Nursing students' knowledge on the human papillomavirus vaccine

Conhecimento de acadêmicos de enfermagem sobre a vacina contra o papilomavírus humano

Conocimientos de académicos de enfermería sobre la vacuna contra el virus del papiloma humano

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Abstract

Objective: To assess nursing students' knowledge on the human papillomavirus vaccine and compare the results obtained among students of the first and last year of graduation.

Methods: This is a descriptive, cross-sectional, quantitative study, conducted between May and June 2019. A questionnaire was applied to 179 nursing students from a public university in the state of São Paulo, containing sociodemographic data and another on knowledge of human papillomavirus and the vaccine against it. Data were analyzed using the Statistical Packcage for Social Science.

Results: 82.4% of first-year students and 95.5% of last-year students answered that they knew what human papillomavirus is, claiming to be a sexually transmitted virus. Knowledge gaps were identified regarding the purpose of cytopathological examination, risk factors related to infection and related to the vaccine, such as number of doses and possible risks and benefits of it.

Conclusion: Although students demonstrated knowledge on human papillomavirus, its transmissibility and direct relationship with cervical cancer, they still presented important doubts that should be answered, regarding the purpose of the cytopathological examination, the risk factors for infection by the virus and in relation to the vaccine against the human papillomavirus.

Resumo

Objetivo: Avaliar o conhecimento entre acadêmicos de enfermagem sobre a vacina contra o papilomavírus humano e comparar os resultados obtidos entre estudantes do primeiro e do último ano de graduação.

Métodos: Estudo descritivo, transversal, quantitativo, realizado entre maio e junho de 2019. Aplicado questionário a 179 estudantes do curso de Enfermagem de uma universidade pública do estado de São Paulo, contendo dados sociodemográficos e outro sobre o conhecimento do papilomavírus humano e a vacina contra o mesmo. Dados foram analisados através do programa *Statistical Packcage for Social Science*.

Resultados: 82,4% dos estudantes do primeiro ano e 95,5% do último responderam que sabiam o que é o papilomavírus humano, e afirmaram ser um vírus sexualmente transmissível. Lacunas de conhecimento foram identificadas, quanto à finalidade do exame citopatológico, aos fatores de risco relacionados à infecção e relacionados à vacina, como número de doses e possíveis riscos e benefícios da mesma.

Conclusão: Apesar de os acadêmicos demonstrarem conhecimento quanto ao papilomavírus humano, sua transmissibilidade e relação direta com o câncer do colo do útero, ainda apresentaram dúvidas importantes que devem ser sanadas, quanto à finalidade do exame citopatológico, aos fatores de risco para infecção pelo vírus e em relação à vacina contra o papilomavírus humano.

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Resumen

Objetivo: Evaluar los conocimientos de académicos de enfermería sobre la vacuna contra el virus del papiloma humano y comparar los resultados obtenidos de estudiantes del primer y del último año de carrera.

Métodos: Estudio descriptivo, transversal, cuantitativo realizado entre mayo y junio de 2019. Cuestionario aplicado a 179 estudiantes de la carrera de Enfermería de una universidad pública del estado de São Paulo, que contenía datos sociodemográficos, y otro sobre conocimientos del virus del papiloma humano y su vacuna. Los datos fueron analizados a través del programa *Statistical Packcage for Social Science*.

Resultados: El 82,4 % de los estudiantes de primer año y el 95,5 % del último respondieron que sabían lo que es el virus del papiloma humano y afirmaron que es un virus sexualmente transmisible. Se identificaron vacíos de conocimiento respecto a la finalidad del estudio citológico, a los factores de riesgo relacionados con la infección y con la vacuna, como número de dosis y sus posibles riesgos y beneficios.

Conclusión: A pesar de que los académicos demostraron conocimientos respecto al virus del papiloma humano, su transmisión y relación directa con el cáncer de cuello uterino, también presentaron dudas importantes que deben ser aclaradas sobre la finalidad del estudio citológico, los factores de riesgo de la infección por el virus y sobre la vacuna contra el virus del papiloma humano.

