

Assessment of knowledge about human papillomavirus among nursing college students

Avaliação do conhecimento sobre papilomavírus humano entre estudantes universitários de enfermagem
Evaluación del conocimiento sobre virus del papiloma humano en estudiantes universitarios de enfermería

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Abstract

Objective: To assess undergraduate nursing students' knowledge about the human papillomavirus.

Methods: Descriptive, cross-sectional, quantitative study. A total of 264 undergraduate nursing students from a higher education institution in the interior of the state of São Paulo participated in the study. Data collection was conducted between August and December 2022 with the use of two instruments: a sociodemographic and lifestyle questionnaire, and a questionnaire measuring knowledge of the human papillomavirus. Descriptive statistical analysis was performed, and appropriate statistical tests were applied, adopting a significance level of 5% ($p=0.05$).

Results: Gaps in knowledge about the virus have been found, including factors on symptoms, transmission, treatment, and vaccination. Students in their final years who had already taken the women's health course covering aspects of the human papillomavirus obtained a higher average of correct answers, reaching 76.1%. However, the overall average was 60.8%.

Conclusion: Students in the last years performed reasonably well on the HPV knowledge questionnaire. A gradual inclusion of all aspects and information about the human papillomavirus in Higher Education Institutions is suggested, starting in the first years of the courses in an interdisciplinary manner, addressing its implications for health, incidence, aggravating factors, population data and complexities in an integrated manner. These topics can be explored later in detail, in a more comprehensive and in-depth manner, covering aspects such as symptoms, prevention, diagnosis and treatments.

Resumo

Objetivo: Avaliar o conhecimento de estudantes universitários de enfermagem sobre o papilomavírus humano.

Métodos: Estudo descritivo, transversal, quantitativo. Participaram 264 estudantes dos Cursos de Graduação em Enfermagem de uma Instituição de Ensino Superior do interior do estado de São Paulo. Realizada entre agosto e dezembro de 2022, a coleta de dados contou com dois instrumentos, sendo um questionário sociodemográfico e de hábitos de vida e o outro um questionário de medida de conhecimento do papilomavírus humano. Foi feita análise estatística descritiva, e foram aplicados testes estatísticos apropriados, sendo adotado nível de significância de 5% ($p=0,05$).

Resultados: Houve lacunas no conhecimento sobre o vírus, incluindo fatores sobre sintomas, transmissão, tratamento e vacinação. Alunos dos últimos anos e que já tinham cursado a disciplina de saúde da mulher, que abordou aspectos sobre o papilomavírus humano, obtiveram maior média de acertos, atingindo 76,1%. Entretanto, a média geral foi de 60,8%.

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Conflicts of interest: none to declare.

Conclusão: Os alunos dos últimos anos tiveram desempenho razoável no questionário de conhecimento do HPV. Sugere-se ocorrer uma inclusão gradual de todos os aspectos e informações sobre o papilomavírus humano nas Instituições de Ensino Superior, desde os primeiros anos dos cursos, de maneira interdisciplinar, abordando suas implicações para a saúde, incidências, agravantes, dados populacionais e complexidades de forma integrada. Posteriormente, de forma mais abrangente e aprofundada, esses temas podem ser explorados em detalhes, contemplando aspectos como sintomas, prevenção, diagnóstico e tratamentos.

Resumen

Objetivo: Evaluar el conocimiento de estudiantes universitarios de enfermería sobre el virus del papiloma humano.

Métodos: Estudio descriptivo, transversal, cuantitativo. Participaron 264 estudiantes de la carrera de enfermería de una institución de educación superior del interior del estado de São Paulo. Realizada entre agosto y diciembre de 2022, la recopilación de datos contó con dos instrumentos: un cuestionario sociodemográfico y de hábitos de vida y un cuestionario de medida de conocimiento del virus del papiloma humano. Se realizó análisis estadístico descriptivo y se aplicaron pruebas estadísticas adecuadas, con un nivel de significación de 5 % ($p=0,05$).

Resultados: Hubo vacíos de conocimiento sobre el virus, que incluyeron factores sobre síntomas, transmisión, tratamiento y vacunación. Los alumnos de los últimos años y que ya habían cursado la materia de salud de la mujer, que aborda aspectos sobre el virus del papiloma humano, obtuvieron un mayor promedio de aciertos, con un 76,1 %. Sin embargo, el promedio general fue de 60,8 %.

