteen [18], and for cervical cancer screening, acting in consultation of vaccination cards and guidelines given during visits to homes, being a link between the community and the health unit.

Recently, the Ministry of Health accepted the recommendations of the WHO and PAHO WHO and started to adopt the single-dose regimen of the HPV vaccine in Brazil. Evidence has shown that the single dose regimen for people aged 9 to 20 years, without immunosuppression, provides protection against cervical cancer, equal to that of two or three doses in environments with high vaccination coverage. This measure has a positive impact on cost reduction, improved vaccine acceptance and, consequently, increased vaccination coverage[18].

A study that analyzed knowledge about HPV and vaccination among different audiences, including schoolchildren, adolescents, mothers, teachers, health professionals with higher education and ACS[9], detected different levels of understanding, and even health professionals had doubts and misconceptions about the subject. Therefore, strategies are needed so that CHWs can be qualified to dispel misconceptions, resolve doubts and assist in the dissemination of the vaccine and consequently improve vaccination coverage.

In an integrative review regarding adherence to the HPV vaccine among adolescents[20], the need to reformulate the vaccine presentation strategy was highlighted, as when related to protection against an STI, it makes adherence difficult, as parents are surrounded by care teenagers aged 10 to 14 find it difficult to approach issues related to sexuality with their children, consider them to be premature for sexual initiation and often fail to vaccinate their children because they do not want to encourage such an attitude.

It is essential that knowledge about HPV and immunization is made available to deal with the questions and concerns of both parents and students, making it necessary for the vaccine to be made available to adolescents like any other vaccine, investing in the provision of information that leads to disengagement from vaccination with the beginning of sexual life, as this causes concern in parents. It must be reinforced the importance of vaccination in this range due to the better immunological response and the fact that there has not yet been contact with the virus[21].

According to the WHO[22], the objective to reduce cases of cervical cancer in the world is to vaccinate 90% of girls by 2030, while for the National Immunization Program (PNI) the target is to immunize 80% of the target audience, but Brazil is still well below this target. It is essential that strategies are established to increase HPV vaccination coverage in the country.

Among the WHO's strategies to achieve the vaccination coverage target, it is recommended that there be better evidence-based communication, as well as an effort for social mobilization. Social and cultural barriers need to be understood, as well as how they can affect vaccine acceptance. It is necessary that national guidelines, policies and strategies are updated according to new evidence, as well as the need for more efficient approaches to vaccination against HPV[22].

Among the proposed strategies is vaccination as a form of primary prevention, recommending that the vaccine can be more accessible to all countries, that the quality and coverage of vaccination can be increased through the use of multisectoral strategies, such as school immunization and approaches that can reach vulnerable populations, such as teenagers who are not in school, as well as combating misinformation as a way to overcome vaccine hesitancy[22].

The regionalization strategy, based on microplanning adopted by the Ministry of Health with the launch of the National Movement for Vaccination, sought viable solutions for the reality of each location, with adaptations according to the population, health structure, socioeconomic and geographic reality, establishing strategies such as vaccination in schools, expanding immunization room hours and actively searching for unvaccinated people[23].

In view of this, we must remember the importance of the ACS in accessing adolescents who are not in school, as well as all other ESF professionals and teams must help to dispel misconceptions and act as multipliers of health education for the population assisted in the unit.

Among the actions recommended by PAHO through the Action Plan for the prevention and control of cervical cancer are community education through the intensification of information, education and guidance[25].

The research also revealed a deficiency in assistance provided by the School Health Program (PSE)[26], which was created with the aim of bringing primary care closer to public school students. The project's partner nurses reported that work overload and insufficient professionals make it difficult to carry out activities outside the unit, and that they only do so when asked to do so. The pandemic period also directly impacted the execution of PSE actions, due to the closure of schools and removal from the school environment[27].

With the aim of contributing to the reduction of HPV infection rates and, consequently, cervical cancer, it is proposed that educational activities be developed anchored in the concepts of popular and permanent education, based on listening to others and to oneself and ensuring that subjects are protagonists of the educational process. It is necessary to raise awareness of the sexual partner in the treatment of STI; the sharing of knowledge with the user of the health service, that the environments of homes, schools and health units are suitable for pedagogical processes free of restrictions, which can encourage the breaking of taboos, fear and shame. In this logic, it is necessary to develop dynamic lightweight technologies that are in tune with the technological world, in order to become attractive and able to meet the demands of adolescents and young people[9].

In conclusion, a lack of knowledge can be observed, since most have already heard about HPV, however, most of them were unable to say that HPV can trigger cervical cancer. Many are unaware of the forms of transmission other than sexual contact, the clinical manifestation through warts and the availability of the vaccine free of charge through the SUS for boys and girls aged 9 to 14 years.

It is important to emphasize that many adolescents do not realize the importance of vaccination and the vulnerabilities to which they may be subject, showing the need for more effective public

policies and health education actions, using strategies that arouse the interest of adolescents. It is knowledge that allows a greater understanding of the risks of HPV infection, its relationship with cervical cancer and the importance of vaccination.

It is necessary to intensify actions that bring health units closer to schools, both educational actions and the availability of vaccines in schools, as it is clear that vaccination coverage will hardly be achieved without their participation.

The development of actions in the area covered by the Family Health Strategy, which aim to analyze the level of knowledge about HPV and which encourage vaccination, show their relevance, since awareness can be the key to greater adherence to vaccination, improving indicators of HPV infection in both men and women, reducing cases of cervical cancer and other types of cancer related to HPV and consequently reducing mortality related to the development of malignant neoplasms.

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