Introduction

Cervical cancer (CC) kills 250,000 women annually worldwide, 85% of which are deaths in low- and middle-income countries, according to the World Health Organization's (WHO) International Agency for Research on Cancer (IARC).[1]

In Brazil, it is estimated that, from 2020 to 2022, there will be 16,590 new cases of CC, considered the fourth leading cause of death of women from cancer and the fourth most frequent tumor in the female population.[2]

This tumor develops from changes in the epithelium of the cervix (precursor lesions), often caused by human papillomavirus (HPV).[3.4] Among the hundreds of known HPV, genotypes 16 and 18 are considered high oncogenic risk, in addition to other associated factors such as early onset of sexual activity, immunosuppression, and multiparity.[5] Among the low-risk types, 6 and 11 are the most detected in acuminate condyloma lesions.[6]

Its main screening strategy is periodic performance of cytopathological examination, which shows results recognized by the Brazilian National Cancer Institute (INCA - *Instituto Nacional de Câncer*), identifying up to 90% of cases, even before the manifestation of symptoms, with a decrease in mortality by up to 50%.[7] Examination is recommended for women between 25 and 64 years old who have already started sexual activity, being recommended to perform it once a year; after two consecutive negative tests, every three years.[8]

Regarding disease prevention, a study in which 10 nurses working in Family Health Strategy (FHS) teams were interviewed found that health promotion and CC prevention occur through guidance, guidance, questioning, explanations, home visits, group formation, health education in the waiting room. Thus, educational actions on the theme favor examination appreciation by women, which interferes with the preventive examination coverage.[9]

Nurses are a key element in the fight against CC, and it is up to them to perform educational actions, consultations, request routine tests, guidance, home visits and guidance regarding the use of contraceptives.[10]

However, CC is still considered an important public health problem in developing countries, and it is recommended that they invest in HPV vaccination in children and adolescents.[1]

Since 2014, the Brazilian Ministry of Health (MoH) makes available through the Unified Health System (SUS – *Sistema Único de Saúde*), the quadrivalent HPV vaccine, which promotes protection against low- and high-risk genotypes. Currently, the target population for vaccination are girls aged 9 to 14 years and boys aged 11 to 14 years, both receiving two doses of the vaccine, with an interval of six months between them[11] and HIV carriers, from nine to 26 years old.[11]

Currently, the vaccine is the main form of CC prevention, and the goal of MoH is to vaccinate at least 80% of the target population to reduce the incidence of this cancer in the coming decades. Vaccination, together with cytopathological examination, is complemented as preventive actions.[12]

As the vaccine is still relatively new in the country, gaps were observed in literature on the subject, such as the investigation of the knowledge of academics from health courses the HPV vaccine

and related issues. Furthermore, the importance of nurses' actions in the fight against HPV and its complications stands out.

Considering the above, the study aimed to assess nursing students' knowledge on the HPV vaccine and to compare the results obtained among students in the first and last year of graduation. The purpose of the comparison was to identify whether those who have already had contact with content on CC prevention have greater knowledge on the HPV vaccine.

Methods

This is a descriptive, cross-sectional, quantitative methodological study, conducted with university students from the nursing course of a public Higher Education Institution (HEI) in the countryside of the state of São Paulo. Students of both sexes, aged 18 or over who were attending the first or the last year of bachelor's and teaching and bachelor's degrees in nursing in the year 2019 were included.

Convenience sampling was considered and data collection was taken between May and June 2019. The invitation was held in the classroom, with presentation of the research, in addition to clarifying doubts. Those who agreed to participate signed the Informed Consent Form and answered an instrument containing sociodemographic data and another on participants' knowledge on HPV and the vaccine against it. Thus, 179 nursing students from a public university in the state of São Paulo participated.

For data collection, a previously validated national instrument[13] was used, which contains data on participant identification and six domains, totaling 31 questions. The first domain addresses knowledge on HPV; the second, knowledge on the vaccine; the third addresses barriers to vaccination; the fourth, the acceptability of the vaccine; the fifth, personal history, directed to female participants; the sixth and last, to healthcare professionals.[13] For this research, the last two domains of the instrument were not used.

The collected data were tabulated by double typing and later validation, using Microsoft Excel 2010. The Statistical Packcage for Social Science (SPSS), version 25, was used. Data analysis was performed using descriptive statistics, using techniques that resulted in frequency tables for quantitative and qualitative variables.

The research followed the terms of Resolution 466/2012 and was authorized by the Institutional Review Board, under Opinion 3,178,962.

Results

Moreover, 179 regularly enrolled students were included, of which 62.0% had a bachelor's degree and 38.0% had a bachelor's degree and a teaching degree. Still, 50.8% were first-year students, and 49.2% were lasts.

Participants' age ranged between 18 and 38 years old, with a mean of 21.5 years (SD=2.96), 85.5% were female, 77.7% self-declared to be white, 95.5% were single and 43.0% were Catholics. Regarding income, 75.4% responded that they had an income of up to five minimum wages. The majority (58.1%) came from the state of São Paulo.

