KNOWLEDGE AMONG COLLEGE STUDENTS AND EMPLOYEES OF LOCAL HEALTH UNITS ABOUT HUMAN PAPILLOMAVIRUS AND CERVICAL CANCER AND ITS IMPLICATIONS FOR PUBLIC HEALTH STRATEGIES AND VACCINATION

CONHECIMENTO ENTRE ESTUDANTES UNIVERSITÁRIOS E FUNCIONÁRIOS DE UNIDADES LOCAIS DE SAÚDE SOBRE PAPILOMAVÍRUS HUMANO E CÂNCER CERVICAL E SUAS IMPLICAÇÕES PARA ESTRATÉGIAS DE SAÚDE PÚBLICA E VACINAÇÃO

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ABSTRACT

Introduction: Human papillomavirus (HPV) is the most commonly diagnosed sexually transmitted infection worldwide. It is estimated that 70% of cervical cancer cases are related to high-risk HPV 16 and 18 types; and 90% of genital warts to HPV 6 and 11. Despite its prevalence and significant associated morbidity, the knowledge about the infection and its prevention remain limited. **Objective**: To evaluate the knowledge about HPV, its relation to cervical cancer and genital warts and the HPV vaccine among students of The Federal University of Santa Catarina and employees of local health units in the city of Florianópolis, Santa Catarina, Brazil. **Methods**: A descriptive cross-sectional analysis with 136 college students from the health care area or not and 77 employees from local health units, assessed through questionnaires including demographic data, lifestyle habits, characteristics of HPV infection and HPV vaccine. Data were analyzed using IBM software programs SPSS 20.0 and Epi Info 6.04, and the possible associations between variables were tested using the χ^2 test. **Results**: 94,3% of participants reported knowledge about HPV, and 77,93% about HPV vaccine. HPV was identified as causing cervical cancer by 67,86% of the subjects in school, 55,22% of individuals from higher education without training in health and 94,91% of individuals with training in health. Only 3,75% of the respondents received the vaccine, despite 90,61% saying that would allow their child to receive it. **Conclusion**: Knowledge about HPV infection, its consequences and prevention, both in people in school and in higher education is still very limited.
Keywords: Papillomaviridae; Papillomavirus vaccines; Papillomavirus infections; public health.

RESUMO

Introdução: O papilomavírus humano (HPV) é a infecção sexualmente transmissível mais diagnosticada em todo o mundo. Estima-se que 70% dos casos de câncer cervical estejam relacionados aos tipos de HPV de alto risco 16 e 18 e 90% das verrugas genitais aos tipos 6 e 11. A despeito de sua grande incidência e da importante morbidade associada, o conhecimento sobre a infecção e sobre suas formas de prevenção permanecem limitados. **Objetivo:** Avaliar o conhecimento sobre o HPV, sua relação com o câncer de colo de útero e verrugas genitais e sobre a vacina contra o HPV, entre estudantes da Universidade Federal de Santa Catarina e funcionários de unidades locais de saúde do município de Florianópolis. **Métodos:** Trata-se de um estudo transversal e descritivo, no qual 136 universitários da área da saúde ou não e 77 funcionários de unidades locais de saúde foram avaliados através de questionários incluindo dados demográficos, hábitos de vida, características da infecção pelo HPV e da vacina contra o HPV. Os dados foram analisados com o uso dos programas IBM Software SPSS 20.0 e Epi Info 6.04 e as possíveis associações entre as variáveis foram verificadas com o teste do χ^2. **Resultados:** 94,3% dos participantes afirmaram conhecimento sobre o HPV e 77,93% sobre a vacina contra o HPV. O HPV foi identificado como causador do câncer de colo de útero por 67,86% dos indivíduos de ensino médio/básico, 55,22% dos indivíduos de ensino superior sem formação na área da saúde e 94,91% dos indivíduos com formação na área da saúde. Apenas 3,75% dos entrevistados receberam a vacina, apesar de 90,61% afirmarem que permitiriam que seu(sua) filho(a) a recebesse. **Conclusão**: O conhecimento sobre a infecção pelo HPV, suas consequências e prevenção, tanto entre as pessoas com nível básico/médio quanto entre as pessoas com ensino superior é ainda muito limitado.
Palavras-chave: Papillomaviridae; vacinas contra Papillomavirus; infecções por Papillomavirus; saúde pública.

