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SCIENTIFIC KNOWLEDGE OF FEMALE UNDERGRADUATE STUDENTS AT A HIGHER EDUCATION INSTITUTION IN THE EXTREME SOUTH OF BAHIA REGARDING HPV AND CERVICAL CANCER

Conhecimento científico discente do sexo feminino de uma instituição de ensino superior no extremo Sul da Bahia sobre HPV e câncer de colo do útero

Conocimiento Científico de Estudiantes Universitarias de una Institución de Educación Superior del Extremo Sur de Bahía sobre el VPH y el Cáncer de Cuello Uterino

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ABSTRACT

Human Papillomavirus (HPV) is a vector of sexually transmitted infection (STI) which, when integrated into the DNA of a healthy cell, alters its ribonucleic composition, producing oncogenic-level changes and leading to the development of cervical neoplasia. This study aimed to analyze the knowledge of female undergraduate students from a higher education institution in the Extreme South of Bahia regarding cervical neoplasia and Human Papillomavirus (HPV). A field study with mixed descriptive analysis was conducted using an online questionnaire, followed by parametric statistical analysis using the arithmetic mean. The study complied with sanitary protocols and respected Resolution 466/2012 and Circular Letter No. 02/2021, which authorize online research. The sample size consisted of 51 students. The arithmetic mean (AM) age of the participants was 23.28 years. The health sciences area represented the largest proportion of participants; being single and having an income of one to four minimum wages accounted for 75.5%. Approximately 95.30% of the students reported knowledge about HPV, and 88% were aware of the Papanicolaou test. Among the total participants, only one case (5.9%) reported no knowledge of a history of cervical neoplasia. Given the direct correlation between HPV and cervical cancer, there is a need to address this topic in the academic environment, prioritizing preventive methods such as condom use and performance of the Papanicolaou test, in order to promote scientific discussion.

Keywords*: Undergraduate Students; Female Sex; Human Papillomavirus; Cervical Cancer.*

RESUMO

Papiloma Humano (HPV), é vetor de infecção sexualmente transmissível (IST), quando se integra ao DNA de uma célula saudável e altera sua composição ribonucleica, produz alterações a níveis oncogênicos, desenvolvendo neoplasia cervical. Buscou-se estabelecer uma análise do conhecimento das discentes de uma instituição de ensino superior no Extremo Sul da Bahia, sobre neoplasia cervical e o Papilomavírus humano (HPV). Realizou um estudo de campo com análise descritiva mista, usando aplicação de questionário online, realizando uma análise estatística paramétrica com média aritmética. Seguindo os protocolos sanitários, respeitando a legislação 466/2012 e Carta Circular 02/2021 autorizando pesquisas online. O n amostral foi de 51 discentes. A média aritmética (Ma) das idades das discentes foi 23,28 anos, sendo a área de saúde a maior representatividade entre as discentes, ser solteira e receber de 1 a 4 salários-mínimos somam (75,5%), cerca de 95,30% das discentes responderam que conheciam o HPV e 88% conheciam o exame Papanicolaou, e do total das discentes apenas um caso (5,9%) desconhecem histórico de neoplasia cervical. Por haver uma correlação direta entre HPV e Câncer cervical, há uma necessidade de se abordar a temática em ambiente acadêmico, priorizando os métodos de prevenção como uso da camisinha e realização do Papanicolaou, buscando explorar a discussão cientifica.

Palavras-chave: Discentes; Sexo Feminino; Papilomavírus Humano; Câncer de Colo do Útero.

RESUMEN

El Virus del Papiloma Humano (VPH) es un vector de infección de transmisión sexual (ITS) que, al integrarse en el ADN de una célula sana, altera su composición ribonucleica, produciendo cambios a nivel oncogénico y desarrollando neoplasia cervical. El objetivo fue analizar el conocimiento de

estudiantes universitarias de una institución de educación superior del Extremo Sur de Bahía sobre la neoplasia cervical y el Virus del Papiloma Humano (VPH). Se realizó un estudio de campo con análisis descriptivo mixto mediante la aplicación de un cuestionario en línea, con análisis estadístico paramétrico utilizando la media aritmética. Se respetaron los protocolos sanitarios y la legislación vigente, conforme a la Resolución 466/2012 y la Carta Circular 02/2021, que autorizan investigaciones en línea. El tamaño muestral fue de 51 estudiantes. La media aritmética de edad fue de 23,28 años. El área de la salud presentó la mayor representatividad; ser soltera y tener ingresos de uno a cuatro salarios mínimos correspondieron al 75,5%. Aproximadamente el 95,30% de las estudiantes manifestó conocer el VPH y el 88% conocía la prueba de Papanicolaou. Del total, solo un caso (5,9%) desconocía antecedentes de neoplasia cervical. Dada la correlación directa entre el VPH y el cáncer cervical, se evidencia la necesidad de abordar esta temática en el ámbito académico, priorizando métodos de prevención como el uso del preservativo y la realización de la prueba de Papanicolaou, promoviendo la discusión científica.