The first domain addresses knowledge on HPV and 82.4% of students in the first year and 95.5% in the last year both said they knew, and answered correctly that it is a virus (86.8% and 97.7%, respectively). They recognized HPV as a sexually transmitted infection (STI) and could develop CC (Table 1).

In question five, 33% of participants in the first year were unaware that HPV can cause changes in cytopathological examination. Doubts were also noted in the sixth question, in which 41.8% were unaware or unsure that HPV is a major cause of cancer in women. In the answers to question seven, there are doubts about tobacco use to increase the risk of CC among women, both among first and last year students (76.9% and 28.4%, respectively) (Table 1).

The second domain raised questions that explored knowledge on the HPV vaccine (Table 2). Doubts were observed among participants of the

Table 1. Frequency distribution of responses among students in the first (n=91) and last (n=88) periods regarding the first domain of the "Knowledge on HPV" questionnaire

Frequency distribution of responses among students	First year n(%)	Last year n(%)
1. Do you know what HPV is?		
Yes	75(82.4)	84(95.5)
I am not sure	16(17.6)	4(4.5)
Total	91(100)	88(100)
2. Is HPV a virus?		
Yes	79(86.8)	86(97.7)
No	2(2.2)	1(1.1)
I am not sure	10(11.0)	1(1.1)
Total	91(100.0)	88(100.0)
3. Is HPV a sexually transmitted infection?		
Yes	82(90.1)	84(95.5)
No	3(3.3)	1(1.1)
I am not sure	6(6.6)	3(3.4)
Total	91(100.0)	88(100.0)
4. Can HPV cause cervical cancer?		
Yes	83(91.2)	87(98.9)
No	-	1(1.1)
I am not sure	8(8.8)	-
Total	91(100.0)	88(100.0)
5. Can HPV cause changes in Pap smear (cervical cancer screening)?		
Yes	61(67.0)	81(92.0)
No	-	1(1.1)
I am not sure	30(33.0)	6(6.8)
Total	91(100.0)	88(100.0)
6. Is HPV a major cause of cancer in women?		
Yes	53(58.2)	81(92.0)
No	8(8.8)	6(6.8)
I am not sure	30(33.0)	1(1.1)
Total	91(100.0)	88(100.0)
7. Can smoking increase the risk of cervical cancer?		
Yes	21(23.1)	61(69.3)
No	11(12.1)	8(9.1)
I am not sure	59(64.8)	17(19.3)
Total	91(100.0)	86(97.7)

first and last year, when asked about the application of the vaccine in sexually active people (41.8% and 31.9%, respectively). Also noteworthy is their uncertainty regarding the number of doses of the vaccine (84.7% and 78.4%, respectively). Regarding the vaccine to reduce the chances of developing acuminate condyloma, 44% of first-year students and 42.1% of last-year students did not know how to respond correctly (Table 2).

The third domain sought to identify the barriers to vaccination, which deserves to be highlighted, since 100.0% of participants, from both periods, reported knowing the need to use condoms and identified the importance of having a cytopathological examination, even after vaccination. However,

Table 2. Frequency distribution of responses among students from the first and last periods regarding the second domain of the "Knowledge on the HPV vaccine" questionnaire