INTRODUCTION

The Human papillomavirus (HPV) is the most often diagnosed sexually transmitted infection worldwide. The infection is associated to anogenital warts and pre-malignant and malignant lesions of both anogenital (cervical, vaginal, vulvar, penile and anal) and extra-genital areas (head and neck)[1,2].

Currently, there is no doubt that HPV is the cause of cervical carcinoma[3], which was the most frequent malignancy found among women in developed countries, until it was overcome by breast cancer, in the early 1900s. Up until today, it remains at 371 thousand cases diagnosed annually worldwide[1].

There are over 45 genotypes of the virus which may affect the genital area, both for men and women, classified into high and low level[2].

The low-risk oncogenic HPV types 6 and 11 are responsible for over 90% of genital warts cases and for a number of cases of low-risk intraepithelial neoplasia of uterine cervix and vulva[4]. The high-risk oncogenic HPV types 16 and 18 are the most common in cervical cancer, representing 71% of the cases[5].

Study carried out at the Teaching Hospital and Health Centers of Florianópolis (SC), Brazil.
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The high-risk oncogenic HPV show tropism for cells of the uterine ectocervix transitional epithelium, infecting them and inducing neoplastic changes[6]. In this junction region between the endocervical columnar epithelium and the squamous stratified ectocervical epithelium, the constant cell proliferation easily allows the incorporation of the viral genome to the cellular genome[5].

Studies on the epidemiology of the genital HPV infection show a greater prevalence among young women, aged up to 25 years old, and with a trend to decline with advancing age[7]. This standard is possibly explained by the development of an adaptive immune response which could prevent future infections[8].

Although most cases of infection by HPV are related to sexual transmission, it may also occur non-sexually, by contact with skin warts, by fomites (sharing towels, underwear, etc.) and by maternofetal contact (pregnancy, intra- and peripartum)[9].

In most individuals the HPV infection is asymptomatic and transient, considering that 70% of new infections resolve in up to one year and, for the rest of it, about 90% in two years[4]. Epidemiological studies show that a small number of women infected by high-risk HPV will progress to high-degree lesions and cancer. The risk of progression into invasive cancer depends on factors such as the type of HPV, the viral load and the persistent presence of the virus[10]. When that occurs, the mean time between the initial infection and the cervical cancer manifestation is approximately 15 years[11].

The epidemiology of infection by HPV in the genital tract is similar to the one by cervical cancer, including the emerging of intraepithelial lesions before the cervical carcinoma appears[12]. The long interval in the progression of the high-risk cervical lesion into an invasive cancer allows great opportunity of identification of the premalignant lesion by screening programs. Regular Pap smears, as well as the proper follow-up and treatment of the precancerous lesions may help preventing the development of most cervical cancer cases[13].

The expenses involved in the treatment of cervical cancer, the failure to access Pap smears test in various regions and the non-elimination of transmission risk by using condoms[14] reveal the great clinical importance of the development of a prophylactic HPV vaccine. Thus, vaccination appears as a promising tool in the prevention of cervical cancer and other diseases associated to HPV[15].

Two vaccines were developed and approved by the National Health Surveillance Agency (*Agência Nacional de Vigilância Sanitária* – ANVISA) for primary prevention of HPV an both of them have shown high effectiveness levels. The quadrivalent vaccine protects against anogenital cancer and against genital warts by HPV types 6, 11, 16 and 18, which are responsible for 70% of the cases of cervical cancer and over 90% of the cases of genital warts. The bivalent vaccine, in turn, is exclusively directed for the prevention of cervical cancer induced by HPV types 16 and 18[16].