Palabras clave: *Estudiantes Universitarias; Sexo Femenino; Virus del Papiloma Humano; Cáncer de Cuello Uterino.*

1. INTRODUCTION

Cervical cancer is the fourth most commonly diagnosed type of cancer among women worldwide and, according to estimates from the National Cancer Institute (INCA), represents the fourth leading cause of cancer-related mortality in Brazil. It is characterized by the disordered replication of the epithelial lining of the uterine cervix, compromising the cellular epithelium and potentially invading other anatomical structures (INCA, 2023).

From a biological perspective, the stromal, squamous, and non-keratinized cells that cover the uterus undergo oncogenic alterations when infected by the Human Papillomavirus (HPV), a vector of sexually transmitted infection (STI). This infection leads to the integration of viral DNA into the nuclear synthesis of host cells, initiating disordered proliferation and inducing epithelial lesions. Depending on the cell type involved, these alterations may be classified as low-grade and low-risk lesions or high-grade and high-risk lesions (JAIN *et al*., 2023).

In the pathophysiological process of cervical cell abnormalities, Human Papillomavirus is believed to have a strong correlation with cervical cancer. HPV has a DNA-based genome and is transmitted through sexual intercourse without condom use. The insertion of viral DNA into the genome of uterine cells favors the occurrence of mutations and the development of cancer in this tissue (GREGÓRIO *et al*., 2024).

Although STIs are widely discussed in elementary and secondary education, especially those affecting adolescents and young individuals who engage in unprotected sexual activity and may become infected with and transmit HPV, health education initiatives within higher education institutions also contribute to prevention and health promotion. Therefore, it is relevant to address scientific information in order to assess whether these women effectively adhere to self-care practices related to their bodies (METELSKI *et al.*, 2025).

Despite the existence of public policies aimed at preventive health care—which include disease screening and detection in primary care through Basic Health Units (BHUs), as well as the performance of the Papanicolaou test, capable of early identification of epithelial and squamous lesions of the uterine cervix, and public campaigns emphasizing the ease of access to this clinical investigation—the topic still remains a social "taboo" for many young and adult women. Therefore, there is a need to address this issue within educational settings, particularly in higher education, where diverse groups of individuals bring intrinsic moral and social values related to sexuality from their daily lives.

HUMAN PAPILLOMAVIRUS (HPV) AND CERVICAL NEOPLASIA

In 2008, the German researcher Harald zur Hausen established an important correlation between the sexually transmitted vector that affects the uterine epithelium, HPV, and cervicovaginal lesions in women during the fourth phase of life, at the beginning of the menopausal period (WÓJCIK *et al.*, 2019). The first study addressing the viral vector and its relationship with the disease dates back to 1972, and throughout this retroprospective timeline of research, cervical cancer has been strongly associated with oncogenes (DONG *et al.*, 2017).

HPV is a non-enveloped DNA virus that exhibits tropism for the squamous epithelium of mucosal tissues and skin (LORENZI, 2019; PYTYNIA *et al.*, 2014). Viral biogenesis begins when infection of cells in the deeper (basal) layer occurs, with access facilitated through epithelial disruptions, becoming integrated through interactions between capsid proteins and specific receptors on the cell surface. Inside the cell, viral DNA is exposed to the action of nuclear enzymes, facilitating the expression of viral genes. Upon entering the cell, the viral genome is maintained episomally at a low copy number and replicates only alongside the host cell, without causing cytological alterations (PYTYNIA *et al.*, 2014).

Papillomaviruses are primarily precursors to the development of cervical carcinogenesis, as approximately 70% of all cervical cancers are caused by the oncogenes HPV16 and HPV18. These viruses can alter the genotype of the uterine epithelium, leading to cervical squamous cell carcinomas, which account for approximately 11% of cases and represent the most invasive cancer types, characterized by metastasis of squamous cells and adjacent tissues (BABA *et al.*, 2025).

HPVs are classified into more than 200 types, including low-risk HPVs, intermediate-risk HPVs, and high oncogenic-risk HPVs. Low-risk HPVs are directly associated with epithelial granulomas (warts) adherent to the mucosa of the labia minora and majora and the lower vaginal region. In contrast, intermediate- and high-risk oncogenic HPVs are related to premalignant lesions and invasive tumors (SOBRINHO *et al.*, 2020).

Infections caused by oncogenic HPV types 16 and 18 present semiological manifestations such as irregular or abnormal vaginal bleeding, pelvic pain, fatigue, vaginal discomfort, and vaginal discharge with a strong odor (CARVALHO *et al.*, 2019).

According to CARESTIATO (2016), cervical cancer is a slow-developing, multistage, and multifactorial disease that generally progresses silently, without symptoms in its initial phase, and is preceded by a precursor condition known as cervical intraepithelial neoplasia (CIN).