Frequency distribution of responses among students	First year n(%)	Last year n(%)
1. Does the HPV vaccine prevent cervical cancer?		
Yes	65(71.4)	70(79.3)
No	10(11.0)	14(15.9)
I am not sure	15(16.5)	4(4.5)
Total	90(98.8)	88(100.0)
2. Should the HPV vaccine be applied before the first sexual intercourse?		
Yes	57(62.6)	71(80.7)
No	12(13.2)	9(10.2)
I am not sure	22(24.2)	8(9.1)
Total	91(100.0)	88(100.0)
3. Can the HPV vaccine be applied to anyone who has had sex?		
Yes	53(58.2)	60(68.2)
No	9(9.9)	10(11.4)
I am not sure	29(31.9)	18(20.5)
Total	91(100.0)	88(100.0)
4. Can the HPV vaccine be harmful to health?		
Yes	1(1.1)	2(2.3)
No	75(82.4)	81(92.0)
I am not sure	15(16.5)	5(5.7)
Total	91(100.0)	88(100.0)
5. Can the HPV vaccine cause HPV infection?		
Yes	3(3.3)	5(5.7)
No	67(73.6)	71(80.7)
I am not sure	21(23.1)	12(13.6)
Total	91(100.0)	88(100.0)
6. Is the HPV vaccine provided by the Government?		
Yes	83(91.2)	88(100.0)
No	4(4.4)	-
I am not sure	4(4.4)	-
Total	91(100.0)	88(100.0)
7. Is the HPV vaccine part of the girls' vaccination card?		
Yes	57(62.6)	77(87.5)
No	10(11.0)	3(3.4)
I am not sure	24(26.4)	8(9.1)
Total	91(100.0)	88(100.0)
15.1. Did you hear about the HPV vaccine at school?		
Yes	41(45.1)	49(55.7)
No	49(53.8)	39(44.3)
Total	90(98.9)	88(100.0)
15.2. Heard about the HPV vaccine from friends		
Yes	7(7.7)	11(12.5)
No	83(91.2)	77(87.5)
Total	90(98.9)	88(100.0)
15.3. Heard about the vaccine on TV/radio		
Yes	16(17.6)	21(23.9)
No	74(81.3)	67(76.1)
Total	90(98.9)	88(100.0)
15.4. Hear about the HPV vaccine online		
Yes	11(12.1)	32(36.4)
No	79(86.8)	56(63.6)
Total	90(98.9)	88(100.0)
15.5. Heard about the HPV vaccine from a healthcare professional		
Yes	31(34.1)	41(46.6)
No	59(64.8)	47(53.4)
Total	90(98.9)	88(100.0)

Continue...

Continuation.

Frequency distribution of responses among students	First year n(%)	Last year n(%)
15.6. Heard about the HPV vaccine by other means		
Yes	6(6.6)	9(10.2)
No	84(92.3)	79(89.8)
Total	90(98.9)	88(100.0)
16. Are 3 doses necessary for complete vaccination?		
Yes	38(41.8)	42(47.7)
No	14(15.4)	19(21.6)
I am not sure	39(42.9)	27(30.7)
Total	91(100.0)	88(100.0)
17. Does the HPV vaccine decrease the chance of having genital warts?		
Yes	51(56.0)	51(58.0)
No	4(4.4)	16(18.2)
I am not sure	36(39.6)	21(23.9)
Total	91(100.0)	88(100.0)

29.6% of first-year students and 33% of last-year students were unable to answer the benefits of the vaccine on cytological changes (Table 3).

The fourth domain, on the other hand, contemplated the vaccine's acceptability among participants (Table 3), and the majority of students from the periods surveyed recommended vaccination. Despite this, 41.8% of first-year students and 84.1% of last-year students say they have not been vaccinated.

Table 3. Frequency distribution of responses among students of the first and last periods regarding the fourth domain of the "HPV vaccine acceptability" questionnaire

Frequency distribution of responses among students	First year n(%)	Last year n(%)
22. Do you know anyone who has ever had the HPV vaccine?		
Yes	77(84.6)	64(72.7)
No	12(13.2)	21(23.9)
I am not sure	2(2.2)	3(3.4)
Total	91(100.0)	88(100.0)
23. Have you ever had the HPV vaccine?		
No	38(41.8)	74(84.1)
Yes/public network	39(42.9)	7(8.0)
Yes/private	4(4.4)	5(5.7)
Yes/I am not sure	9(9.9)	2(2.3)
Total	90(98.9)	88(100.0)
24. Would you recommend the HPV vaccine for your child, friend or relative to take?		
Yes	89(97.8)	88(100.0)
I am not sure	1(1.1)	-
Total	90(98.9)	88(100.0)

Discussion

HPV vaccination has been widely discussed in the world and, currently in Brazil, since its introduction to the Brazilian National Vaccination Calendar (CNV - *Calendário Nacional de Vacinação*).

Moreover, other data obtained from the sociodemographic profile corroborate those from other studies of the same theme, such as the predominance of single and young participants, the importance of the profile studied also stands out, as it is related to the cases of CC secondary to HPV infection.[14-17]

As for knowledge on HPV, both first year and last year students obtained satisfactory results for the first questions and the data corroborate those of the research carried out with medical students in Goiás, in which 98-99.4% of participants stated have heard about HPV and recognize it as an STI.[18] This is an important result, as it may have alerted them, even if discreetly, to a health risk posed by HPV.