Studies published by the International Agency for Research in Cancer (IARC) prove the safety and efficacy of the HPV vaccine, able to reduce by 70% the probability of developing cervical cancer[17].

Many countries already introduced the HPV vaccine in their vaccination programs in the public health system[18]. In Brazil, both vaccines are licensed by ANVISA, and the quadrivalent vaccine is in the National Immunization Program (*Programa Nacional de Imunização* – PNI) since 2014 for girls from 9 to 13 years of age.

The popular acceptance to immunization is influenced by different levels of knowledge on sexually transmitted infections, their causes and forms of prevention, as well as particular religious beliefs on practices of health and sexuality[19].

Researches on the acceptance of the vaccine among teenagers, among their legal guardians (parents) and among health professionals show great influence of factors such as cost, existence of medical recommendation and safety of the vaccine[20]. From the parents' point of view, the knowledge on the benefits of the HPV vaccine, the medical history of more than two sexual partners of their children and the recommendations of health professionals emerge as determining factors[21].

Similarly to what was found in other countries, studies developed in Brazil reveal that very little is known about HPV among the general population. It was noticed that, in a group of 204 women in a Brazilian city, two thirds of them did not know what diseases the HPV causes and, despite 73% of women having reported moderate to great fear of having cervical cancer, less than 10% of them knew that the virus could be related to it. Meaning, the lack of knowledge on HPV and its consequences coexist with the perception of high susceptibility to cervical cancer [22].

OBJECTIVE

To evaluate the knowledge on HPV infection, its relation to cervical cancer and the forms of prevention among college students of the Federal University of Santa Catarina, health academics or not, and among employees of the health units in the city of Florianópolis, with college education or not. The data obtained were correlated in order to identify the factors associated to the knowledge on HPV and their forms of prevention, as well as the recognition of barriers to the use of HPV vaccine.

METHODS

It is a descriptive and cross-sectional study carried out in the campus of the Federal University of Santa Catarina (UFSC) and in local health care units (LHU) of Itacorubi, Barra da Lagoa, Campeche and Ingleses, in the period from October 2012 to March 2013.

A structured questionnaire was applied, previously validated, for 51 academics of the first period and 33 of the eighth period of the medical school, 21 academics of the sixth period of the economics course, 18 academics of the sixth period of civil engineering, 13 academics of the sixth period of pedagogy, 17 employees of LHU of Campeche, 14 employees of the LHU of Barra da Lagoa, 20 employees of the LHU of Ingleses and 26 employees of the LHU of Itacorubi. From the total of 213 people who answered the questionnaire, 28 of them had high school/elementary education and 185 of them had complete or incomplete college degree, considering that, from those, 118 of them showed higher education in the health area.

Men and women aged over 18 years old who read, agreed and spontaneously signed the Informed Consent were included in the research. The exclusion criteria were: illiteracy, psychiatric comorbidity or cognitive impairment of comprehension and an appropriate answer to the questionnaire.

The questionnaire by which the participants were evaluated had objective questions, approaching variables on demographics, life habits, characteristics of HPV infection and HPV vaccine.

The data were obtained through the individual answer to the structured questionnaire. The demographic variables approached were: age, gender, marital status, ethnicity, sexual orientation and family monthly income. The family monthly income was analyzed in income groups according to the *Classificação do Centro de Políticas Sociais da Fundação Getúlio Vargas* (CAPS/FGV) in classes A, B, C and D. The variables related to the life habit was the perception of risk of acquiring a sexually transmitted disease (STD).