Cervical neoplasia accounts for 7.4% of all cancers, according to INCA (2020), and is the fourth most common type of cancer among women worldwide, causing approximately 275,000 deaths according to the World Cancer Organization (2019) in California, United States. Lifestyle factors such as the use of licit drugs (alcohol and tobacco), physical inactivity, unprotected sexual activity with multiple partners, hereditary gene expression, and multiple childbirths directly contribute to the development of this pathology (REES *et al.*, 2018).

Persistence of infection is a prerequisite for the progression of cervical intraepithelial neoplasia (CIN). CIN I is a histopathological sign with low sensitivity for the presence of HPV infection. CIN II comprises a heterogeneous group of lesions with varying potential for progression to cervical cancer. CIN III represents a lesion with more relevant histopathological features and a higher likelihood of progression to cervical cancer. If intraepithelial lesions progress, cervical cancer may develop. The most frequent type of this neoplasia is squamous cell carcinoma, responsible for approximately 89% of invasive cancer cases (AZEVEDO; DIAS, 2016).

In Brazil, between 2016 and 2017, 16,340 cases of cervical cancer were reported. During the 2018–2019 biennium, the prevalence of the disease among women in the fourth decade of life detected and recorded in the Unified Health System, as reported by INCA, increased by 16% compared to the previous biennium. This suggests that approximately four out of ten women may develop cervical neoplasia within a population of 100,000 women (LORENZI, 2019).

DIAGNOSIS OF CERVICAL CANCER BY THE PAPANICOLAOU TEST

Oncotic colpocytology, or the Papanicolaou test, discovered by Dr. George Nicholas Papanicolaou in 1917, made it possible to identify cellular alterations in the vaginal cervical fundus at different periods of the menstrual cycle (GURGEL *et al.*, 2019). In Brazil, the Papanicolaou test consists of collecting a small cellular sample from the cervical and vaginal epithelium for microscopic evaluation and diagnosis regarding the presence or absence of cancer (SILVA *et al.*, 2018).

The technique involves collecting a smear of cells originating from the squamocolumnar junction (SCJ), formed by the ectocervix and endocervix of the uterine cervix lining. It is a practical and low-cost procedure for cervical cancer screening (AGUILAR; SOARES, 2015).

The preventive examination of the uterine cervix is a method performed in primary health care, mostly carried out in Basic Health Units (BHUs) by a physician or nurse specialized in gynecology. For sample collection, a speculum is inserted into the vagina, and the professional induces slight exfoliation of the external and internal cervical surfaces using a wooden spatula and a small brush. The collected cells are then placed on a slide for analysis in a laboratory specialized in cytopathology (LORENZI, 2019).

According to DANTAS *et al.* (2018), the Papanicolaou test prioritizes women aged 25 to 64 years and ensures effective results, as it represents the easiest option for screening and prevention of cervical cancer, with low cost relative to its effectiveness. The method is more effective when shorter intervals between cytological collections are adopted, as this factor is demonstrated by a 95% reduction in the cumulative incidence of invasive cancer when collection is performed annually.

Among existing preventive methods, in addition to condoms and the quadrivalent vaccine, the Papanicolaou test stands out due to its ease of collection and its objective of identifying mutations in epithelial cells of the cervical fundus. The quadrivalent HPV vaccine contains the L1 protein of the viral capsid and is produced using recombinant technology with the aim of generating virus-like

particles targeting the two most common types present in cervical neoplasms, HPV16 and HPV18, which are responsible for 70% of cases of this type of neoplasia (INCA, 2020).

In addition to the target group of girls aged 9 to 14 years, the Ministry of Health, in 2017, made the quadrivalent HPV vaccine available to the male population aged 12 to 13 years, making Brazil the first South American country to offer this vaccine to boys within the national immunization schedule. It is noteworthy that, as of 2020, vaccination for boys has been extended to those aged 9 years and older (MAGANELI *et al.*, 2018).

INCA warns that although the HPV vaccine is a highly effective method for preventing precancerous lesions and cervical cancer, preventive screening remains indispensable for women. The Institute also highlights that vaccines provide protection only against some of the most common oncogenic HPV types and that 30% of cases of this neoplasia are caused by other oncogenic viral types (CARVALHO *et al.*, 2019).

Three types of vaccines have already been approved for primary prevention of HPV infection. The quadrivalent vaccine (HPV 6/11/16/18) was approved in 2006; in 2009, the bivalent vaccine (HPV 16/18); and more recently, in 2014 in the United States, the nonavalent vaccine (HPV 6/11/16/18/31/33/45/52/58). All are composed of virus-like particles (VLPs), which produce copies of the viral structural protein capable of inducing antibody production (AZEVEDO; DIAS, 2016).

With the implementation of public health policies, especially in women's health—such as regular gynecological testing in Basic Health Units (BHUs), effective family and reproductive planning, and the incorporation of the Rede Cegonha program—actions aimed at awareness, prevention, diagnosis, and treatment have been intensified (BRASIL, 2016).