Conclusión: Los alumnos de los últimos años tuvieron un resultado razonable en el cuestionario de conocimiento sobre el HPV. Se sugiere incluir gradualmente todos los aspectos e información sobre el virus del papiloma humano en las instituciones de educación superior, desde los primeros años de la carrera, de manera interdisciplinaria, que aborde las consecuencias para la salud, incidencias, agravantes, datos poblacionales y complejidades de forma integrada. Posteriormente, estos temas pueden ser estudiados con más detalles, de forma más amplia y profunda, contemplando aspectos como síntomas, prevención, diagnóstico y tratamientos.

Introduction

Human papillomavirus (HPV) is a highly prevalent sexually transmitted virus, classified as a Sexually Transmitted Infection (STI) that affects the skin and mucous membranes. It presents as visible/clinical lesions or subclinical lesions, with no apparent symptoms.⁽¹⁾ HPV is more common in young people, after the onset of sexual activity and can remain latent for months or years.^(1,2)

Approximately one third of men over the age of 15 years carry at least one type of genital HPV, and one in five may be infected with one or more types considered as high-risk or oncogenic.⁽³⁾ In the case of female cervical cancer, there were more than 600 thousand new cases globally in 2020, causing more than 300 thousand deaths.⁽⁴⁾ Between 2023 and 2025, 17 thousand new cases are estimated annually in Brazil, with an incidence of 13.25 cases per 100 thousand women.⁽⁵⁾ This reflects a serious public health problem related to the persistence of infections by HPV types 16 and 18, responsible for approximately 70% of uterine cancers.⁽⁵⁾

Regarding the severity of the virus, immunization is essential, as it is directly linked to precursor lesions of cancer. Since 2014, the vaccine is offered by the Unified Health System (SUS) to boys and girls aged 9-14 years in a double dose regimen at six month-intervals. Cancer patients and transplant

recipients are also eligible. The Brazilian Ministry of Health highlights the importance of the vaccine for preventing cervical cancer, aiming to vaccinate 80% of the target population, thereby reducing the incidence of this cancer.⁽⁶⁾ Vaccination for men can prevent approximately 80.3% of HPV subtypes associated with penile cancer.⁽⁷⁾

Although the vaccine is effective, screening for the disease is crucial to prevent its complications. The cytopathological test, known as Pap smear, is recommended by the Ministry of Health for screening for precursor lesions in sexually active women aged between 25 and 64 years.⁽⁸⁾ Vaccinated women should undergo the test, as the vaccine does not protect against all oncogenic types of HPV.⁽⁹⁾

The HPV DNA test is important for viral screening, as it is more sensitive than the Pap smear. Recognized by the World Health Organization (WHO) since 2014, the HPV DNA test is more effective in detection, which reduces false-negative rates.⁽¹⁰⁾ In Brazil, a study conducted in a city in São Paulo proved that the test is more cost-effective in the early detection of cervical cancer cases.⁽¹¹⁾ However, national implementation still requires reorganization of health practices, adjusting the population served and testing intervals.⁽¹²⁾

Access to the Pap smear through the SUS also faces challenges, with coverage below 80% and scheduling challenges.⁽¹³⁾ In developed countries,

adherence to this test has also declined, and this fact has been attributed to limited clinic hours and the unavailability of health professionals.⁽¹⁴⁾

Considering the interventions in Primary Health Care, the importance of actions of nurses, who lead the development of protocols, referrals and assistance, is highlighted.⁽¹⁵⁾ In the approach to HPV, these professionals perform educational, prevention and diagnostic actions, as well as consultations on sexual and women's health.⁽¹⁶⁾

However, studies point to gaps in knowledge about HPV among undergraduate students in health courses in Brazil, as well as in other developed and developing countries. The lack of information ranges from symptoms to vaccination, generating concerns about the role of these future professionals in preventing STIs.^(17,18)

Considering infection and reinfection by the HPV and that nurses are key elements in the fight against STIs, proper knowledge about diseases caused by HPV and their complications is part of undergraduate students' responsibility to successfully provide guidance on future sexual habits. Therefore, the aim of the present study was to evaluate the knowledge of university nursing students about HPV. The research on knowledge gaps on the subject aims to bring about positive changes in teaching and contribute to the understanding of students' educational needs.

Methods

This is a descriptive, cross-sectional, quantitative study conducted at a Higher Education Institution in the interior of the state of São Paulo, where two Undergraduate Nursing Courses are offered, namely a Bachelor's Degree and a Bachelor and Teaching Degree. The inclusion criteria were being enrolled in one of the courses and aged ≥ 18 years old.