The knowledge on HPV and the HPV vaccine was approached by 10 questions. The first question referred to having already heard about HPV. In affirmative case, options of knowledge obtaining source could be marked, such as magazines and books, Internet, family and/or friends, academic education and medical consultation. The second question concerned having already heard about HPV vaccine. The third question was about having received at least one dose of the vaccine, and the answer could be yes or no. In negative case, reasons for not doing it could be indicated, such as lack of knowledge on the matter, disbelief in the benefits, not considering indication cases, fear of side effects, and unwillingness to pay and absence of financial good conditions. The fourth question regarded the permission to their kid to being shot with the vaccine. The six following questions were of an objective content about the characteristics related to the HPV and to the vaccine. The question of this last part were about: the possibility of infection by HPV causing genital warts; the sexual relations being a form of contagion; the potential for the infection to cause cervical cancer; the use of HPV vaccine to reduce or not the frequency and needs of gynecological tests; having the HPV vaccine shot to protect against cervical cancer; the vaccine excluding or not the need to use condoms.

The application of the questionnaires was carried out during school year in classrooms of the campus of Trindade of UFSC and in LLHUs, during the monthly meeting of the unit.

The present study followed the criteria of the Research on Human Beings Ethics Committee (CEPSH) of the UFSC, as determined by the Resolution No.196/96 of the National Health Board (*Conselho Nacional de Saúde* – CNS). The final approval by this committee was in February 2013, under the number 209.009.

The analysis of the data was carried out by IBM Software SPSS 20,0® and Epi Info 6.04. The results were obtained by percentage calculations. In order to verify the possible associations between the acceptance of the vaccine, the knowledge about it and the HPV and the variables, a chi-square test (χ^2) and a Fisher's exact test were performed, confidence interval of 95%. The result was considered significant if the probability of an error were 5% ($p<0.05$). When the p-value did not show significance, it was presented as p=ns.

RESULTS

201 participants having knowledge on HPV (94.37%) aged around 27 years old. Of those, 80 individuals were male, 96.38% of the total men, and 121 individuals were females, 93.08% of the total women. Three men and nine women abstained from this answer (**Table 1**).

166 participants claimed knowledge about the vaccine (77.93%) aged 27.91 on average, from which 62 individuals (74.7%) were male and 104 (80%) female. Six females and no males abstained from this answer (**Table 1**).

The correlation between the marital status of the interviewee and the knowledge about HPV and the vaccine do not show statistically significant differences. However, there was a little higher percentage of knowledge on HPV among divorced people, 6 (100%) and single ones, 142 (97.26%), in relation to married ones, 44 (91.67%) (**Table 1**).

As for ethnicity, the knowledge about HPV was seen in 175 (95.11%) of white/caucasian respondents, followed by 15 (93.75%) of brown people, 7 (87.5%) of black and 3 (75%) asians. The prevalence of knowledge about the vaccine was 142 (77.17%) among white/caucasian people, followed by 6 (75%) black, 15 (93.75%) brown and 3 (75%) asian ones. There was a single self-reported indigenous individual, considering that they claimed having knowledge on HPV by ignorance about the vaccine (**Table 1**).

The correlation between sexual orientation and the knowledge about HPV also did not show statistical relevance. From the respondents, 185 (94.87%) of the heterosexual and 11 (100%) of the homosexual stated knowing about HPV. The homosexual showed having more knowledge about the vaccine (81.82%) than the heterosexual group (78.46%) (**Table 1**).

As for the level of school education and the knowledge about HPV and the vaccine, despite having no statistical significance, it was observed that 25 (89.29%) of the individuals with elementary/high school degree and 176 (95.13%) of the individuals with college degree state having knowledge on about HPV. In relation to the vaccine, the higher prevalence of knowledge was in the individuals with elementary/high school degree 22 (78.57%), followed by 144 (77.84%) of the individuals with college education (**Table 1**).

The relation between the social class, the knowledge about HPV and the vaccine showed that from the individuals in social class A, 37 (97.37%) had knowledge about HPV and 29 (76.31%) had knowledge on the vaccine. In turn, individuals in class B, 13 (100%) knew about HPV and 11 (84.61%) knew about the vaccine. Among individuals in class C, 124 (93.94%) knew about HPV and 105 (79.54%) about the vaccine. And in class D, 13 (92.86%) knew about HPV and 8 (57.14%) about the vaccine. Although the relation between the social class, the knowledge about HPV and the vaccine did not show statistically significant differences, it is observed a lower level of knowledge between individuals in classes C and D, specially in relation to the knowledge about the vaccine (**Table 1**).