Through recognition of the importance of these strategies, the Ministry of Health established the National Program for the Control of Cervical Cancer through Ordinance GM/MS No. 3040/9810, which included mechanisms for mobilizing and recruiting women, adoption of resources for structuring the care network, development of information systems, and definition of competencies across the three levels of government. Subsequently, these actions were transferred to the National Cancer Institute through Ordinance GM/MS No. 788/99, along with the creation of the Cervical Cancer Information System (SIS-COLO, 2016).

It is necessary to disseminate awareness programs on prevention and screening of cervical cancer, educate women about cancer symptoms, and encourage them to visit health centers, hospitals,

and clinics so that, in cases of a positive Papanicolaou smear, immediate treatment can be initiated. This screening strengthens health system services, including triage in primary diagnostic centers (SACHAN *et al.*, 2018).

According to SACHAN *et al.* (2018), the oncotic colpocytology test is considered the gold standard of cervical screening programs. The community should be informed about the Papanicolaou test, its purpose, and the required frequency through health promotion programs disseminated mainly by the media.

As women age, the periodicity of cervicovaginal examinations decreases, and embarrassment and fear of a positive result are cited as reasons for non-adherence to the test. However, scientific dissemination through pamphlets, quick searches using tools such as Google, and counseling by health professionals become important methods for promoting adherence to the examination (KHEZELI *et al.*, 2017).

In undertaking this field study, the objective was to analyze the knowledge of female undergraduate students from a higher education institution in the Extreme South of Bahia regarding cervical neoplasia and Human Papillomavirus (HPV). In addition, the study aimed to outline the sociodemographic profile of female students, assess the percentage level of knowledge about cervical neoplasia and HPV among female undergraduate students in health, humanities, and exact sciences programs, and compare knowledge across the three academic areas. Finally, the study sought to identify the main health promotion and prevention methods known and used by these students.

Thus, the guiding premise that motivated this research was: *"What is the scientific knowledge of female undergraduate students from a higher education institution in the Extreme South of Bahia regarding cervical neoplasia and HPV?"*

2. METHODOLOGY

This study sought to investigate behavioral characteristics based on knowledge about the relationship between cancer and the HPV virus in a specific sample composed of women aged between 18 and 50 years. The review of the articles used was delimited from 2014 to 2021, a retroprospective period preceding the current COVID-19 pandemic that is being experienced.

Data collection was carried out via Google Forms using an online questionnaire made available through representatives of the health, humanities, and exact sciences academic boards, who sent the

form by email and WhatsApp to female undergraduate students who composed the sample. The sample included female undergraduate students from the three academic boards of Faculdade do Sul da Bahia, aged over 18 years, who agreed to respond to the online questionnaire regarding knowledge of the relationship between HPV and cervical cancer. Acceptance to participate in the research was formalized through an online Informed Consent Form, also made available via Google Forms, which, in addition to clarifying the research objectives, authorized access for data disclosure.

Male undergraduate students and faculty members were excluded, as well as questionnaires that did not receive ethical authorization for data disclosure. Risks such as discomfort or embarrassment that could be caused by the data collection instrument were minimized through the explanations provided in the Informed Consent Form.

Personal information was not included in the development of the data collection instrument, in accordance with Resolution CNS 466/12, which establishes norms and guidelines for research involving human beings. The study also followed Circular Letter 02/2021, which authorizes research in virtual environments, based on Regulation 11/2020 that defines the processing of research protocols within the CEP/Conep System, regulating studies using online questionnaires in the current context.

The online questionnaire included objective and open-ended questions. In the first section, sociodemographic data were collected, such as level of education, age, marital status, family income, and number of children.

In the second section, epidemiological data related to women's sexual life were addressed, such as number of sexual partners, whether they had heard of HPV, whether they had presented any symptoms, knowledge about the viral vector, whether they had been vaccinated, and whether they had or had previously had any sexually transmitted infection (STI).

In the third section, participants were asked whether they were aware of a specific cervical cancer screening method, the Papanicolaou test, including whether they had already undergone the test or not, whether they knew its importance and function, and in which health system they usually performed it. Additionally, this section included questions regarding family history of cervical neoplasia, knowledge of diagnostic and preventive methods, and whether there was any relationship with the Human Papillomavirus.

3. RESULTS AND DISCUSSION

Sociodemographic variables such as age, marital status, number of children, and monthly income are presented by sample size and arithmetic mean (%) below. Of the 28 questions used in Google Forms, a response efficiency of 93% was obtained. A total of 53 responses from female students were collected; of these, two (2) responses were excluded due to the lack of authorization through acceptance of the Informed Consent Form. Thus, 51 students composed the study sample (Table 1). The academic boards were divided by area—health, humanities, and exact sciences—considering the sample size and arithmetic mean.