A sociodemographic and lifestyle questionnaire reviewed by two health professionals with expertise in the area was used for the characterization of participants. An adapted HPV knowledge measurement questionnaire was used to assess participants' knowledge about HPV. It contains 29 true or false

questions, divided into three parts: the first on general knowledge about HPV, the second on aspects of the HPV test, and the third on knowledge about vaccination against the virus.⁽¹⁹⁾

Data collection was carried out by one of the researchers between August and December 2022 with 264 students, 156 of whom were enrolled in the Bachelor's degree program and 108 in the Bachelor and Teaching degree program. Invitations were sent prior to classes. The average participation time was of 25 minutes. The survey was conducted only once per class to avoid duplication. The questionnaires were completed and delivered in sealed envelopes by the students.

Data were entered into Microsoft Excel 2016 spreadsheets by double typing. Descriptive statistical analysis was used, employing mean, median, standard deviation, minimum and maximum for quantitative variables, and percentage frequency for variables in general. Comparatively, the Fisher's exact test and the Kruskal-Wallis test were used for different groups and variables. The significance level adopted was 5% ($p=0.05$). The research project was approved by the Research Ethics Committee of the selected Higher Education Institution (5.513.273) and received the Research Protocol with CAAE Registration Number 60076722.0.0000.5393.

Results

A total of 232 (87.9%) women and 31 (11.7%) men participated in the study. The mean age was 21.8 years, ranging from 18 to 49 years, with a standard deviation of 4. Most participants identified themselves as white (69.7%), single (95.5%) and with a family income of up to five minimum wages (70.0%). Regarding religion, 45.1% were Catholic, 18.5% practiced other religions and 25% had no religion. Regarding lifestyle habits, most (90.9%) declared being non-smokers, 7.6% indicated being smokers and 1.5% did not respond. Regarding alcohol consumption, 40.5% reported monthly consumption and 31.1% weekly consumption in all years of the course, and 18.9% of participants reported not consuming alcohol. The correct answers

Table 1. Correct answers distributed among undergraduate nursing students by item in the questionnaire measuring knowledge of the human papillomavirus

Question	1 st year*	2 nd year*	3 rd year*	4 th year*	5 th year‡	p-value†
1. Can HPV cause cervical cancer?	93.0	91.7	98.0	97.8	100.0	0.475
2. Can a person have HPV for many years without knowing?	84.9	95.0	98.0	97.8	100.0	0.019
3. Does having many sexual partners increase the risk of contracting HPV?	80.0	80.0	85.4	89.1	92.9	0.808
4. Is HPV very rare?	92.9	93.3	91.8	95.7	100.0	0.986
5. Can HPV be transmitted through sexual intercourse?	90.5	94.9	95.9	97.8	100.0	0.673
6. Does HPV always have signs or symptoms?	68.6	82.8	75.0	87.0	92.9	0.019
7. Does using a condom (male or female condom) reduce the risk of contracting HPV?	95.3	96.6	95.9	97.8	100.0	0.976
8. Can HPV cause HIV/AIDS?	52.3	64.9	75.5	80.4	76.9	<0.001
9. Can HPV be transmitted through direct contact with the skin of the genitals?	51.8	48.3	61.2	63.0	83.3	0.297
10. Do men not contract HPV?	94.1	85.0	95.8	91.3	100.0	0.560
11. Does having sex at an early age increase the risk of contracting HPV?	35.7	28.3	26.5	84.1	78.6	<0.001
12. Are there many types of HPV?	55.3	45.0	63.3	80.4	71.4	<0.001
13. Can HPV cause genital warts?	80.0	76.7	87.8	84.8	85.7	0.685
14. Can HPV be cured with antibiotics?	57.0	42.4	60.4	66.7	64.3	0.079
15. Will most sexually active people contract HPV at some point in their lives?	7.0	8.5	14.3	33.3	71.4	<0.001
16. Is HPV treatment usually not necessary?	0.0	3.3	10.2	15.2	35.7	<0.001
17. If a woman tests positive for HPV, will she have cervical cancer for sure?	87.4	88.7	96.2	93.6	100.0	0.478
18. Can samples for HPV and Pap tests be collected at the same time?	44.8	48.4	61.5	63.0	78.6	0.072
19. Can the HPV test detect how long ago you had an HPV infection?	13.8	11.3	17.3	31.9	42.9	0.070
20. Can the HPV test detect if you need to get vaccinated against HPV?	70.2	67.7	78.0	80.0	64.3	0.416
21. When you take an HPV test, do you get the results on the same day?	10.3	8.1	17.6	28.3	35.7	<0.001
22. If a woman tests negative for HPV, do the results come out the same day?	25.3	25.8	21.2	42.6	35.7	0.254
23. Are girls vaccinated against HPV not required to have a Pap smear when they are older?	95.4	100.0	96.2	97.9	92.9	0.412
24. Does one of the HPV vaccines protect against genital warts?	36.0	30.6	34.6	40.4	42.9	0.009
25. Do HPV vaccines protect against all sexually transmitted diseases?	94.2	83.6	98.0	100.0	100.0	0.039
26. Can someone who has been vaccinated against HPV not develop cervical cancer?	88.5	82.3	86.3	95.7	92.9	0.099
27. Do HPV vaccines protect against most cervical cancers?	47.1	51.6	51.9	57.4	64.3	0.036
28. Should the HPV vaccine be given in three doses?	4.6	11.3	30.8	30.4	50.0	<0.001
29. Are HPV vaccines more effective if they are given to people who have never had sexual intercourse?	34.9	21.0	34.6	63.8	71.4	<0.001