When questioned about the risk of getting a STD, among the individuals who stated knowing about HPV, 87 of them answered they do not consider themselves at risk (43.28%); 92 consider themselves at low risk (45.77%); 12 of them at moderate risk (5.97%); and 6 of them at high risk (2.98%). There were four abstentions (1.99%). Among those who stated knowing about the vaccine, 71 individuals do not consider themselves at risk (42.77%); 74 consider themselves at low risk (44.58%); 11 of them at moderate risk (6.63%); and 6 at high risk (3.61%). In this group, 4 individuals abstained (2.41%) (**Table 1**).

When we assess the knowledge about HPV, 89.29% of the respondents with elementary/high school education levels have already

heard about HPV, compared to 88.06% with college degree, in this case considering just the individuals without formation in the health area. Among the respondents with elementary/high school level, most of them obtained information through books/magazines (40%) and in their academic formation (40%). In the group with college degree in areas other than health, most people obtained information in books/magazines (45.76%) and with family/friends (35.59%). The vast majority of respondents in the college degree in health group stated knowing about HPV (99.15%), most of them during their academic graduation. It was surprising the little information obtained in medical appointments. In this aspect, more than one option may be signaled (**Table 2**).

When assessing the information about HPV, it was noticed an impressive lack of knowledge of 60% of participants with college education in areas other than health about HPV as the cause of the genital warts and also for college level in health areas (20%). About 15% of the participants in areas other than health believe that HPV is not a STD. Even more alarming is the fact that 28% of the participants with elementary/high school education and 45% of the ones with college degree in other areas than health have no knowledge that HPV is the cause for cervical cancer (**Table 3**). Individuals with college degree in areas other than health have a risk 70% higher of not knowing that HPV causes genital warts in relation to the individuals with elementary/high school education, with relative risk (RR) of 1.72 (p=0.02).

When questioned if they had already heard about the HPV vaccine, 22 individuals (78.57%) with elementary/high school degree stated that yes, while 4 (14.28%) of them claimed not having heard about it. From the individuals with college degree without formation in the health area, 36 (53.73%) of them have already heard about the vaccine, while 29 (43.28%) of them have no knowledge of such. Therefore, the individuals with college degree had three times higher risk of not knowing about the vaccine in comparison to the ones with high school education (RR=2.90; p=0.0008) (**Table 4**).

Of the 28 individuals with elementary/high school education, only one of them reported having used the vaccine and 2 did not answer to the question. As for the justification, 16 people (64%) abstained from answering, most of them did not use it due to the cost of the vaccine (6 participants; 24%) (**Table 4**). None of the respondents marked the option regarding disbelief in the benefits of the vaccine. It should be noted that, in this regard, there was the possibility of marking more than one option. Despite the little use of the vaccine,

Table 1 – Demographic data and information about HPV and HPV vaccine.

Variables	HPV			HPV vaccine		
	n	%	p-value	n	%	p-value
Gender						
Men	80	96.38	ns	62	74.40	ns
Women	121	93.08		104	80.00	
Color						
White/Caucasian	175	95.11	ns	142	77.17	ns
Black	7	87.5		6	75.00	
Sexual orientation						
Heterossexuals	185	94.87	ns	153	78.46	ns
Homossexuals	11	100		9	81.82	
Level of school education						
Elementary/High School education	25	89.29	ns	22	78.57	ns
College education	76	95.13		144	77.84	
Social class						
A	37	97.37	ns	29	76.31	ns
B	13	100		11	84.61	
C	124	93.94		105	79.54	
D	13	92.86		8	57.14	
Consider oneself at risk of having na STD?						
No	87	43.28	ns	71	76.34	ns
Low risk	92	94.98		74	76.29	
Moderate risk	12	92.31		11	84.61	
High risk	6	100		6	100	

ns: non significant

Table 2 – School education and information sources about HPV.