Table 1. Distribution of sociodemographic variables of female undergraduate students from a higher education institution in the Extreme South of Bahia (n = 51).

Variables	Categories	n	%
Academic boards			
	Health Sciences	30	57,0
	Humanities	19	36,0
	Exact Sciences	4	7,0
Marital status			
	Single	34	75,5
	Married	12	22,6
	Widowed	1	1,9
Number of children			
	1 to 3	16	30,0
	1 to 4	2	3,0
	No children	35	67,0
Monthly income			
	1 to 4 minimum wages	34	75,5
	5 to 8 minimum wages	12	22,6
	9 or more minimum wages	1	1,9
Total		51	100

The arithmetic mean age of the female students was 23.28 years, with the health sciences area accounting for the largest proportion of participants (57%). Regarding marital status, most participants were single (75.5%), and the predominant monthly income ranged from one to four minimum wages.

In the study conducted by Nepomuceno *et al.* (2015), which included twenty participants aged between 20 and 67 years, the mean age was 43 years. Regardless of sex and depending on the level of sexual activity, the lifetime risk of HPV infection is estimated at approximately 50% for both women and men. In most cases, women acquire the virus between 15 and 25 years of age (Wójcik *et al.*, 2019).

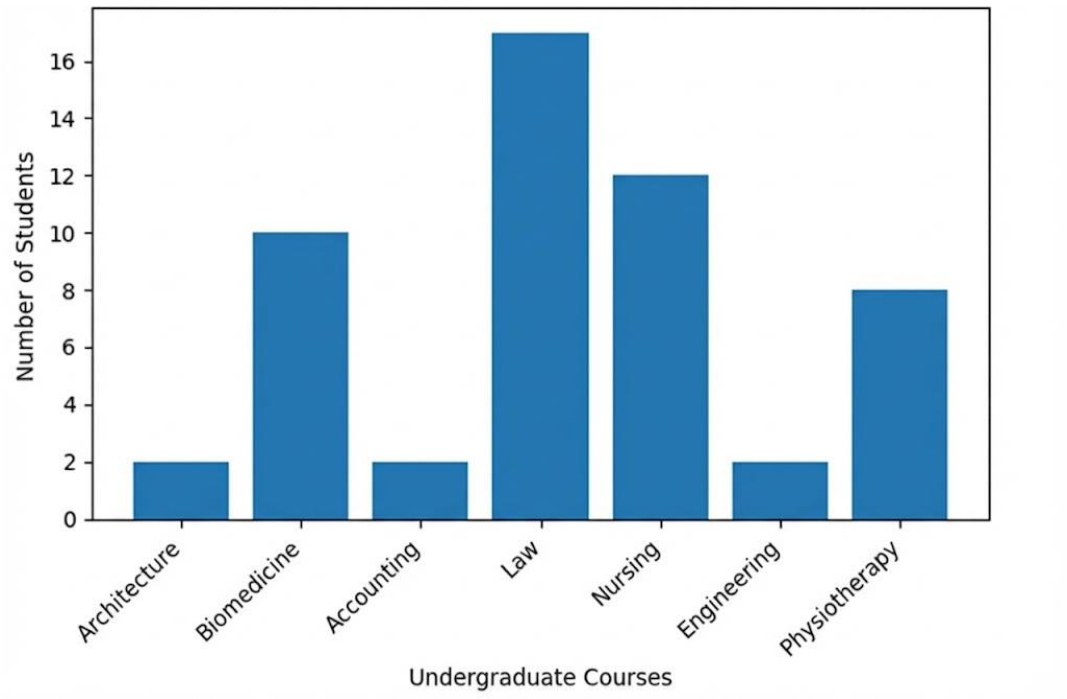
In the study by Aguilar and Soares (2015), the results corroborate the present findings regarding sociodemographic data. Most women were aged between 18 and 28 years; half had incomplete elementary education; approximately 65% reported a monthly income equal to or less than one minimum wage; about 72% initiated sexual activity at 18 years of age or younger; 64.2% did not use any contraceptive method; and the majority reported having only one sexual partner in the previous year.

Similarly, the study by Leite *et al.* (2018), with a sample size of 30 participants, showed that approximately 70% were married, only 3% had higher education, and 67% had a monthly income ranging from one to two minimum wages. With only 10% of single women, these findings support the hypothesis that there is a need for adolescent girls and women to improve their educational level, reducing misinformation and positively impacting self-care, as well as increasing opportunities for better employment.

In the study by Vieira *et al.* (2019), most students were single (86.3%), female (77%), aged between 18 and 23 years (84.2%), and reported being sexually active (67.6%). Only 2.8% of respondents did not adequately answer questions related to knowledge about cervical cancer and vaccination.

Regarding the distribution of female students by course (Figure 1), the sample consisted of 2 students from Architecture, 10 from Biomedicine, 2 from Accounting, 17 from Law, 12 from Nursing, 2 from Engineering, and 8 from Physical Therapy, composing the total study sample.