*Refers to both the classes of the Bachelor's Degree and the Bachelor and Teaching Degree courses; †value refers to the difference compared with the groups of the variable 'years' (Fisher's exact test); ‡refers to the Bachelor and Teaching Degree class. Results expressed as %; HPV - human papillomavirus

in the three blocks of the questionnaire across the five years of graduation were compared. According to the Kruskal-Wallis test, there was statistical significance ($p < 0.001$) in the overall comparison between the years for the 29 items of the questionnaire, and the number of correct answers increased from the third year onwards. Regarding knowledge of HPV, there was a significant difference between the years of the course in 14 items (2, 6, 8, 11, 12, 15, 16, 21, 24, 25, 27, 28 and 29), with $p < 0.05$ in each case (Table 1). Unanswered items were excluded from the analysis.

The average number of correct answers to the HPV knowledge questionnaire varied between years: the fifth year of the course had the highest average (76.1%), while the second year had the lowest (55.0%). Furthermore, 20.2% of the students chose the answer "I don't know" (Table 2). Although comparing the knowledge among students of the course was not the objective, note that students in the last year demonstrated greater familiarity with the topic.

Table 2. Answers presented by year in the questionnaire measuring knowledge of the human papillomavirus

Year	Average number of correct answers	Average number of incorrect answers	Average number of "I don't know" answers
1*	16.5 (56.8)	5.6(19.4)	6.9 (23.8)
2*	16.0 (55.0)	5.9(20.3)	7.2 (24.7)
3*	17.8 (61.4)	5.8 (19.8)	5.4 (18.8)
4*	20.5 (70.6)	4.8 (16.7)	3.7 (12.8)
5†	22.1 (76.1)	4.6 (16.0)	2.3 (7.9)
Total	17.6 (60.8)	5.5 (19.0)	5.9 (20.2)

Results expressed as %; *Refers to both the classes of the Bachelor's Degree and the Bachelor and Teaching Degree courses; †year of the Bachelor and Teaching Degree course

Discussion

The profile of participants was similar to that of undergraduate health students from other studies, with a predominance of the female sex, single marital status, and age range between 20 and 24 years.^(20,21) Regarding habits, most (90.9%) did not report smoking, 40.5% reported monthly alcohol consumption, and 31.1% weekly consumption. The excessive con-

sumption of alcohol by a significant portion of health students, especially by women, is reported in the literature and smoking is also observed in considerable proportions,⁽²⁰⁾ although less reported in this group.

The average number of correct answers to the instrument measuring knowledge of HPV was 60.8%. Students in the health field generally have little knowledge about HPV and this knowledge improves throughout the course.^(17,22) In the initial block (16 items), a high rate of correct answers (95%) was presented in the statement about the relationship between HPV and cervical cancer, although other studies indicate that university students have less knowledge about the consequences of HPV, especially in relation to cervical cancer.⁽²³⁾

Regarding HPV prevention through condom use, 96.5% answered correctly. Still, it is important to educate young people and adults about the risks of HPV both for cancers and for serious and difficult-to-control infections, and about the significance of condom use. Although university students present a higher rate of condom use in the first sexual encounter, this behavior decreases over time. Stable relationships tend to have lower levels of use, and young people often have a low perception of the risks of STIs.⁽²⁴⁾

Considering the relationship between HPV and HIV, students in the last years demonstrated greater knowledge compared to students in the first years. Although studies show that 73% of students associate cervical cancer with HPV,⁽²⁵⁾ knowledge was weak in this study. The average number of correct answers related to the topic was 66.1%, confirming the need for further study on the learning process.