Although the first results were satisfactory, the question "Can HPV cause changes in the Pap smear?" generated doubts, especially among first-year students, which is not consistent with the answers obtained in the previous question "Can HPV cause cervical cancer?", when most of these students answered affirmatively. The comparison between the answers to these questions may suggest that first-year students may not yet know the purpose of cytopathological examination. Given that, it differs from a study carried out with nursing students in Paraíba, revealing that 100.0% of participants stated that cytopathological examination is efficient both for early detection of CC and for vulvovaginitis diagnosis.[17]

When asked if CC is a major cause of cancer in women, there were also doubts among first-year students, reinforcing the need to fill knowledge gaps among students regarding HPV and CC, since it affects a large percentage of women students in the country.[19]

Regarding the relationship between smoking and the risks of developing CC, doubts were observed among first-year students, suggesting a lack of knowledge on the risk factors that predispose to CC. The relationship between smoking and HPV infection is explained by the local immunosuppression caused by smoking that allows the virus to penetrate cells more easily.[20]

Regarding the question "Can the HPV vaccine be applied to people who have already had sexual intercourse?", there was a smaller number of correct answers between the two periods. In a survey of adolescents in Acre, most participants were unaware that the vaccine could be applied to people who have already started sex.[21] After the beginning of sexual activity, the risk of contact with HPV may progressively increase. About 25% of adolescents had HPV in the first year of the beginning of sexual activity, with an increase in the percentage in up to 70% three years later.[22] To date, there is no evidence that vaccination is a significant benefit to women previously exposed to the virus, i.e., some may benefit and others may not. It is noteworthy that the vaccine does not present risks if an individual has had previous contact with the virus.[22]

As for the way they got to know the vaccine, there was an agreement among students from both periods, with the school and healthcare professionals being more cited. Thus, the importance of nurses is emphasized, professionals trained to work in the health education process in schools, because according to the Health at School Program (*Programa Saúde na Escola*), created in 2007 by the Ministry of Health and the Ministry of Education, through Presidential Decree 6,286, the school is a space that favors health promotion practices, information and guidelines relevant to available health services.[23,24] This finding corroborates those of another study, in which the majority of participants indicated nurses and schools as the main vehicles of information about the vaccine, and it can be said that it is essential that nurses are trained to guide the population properly.[21]

The question about the number of vaccine doses also generated many doubts among students, a difficulty corroborated by a study carried out in a HEI in São Paulo with nursing students, in which only 40% of respondents answered correctly to the number of doses, and a number even smaller (15.0%) was able to tell the interval between them.[16] Currently, for both girls and boys, the vaccine must be applied in two injectable doses, the second being six months after the first.[11]

All students from the studied periods stated that it is necessary to use a condom after vaccination, coinciding with the other results, when 99.0% of participants also indicated this need.[16] Thus, it is possible to state that students understand the use of condoms as a synonym for protection against STIs; however, resistance to use can be observed in some studies that point to a gap between knowledge and the use of condoms among young people, in addition to a series of justifications for avoiding use such as discomfort and decreased sensitivity.[15,25-27]

Vaccination does not exclude preventive actions and early detection by screening, which seeks precursor lesions and cancer in asymptomatic women.[8] Most of students agree with this statement, as well as those from research carried out with medical students, in which 91% of participants agreed that even if vaccinated, it is necessary for women to undergo cytopathological examination.[18]

Regarding vaccine acceptability, most participants responded affirmatively. The same question was asked in another study of healthcare professionals with 81.5% of statements.[13] However, even though students recommend the vaccine, adherence to it is lower than the number of people who recommend it, as 41.8% of first-year students and 84.1% of last-year students reported not having been vaccinated. Barriers to acceptance can be related to fear of pain, fear of family disapproval, misinformation and taboos, such as thinking that vaccination will stimulate early sexual activity.[21] The myths related to HPV can generate an overvaluation of the vaccine, affecting the perception of HPV and CC significance.[28]

Students from a single public HEI in nursing were surveyed. It is suggested that new studies address students from other institutions, including private schools, expanding the results, including comparatives.

Conclusion

The results found and discussed revealed that, although academics have demonstrated knowledge on HPV, its transmissibility and direct relationship with CC, several knowledge gaps have been identified, such as the purpose of cytopathological ex-

amination, risk factors for HPV infection and vaccine issues, number of doses, risks and benefits. As nursing is a health course, it is expected that these students, as future nurses, acquire and disseminate knowledge on HPV vaccination and about the disease, as they must be able to work, in their work environments, with education in health on HPV.

Collaborations

Panobianco MS guided and worked on the conception, research, methodology, final writing and approval of the version to be published. Bezerril AV worked on design, research, methodology and the final writing; Nunes LC worked on the final writing and critical review. Gozzo TO worked on the critical review and final writing. Other authors worked on the final writing and critical review.

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