Figure 1. Distribution of female undergraduate students across degree programs at a higher education institution in the Extreme South of Bahia.

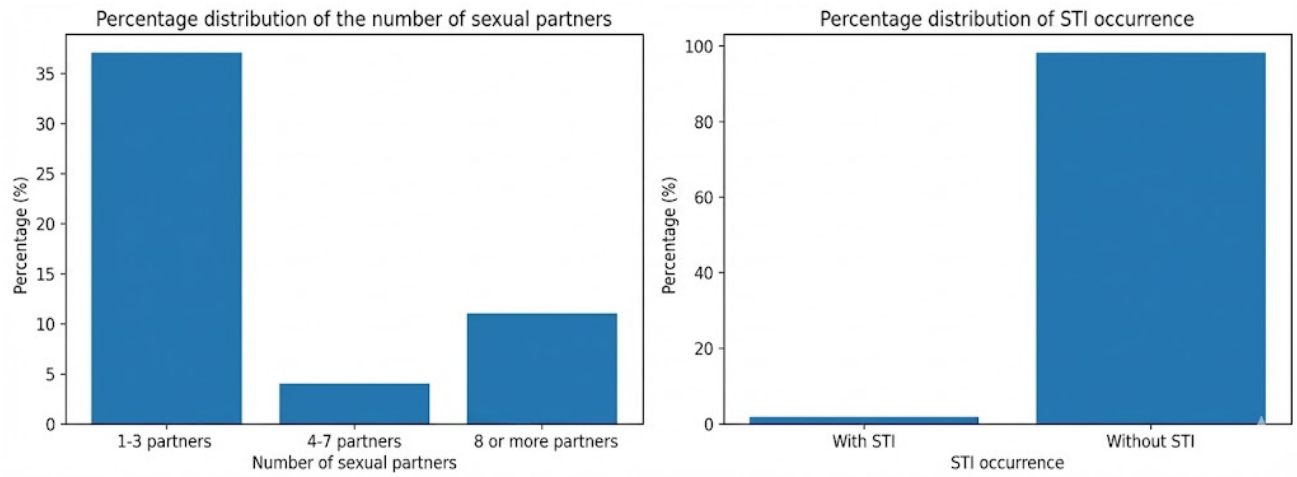


It was observed that students enrolled in health-related programs represented the majority when compared to those from the humanities and exact sciences. In the study conducted by Barreto (2014), women achieved higher correctness rates in most of the evaluated questions, highlighting a high level of knowledge regarding HPV infection. It is important to emphasize that women are more frequently enrolled in health-related courses and are present in greater numbers at higher educational levels.

A study conducted in 2018 by the Federal University of Santa Catarina evaluated 269 female students, also distributed across three academic areas—health sciences, humanities, and exact sciences—according to their respective degree programs. The results obtained were similar to those found in the present study. The distribution by course included Agronomy (n = 21), Law (n = 29), Physical Education (n = 20), Nursing (n = 30), Chemical Engineering (n = 30), Pharmacy (n = 27), Medicine (n = 29), Dentistry (n = 31), Veterinary Medicine (n = 25), and Animal Science (n = 27). In that study, the health sciences area comprised 137 participants (50.8%), whereas in the present study, health-related programs accounted for an arithmetic mean of 57% (30 students) out of a total of 51 participants (CARIJO *et al.*, 2018).

Regarding sexual behavior, 37 students reported having had one to three sexual partners, 4 students reported four to seven partners, and 13 students reported eight or more partners. Of the 53 respondents, two were excluded due to lack of authorization for data use, resulting in a final sample of 51 students. Among them, 98.1% (50 students) reported no history of sexually transmitted infections (STIs), while only one participant (1.9%) reported having had an STI or related symptoms (Figure 2).

Figure 2. Percentage distribution of the number of sexual partners and its relationship with the occurrence of sexually transmitted infections (STIs) among female students.