Question	Elementary/high School (n=28)		College (not in a health areas) (n=67)		p-value	College (in a health area) (n=118)	
	n	%	n	%		n	%
Already heard about HPV (where?)	25	89.29	59	78.57	<0.05	117	99.15
Books/magazines	10	40.00	27	45.76	ns	58	49.57
Internet	5	20.00	21	31.34	ns	46	39.32
Family/friends	3	12.00	13	35.59	ns	20	17.09
Academic formation	10	40.00	23	34.33	ns	103	88.03
Medical appointment	5	20.00	14	23.73	ns	20	17.09
Abstention	5	17.8	9	13.43		–	–

ns: non significant

85.71% of the individuals with elementary/high school education answered that they would allow their children to get the vaccine shot (**Table 4**).

Among the 67 individuals with college degree in the health area, only 1 has already been shot with the vaccine and 3 did not answer to the question (**Table 4**). Among the 63 people who claimed not having been vaccinated, 5 people (7.94%) abstained from answering. The vast majority did not use the vaccine because they do not know about it (65,08%). Again, none of the respondents marked the option regarding disbelief in the benefits of the vaccine (**Table 5**). When questioned if they would allow their children to get the vaccine, 57 (85.07%) of them answered they would (**Table 5**).

Few participants in the 3 groups know that the HPV vaccine protects against cervical cancer (17.86% of the group with elementary/high school education, 13.34% of the volunteers with college degree in the health area and 41.52% of the group with college education in a health area). There was no statistically significant difference among these three groups.

When questioned whether women vaccinated against HPV need less frequent gynecological examinations, 10 individuals (35.71%) with elementary/high school education answered no, and 23 (82.14%) answered that the HPV vaccine does not exclude the need to use condom during sex. Among individuals with college degree without formation in the health area, 46 (68.66%) answered that the

Table 3 – Information about HPV and education degree.

Question	Elementary/High School (n=28)		College (not in a health area) (n=67)		p-value	College (in a health area) (n=118)	
	n	%	n	%		n	%
HPV causes genital wart	17	60.71	27	40.30	0.02	95	80.51
Abstention	2	7.14	–	–		3	2.54
HPV causes cervical cancer	19	67.86	37	55.22	ns	112	94.91
Abstention	1	3.57	1	1.49		3	2.54
HPV is an STD	25	89.29	57	85.07	ns	114	96.61
Abstention	1	3.57	–	0		3	2.54

ns: non significant

Table 4 – Information about the HPV vaccine and the education degree.

Question	Elementary/High School (n=28)		College (not in a health area) (n=67)		p-value	College (in a health area) (n=118)	
	n	%	n	%		n	%
Already heard about the HPV vaccine	22	78.57	36	53.73	0.0008	108	91.52
Abstention	2	7.14	6	8.00		2	1.69
Already used the HPV vaccine	1	3.57	1	1.49	ns	6	5.08
Abstention	2	7.14	3	4.48		2	1.69
Would allow their children to get vaccinated	24	85.17	57	85.07	ns	112	94.91
Abstention	4	14.28	4	5.97		2	1.69
The vaccine protects against cervical cancer	5	17.86	9	13.43	ns	49	41.52
Abstention	4	14.28	1	1.49		3	2.54
Vaccinated people =fewer gynecological exams	7	25.00	4	5.97	ns	7	5.93
Abstention	1	3.57	–	–		2	1.69
Vaccinated people do not need condoms use	3	10.71	–	–	ns	1	0.85
Abstention	2	7.14	1	1.49		2	1.69

ns: non significant

Tabela 5 – Motivos para não realizar a vacina contra HPV e grau de ensino.