The issue on the probability of contracting HPV at some point in life also generated misunderstandings, as 60.5% of students answered incorrectly. Data from the National Cancer Institute (INCA) from 2023 indicate that approximately 80% of sexually active women may contract HPV at some point, and numbers are even higher in men.⁽⁶⁾ Data in the literature suggest that the university population may have little information about the incidence of the virus given their low level of knowledge about HPV transmission.⁽²⁴⁾

The results of this study showed that most participants do not know about the need for treatment

of the virus, reinforcing limitations in the understanding of HPV treatment. Note that most HPV infections are asymptomatic, transient and do not require specific treatment to eliminate the virus, but individualized treatments for each lesion.⁽¹⁾ This mistaken perception of students reflects not only flaws in the learning process on the subject, but may also influence inadequate practices and recommendations made by these future professionals.

As for the second block of the HPV questionnaire, related to the test to detect HPV, the average number of correct answers increased as the year of graduation progressed. Although the test is more economical and efficient than cytology, its dissemination is limited, mainly because of its unavailability in the SUS. This knowledge gap is also shared by professionals and students in the health field, as indicated in the literature.⁽²⁶⁾

Participants had difficulty in answering if the HPV test can indicate the duration of infection by the virus. The correct answer, "false", reflects that the test detects different types of HPV, including high-risk types, but does not determine the duration of infection.⁽¹²⁾ The absence of the test in the SUS influences the knowledge of health students, and knowledge on the subject is insufficient in undergraduate courses, as well as among the general population.

Students demonstrated satisfactory knowledge by denying that a positive result on the HPV test suggests cervical cancer and understanding that the test is not used to indicate vaccination against HPV. However, a more solid knowledge about the HPV test during training is necessary.

The last section of the questionnaire measuring knowledge about HPV consists of seven items and focuses on immunization against the virus. In this questionnaire, fifth-year students once again had the highest average number of correct answers, while second-year students had the lowest.

In general, students performed well on some questions about immunization against the virus. Items relating the vaccine to the Pap smear test, other STIs, and the development of cervical cancer had more than 88% of correct answers, indicating broad knowledge about vaccination and related topics.

However, weaknesses were observed in some responses. For example, the relationship between vaccine protection and genital warts: 41.4% of participants indicated the answer “I don't know”, while 23.0% were unable to relate the action of the vaccine with protection against genital warts. Three vaccines against the virus are currently approved in Brazil, and two of them protect against high and low risk types of HPV, that is, those linked to genital warts.⁽¹⁾

Only 51.9% of students correctly stated that vaccines protect against most cervical cancers, showing gaps in the understanding of HPV vaccination coverage. A similar situation was observed in the question about the number of doses of the vaccine, when only 18.4% gave the correct answer by indicating as “false” that the correct answer is three doses. This confusion may be related to the updated schedule, as the vaccine has been administered in two doses since 2016, with exceptions only for some specific groups.⁽¹⁾

Participants demonstrated low knowledge (38.7%) about the efficacy of HPV vaccines when administered to individuals with no history of sexual intercourse. The current vaccination program in the SUS covers children aged 9-14 years aiming to offer protection in the absence of sexual activity, highlighting the importance of early immunization.⁽²⁷⁾ This knowledge gap deserves attention, as it may affect the professional practice of future nurses, who are responsible for providing guidance on prevention and immunization against HPV.

The results highlight gaps in nursing students' knowledge about HPV and its preventive measures. This shows the need to review and update content from the early stages of training. Training professionals who are capable of educating patients about HPV and preventing related cancer is essential for public health and reflects the quality of nursing services. Recognizing deficiencies in the teaching process is crucial to guide the actions of future nursing professionals.

Conclusion

Students from the last years performed reasonably well on the HPV knowledge questionnaire, but did

not achieve an average score above 70% on specific questions, especially on treatment, virus identification tests and vaccination. These gaps highlight the need to improve educational programs in nursing and implement more effective strategies to address deficiencies in HPV knowledge. Thus, the gradual inclusion of all aspects and information on HPV and STIs from the first years of the courses in an interdisciplinary manner is desirable, addressing its implications for health, incidence, aggravating factors, epidemiological data and complexities in a coordinated manner. More broadly, exploring and detailing lead to important revisions in teaching, which cover aspects of prevention, symptoms, diagnosis and treatments, increasing awareness of the dangers of HPV. This will not only have an educational role, but will also reinforce the importance of HPV as a public health issue.

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Collaborations

Sena BTS, Borges ML, Pardo GRS and Panobianco MS contributed to the study design, data analysis and interpretation, writing of the article, relevant critical review of the intellectual content and approval of the final version to be published.

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