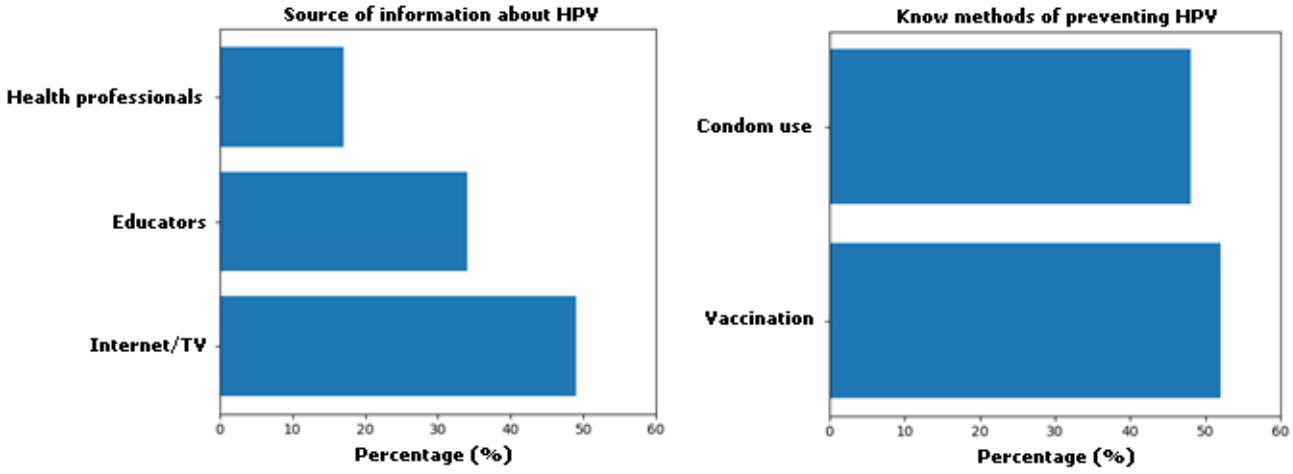
In the study by Ka *et al.* (2018), HPV infections were most often acquired during the early years of sexual activity, and the risk was proportional to the number of sexual partners. Among the 1,158 women included in the sample, 654 (56.5%) reported having had four to eight sexual partners during youth, a period corresponding to secondary education through undergraduate studies, and approximately 80% of this group reported having had some sexually transmitted infection or related symptoms.

The studies conducted by Pytynia *et al.* (2014) demonstrated that the high incidence of HPV infection is directly related to an extensive number of sexual partners during adolescence and adulthood, that low adherence to condom use increases the likelihood of other sexually transmitted infections, and that the lower infection rates observed in developing countries such as Brazil are a consequence of an efficient public health system that promotes prevention campaigns.

When asked whether they were familiar with the Human Papillomavirus and understood its

modes of transmission, approximately 95.30% of the students responded affirmatively. Regarding sources of information about HPV, consulting faculty members accounted for 37% of responses; the Internet and television represented 49%; and consultation with health professionals accounted for 17%. Concerning knowledge of prevention methods, 86.80% reported being aware of them. Vaccination accounted for 52% of the responses, while condom use accounted for 48% (Figure 3).

Figure 3. Knowledge of female students regarding sources of information about the virus and known prevention methods.

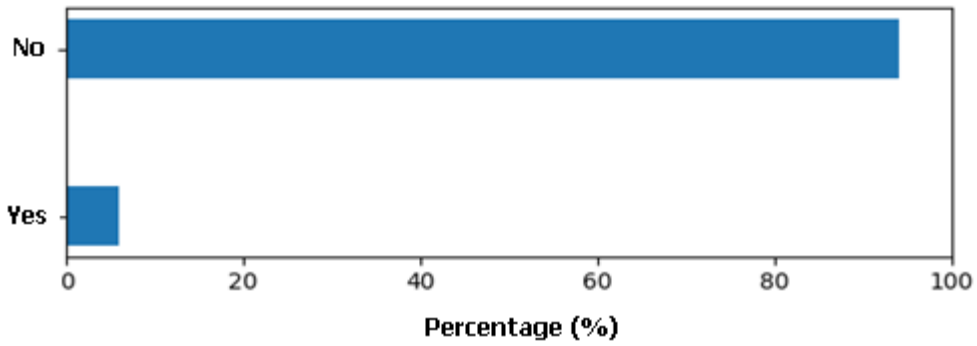


In the study by Chee Kai Chan *et al.* (2019), within 12 to 24 months of exposure to the virus, 90% of HPV infections are eliminated or become inactive. However, infections caused by high-risk HPV types persist, increasing the risk of progression to cervical cancer due to several factors, including low socioeconomic status, lack of population awareness, and inadequately implemented screening and vaccination programs.

In the study by Abreu *et al.* (2018), 40.1% of the respondents reported knowing what HPV is, and among these, 93.25% demonstrated a minimal level of knowledge about the disease. Most information on the subject was obtained through television (47.3%), followed by teachers (25.3%) and the internet (24.1%). Among those who claimed to have knowledge about HPV, 97.3% stated that sexual intercourse is a mode of transmission, while only 10% indicated contact with lesions in the oral, vaginal, or anal regions and did not give due attention to this form of transmission.

When questioned about the incidence of cervical cancer among the students' family members, approximately 50 students (94.10%) reported no history of the disease (Figure 5), with only one report of cervical cancer (5.90%).

Figure 5. Percentage distribution of family history of cancer among the students participating in the study.