Alternative	Elementary/High School (n=28)		College (not in a health area) (n=67)		College (in a health area) (n=118)	
	n	%	n	%	n	%
Unknown	2	8	4	65.08	18	16.36
Does not believe in the benefits	–	–	0	–	3	2.73
Does not consider oneself as a suitable indication	–	–	9	14.28	27	24.54
Fear of side effects	1	4	1	1.59	3	2.73
Not willing to pay for it	3	12	8	12.70	31	28.18
Does not have financial conditions	3	12	3	4.70	12	10.90
Abstention	16	64	5	7.90	18	16.30

vaccination should not reduce the frequency of gynecological examinations and 66 (98.51%) believe the vaccine does not exclude the need to use condoms.

In relation to the 118 individuals with college education in the health area, 94 people (79.66%) stated the vaccination against HPV should not be the reason for reducing the frequency of gynecological examinations and 115 people (97.45%) believe the vaccine does not exclude the need to use condoms.

DISCUSSION

Most studies addressing the knowledge about cervical cancer, HPV infection and HPV vaccines focus on a sample of women at a specific age range or focus on the opinion of young parents about the use of the vaccine[20,23]. This specific study included men and women, in different age ranges, from various socioeconomic status and with graduation in the health area or not. Encompassing, thus, a more diversified and heterogeneous sample.

The mean age of the participants in this study was approximately 27 years of age. This data is correlated to the participation in higher number of college students, who, on average, are younger.

Almost 95% of the participants state having already heard about HPV. A lower level of knowledge is found in some researches with the general population[22]. The data obtained are in agreement with other studies carried out with college students and health professionals, that, according to Medeiros et al.[24], would lead to believe that working in the health area and/or having a college education is associated to a greater awareness on the existence of this virus.

All homosexuals who took part in this study claim having heard about HPV and the number of them with knowledge about the vaccine was also higher than among heterosexuals. Maybe this fact is related to a greater knowledge of the STD in general, specially due to HIV infection, whose programs and prevention campaigns focus on the awareness of this group, especially at the beginning of the epidemic.

The discussion about HPV infection, as well as the effects of the vaccine on men is recent[25]. Some studies report men who are sexually active or have already had a STD or who consider themselves under high risk of HPV infection have greater acceptance to the vaccine[26]. An article developed in Australia shows that the acceptance to the vaccine against HPV tends to be higher among men who have sex with men. In this case, the interest for the vaccine could be justified by the higher rates of anal cancer associated to HPV[27].

In other studies, only six participants consider themselves under high risk of having an STD, and all of them state having already heard about HPV and the vaccine against it. Recognizing the risk of having an STD may be involved with knowingly risk behaviors also for the HPV, such as the early beginning of sexual activity, the multiplicity of sexual partners and the lack of use of condoms[28]. The fact of the second greater prevalence of knowledge about HPV is among individuals who consider themselves at low risk of getting an STD supports the initial premise of the study, that the knowledge is connected to the public policies. The people who consider themselves at low risk of having an STD probably believe already using all other possible kinds of prevention, including the use of condoms, so widely spread in campaigns against HIV and STDs in general, though they do not guarantee 100% prevention against HPV[28]. Meaning, possibly, the perception of risk is underestimated among the ones who state knowing about HPV.

The absence of approach about HPV in public STD campaigns may again be noticed due to the lower knowledge among individuals with college education in areas other than health. A college education does not ensure information about STDs, once those are not a part of the curricula of the courses at matter. The source of information would be more related to public policies, which are insufficient for not providing basic information about HPV, about its association to genital warts, STDs and cervical cancer. The limitation of the existing knowledge was even more meaningful in relation to the vaccine, which would already be expected given the little information given out regarding it.

A positive example of the effects of education about this knowledge was highlighted by the research in relation to people with elementary/high school education. In this research, these individuals are LHU professionals and, despite not having a college degree, they work in places where most STD cases in the municipality are taken care of and they have annual trainings provided by the Municipal Health Department (*Secretaria Municipal de Saúde*), with emphasis on infectious diseases, such as STDs[29]. These professionals are daily involved with matters related to information and preventive practices, such as the Pap smear test, which contributed positively for a greater knowledge about HPV, as observed in the 89% of the ones who stated having heard about HPV.