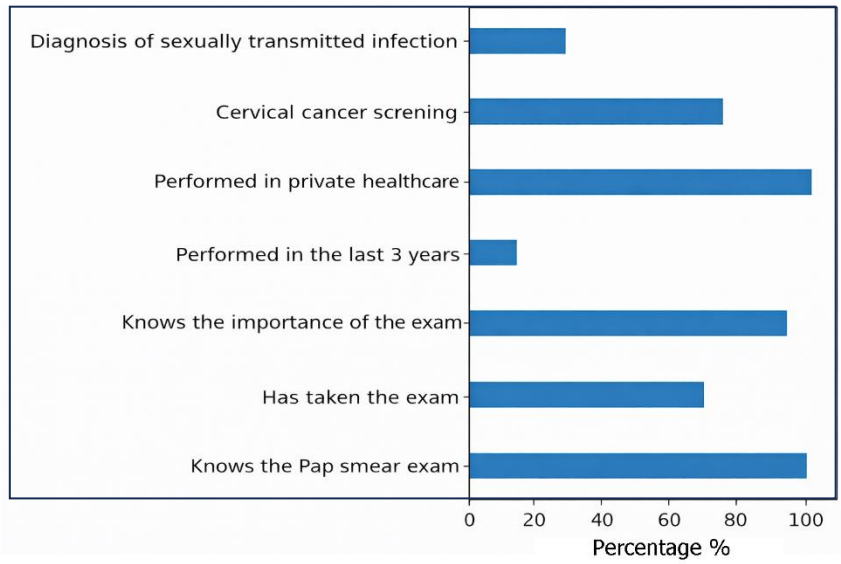


A finding in the literature that corroborates this result is that the diagnosis of the disease is slow. In the study by Formigosa and Silva (2021), cervical cancer (CC) develops in a chronic and progressive manner, with an interval of 10 to 20 years for its development, which facilitates the early detection of cellular alterations and, consequently, enables disease prevention and cure through early diagnosis and effective treatment.

In the study by Carijo *et al.* (2018), which evaluated 269 female students from different undergraduate courses at UFSM, regarding cervical cancer being caused by HPV, 66.37% (n = 178) were aware of this relationship, while 30.11% (n = 81) were unaware. Furthermore, concerning the development of carcinoma, 47.95% (n = 129), that is, less than half of the group, knew that this virus has the potential to cause cervical cancer, and 12.26% believed that HPV is not responsible for this type of carcinoma. In the same study, participants were asked whether they were aware of cases of cervical cancer in their family, and 49.81% (n = 134) reported not knowing. This finding highlights the importance of discussing the body and self-care.

When asked whether they were familiar with the Papanicolaou test, 88% responded affirmatively; 62.9% reported having undergone the test; 88% stated that they were aware of its importance. Regarding where the test was performed, 9.6% reported using the Unified Health System (primary health care units), whereas 90.4% underwent the test in the private health care system. As for the purpose of the Papanicolaou test, cervical cancer screening accounted for 66% of the responses, and the diagnosis of sexually transmitted infections accounted for 22.6% (Figure 6).

Figure 6. Percentage distribution of knowledge, performance, and aspects related to the Papanicolaou test among the students participating in the study.



In the study by Wójcik *et al.* (2019), considering the current state of knowledge and the contemporary understanding of the etiology of cervical cancer, it was observed that cytological examinations and their evaluation system (used since the 1950s and referred to as the "gold standard". Currently, expanded diagnostic testing using molecular algorithms is also recommended.

In the study by Leite *et al.* (2018), which included 30 participants, data collection revealed that 73% of the interviewees were aware of the examination and 77% understood its importance. When asked about who provided guidance regarding the examination and whether they knew its purpose, approximately 67% emphasized the role of health professionals from primary health care units as the main source of knowledge and information. Additionally, 56% identified that the test is used to screen for malignant cells, and 37% stated that colposcopy, or commonly the Papanicolaou test, is used to diagnose sexually transmitted infections.

Therefore, the main advantages of the examination are its simplicity and low cost. For example, the fact that test results are promptly available allows treatment to begin immediately after consultation when a positive result is confirmed. According to Maganelli *et al.* (2018), it is not by chance that this method has been widely used in low-income regions, where logistics are economically unfeasible or very difficult, particularly when compared to molecular HPV testing.

4. CONCLUSION

Thus, there is a direct correlation between cervical cancer and HPV. It became evident that after genetic mutation of cervical vaginal cells, proto-oncogenes lose their natural regulatory capacity and initiate oncogenesis, with cervical cancer developing through the infiltration of the human papillomavirus into squamous cells.

The students' knowledge is not limited; it was observed that students from the health sciences field demonstrate greater engagement with methods and techniques related to the disease and its association with infection and viral transmission vectors. It is necessary to address the topics of cancer and sexuality in the classroom, discussing preventive measures such as condom use, HPV vaccination, and the performance of the Papanicolaou test, a simple and highly effective method, as primary information prior to any sexual activity.

Although this study was based on a survey using questions and answers, there is an increasing need to investigate the etiopathogenesis of cancers within academic communities, including both students and faculty, establishing connections with other communities, such as the general public outside higher education institutions, and disseminating what truly matters: scientific knowledge.

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