The individuals with a college degree in a health area, as found in other national studies[30], presented greater knowledge about HPV and the HPV vaccine. This is probably due to the curricular formation which approaches the virus, its relation to cervical cancer and other disease and the forms of prevention. As expected, education was relevant as for the knowledge and the vaccination. From the small number of respondents who stated having been vaccinated against HPV, two thirds of them had college education in a health area. These findings are comparable to those seen by Medeiros et al.[31], in their study with college students in Portugal. In this one, 79.3% of the students of health related areas had already heard about HPV, in relation to only 14% of students in other courses. When questioned about the use of the vaccine in case it was available, 89% of them responded positively: 93.4% students of health and 98.3% students of other areas. Similarly to our study, the college education in the health area is associated to a greater knowledge about HPV. Contradictory to our findings, the acceptance of the vaccine was higher among students of areas other than health.

Despite only 6 people among the respondents having received HPV vaccination, over 90% of the participants would allow their children to get it. The belief in the efficacy of the vaccine is confirmed given the reduced mention to the discredit in its benefits as a reason not to do so. The most often reasons mentioned for not doing so were not considering it to be referred as a case and problems to pay. Meaning, the vaccine is greatly accepted and what hinders its use is the high cost and lack of information. Both reasons could be solved in case there were campaigns for awareness about HPV and the inclusion of the vaccine in the public vaccination calendar. It is imperative to change the high numbers of HPV infection, the enlightenment of the population about what is HPV and its relation to cervical cancer, associated to information about

prophylactics action of the vaccine and to the long term immunity, which characterize its indication for teenagers before the beginning of their sexual life, though it does not exclude the possibility of benefits at a later age.

The result is similar to the one found by Black et al.[32], in a study about the acceptance of the vaccine among Americans aged over 26 years old. It should be noted that, in the United States, the HPV vaccine is currently licensed only for women aged between 9 and 26 years old, so that women above this age range would not have free access to the vaccine.

Despite most participants stating having heard about the HPV vaccine, it was noticed in all levels of education, that having information about the existence of something does not mean knowing all its implications. It is alarming the number of participants who state that vaccinated women would require less frequent gynecological exams and who claimed vaccinated women do not need to use condoms during sex. Meaning, claiming having heard of the vaccine does not mean they understand its protection is exclusive to some types of HPV and not for all STDs. The result is common to the one found by Carvalho et al.[30], in a study on the perception of the HPV vaccine among medicine students and doctors affiliated to the Federal University of Paraná. In this one, although all participants had formation in a health area, 75.3% of them do not understand that the vaccine does not cover all types of HPV and that, therefore, the Pap test would still be necessary regardless the vaccination.

The HPV is a STD which has some particularities, thus, despite having a contagion route similar to other STDs, its association to cervical cancer, as well as the particular forms of prevention, require a more unique approach. An example of feasible and relevant public policy would be the creation of compulsory subjects in the elementary and high school curriculum about the use of drugs, sexuality and related diseases. The few existing initiatives in this regard have great resistance of the parents who believe that the approach of these matters would stimulate the early development of sexuality in their children. However, the beginning of an early sex life is a fact and the approach of the matter by professionals, in a proper way, would allow the perception not as a stimulus, but as a guidance.

CONCLUSION

Despite most people having heard about HPV, it is alarming the ignorance of the population, including in the health area, about the relation of this virus to cancer and genital warts, its sexual transmission and the benefits of the HPV vaccine in the prevention. New studies, with different population, must be carried out in order to demonstrate to the government the importance of a form of prevention which is highly effective and safe such as the HPV vaccine in the public system, especially in Brazil, which annually has around 20 thousand new cases of cervical cancer and 8 thousand deaths associated to it.

Conflict of interests

The authors report no conflict of interests.

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