# Cervical Cancer Screening And Its Relationship with Human Papillomavirus (HPV) Vaccination

**Rastreamento do Câncer do Colo do Útero e a Relação com a Vacinação Contra *Human Papillomavirus* (HPV)**
**Detección del Cáncer de Cuello Uterino y Ss Relación con la Vacunación Contra el Virus del Papiloma Humano (VPH)**

**RESUMO**
Este estudo visa analisar evidências científicas sobre os impactos da vacinação contra o Human Papillomavirus (HPV) na incidência de câncer do colo do útero. Trata-se de uma revisão integrativa com análise qualitativa. A coleta de dados foi realizada em três bases de dados, por meio dos Descritores em Ciências da Saúde (DeCS) combinados com o operador booleano OR. A tipagem por biologia molecular do Human Papillomavirus demonstrou maior sensibilidade na detecção de lesões em comparação ao exame citopatológico. Ademais, mulheres vacinadas apresentaram menores chances de desenvolver câncer cervical em relação às não vacinadas. Conclui-se que a vacinação e a tipagem viral modificam a necessidade e a periodicidade do rastreamento, permitindo intervalos mais amplos e maior precisão. Apesar da redução da mortalidade entre jovens, o rastreamento contínuo permanece essencial em mulheres de faixas etárias mais avançadas. Destaca-se a importância de políticas públicas que integrem vacinação, rastreamento e ações educativas em saúde.
**DESCRITORES:** Câncer do Colo do Útero; Vacinas contra Papillomavirus; Teste de Papanicolau

**ABSTRACT**
This study aims to analyze scientific evidence on the impacts of vaccination against Human Papillomavirus (HPV) on the incidence of cervical cancer. This is an integrative review with qualitative analysis. Data collection was performed in three databases, using Health Sciences Descriptors (DeCS) combined with the Boolean operator OR. Molecular biology typing of Human Papillomavirus demonstrated greater sensitivity in detecting lesions compared to cytopathological examination. Furthermore, vaccinated women were less likely to develop cervical cancer compared to unvaccinated women. It is concluded that vaccination and viral typing modify the need and frequency of screening, allowing for wider intervals and greater accuracy. Despite the reduction in mortality among young people, continuous screening remains essential for women in older age groups. The importance of public policies that integrate vaccination, screening, and health education actions is highlighted.
**DESCRIPTORS:** Uterine Cervical Neoplasms; Papillomavirus Vaccines; Papanicolaou Test

**RESUMEN**
Este estudio tiene como objetivo analizar la evidencia científica sobre los impactos de la vacunación contra el Virus del Papiloma Humano (VPH) en la incidencia del cáncer de cuello uterino. Se trata de una revisión integrativa con análisis cualitativo. La recolección de datos se realizó en tres bases de datos, utilizando Descriptores en Ciencias de la Salud (DeCS) combinados con el operador booleano OR. La tipificación por biología molecular del Virus del Papiloma Humano demostró una mayor sensibilidad en la detección de lesiones en comparación con el examen citopatológico. Además, las mujeres vacunadas tuvieron menos probabilidades de desarrollar cáncer de cuello uterino en comparación con las mujeres no vacunadas. Se concluye que la vacunación y la tipificación viral modifican la necesidad y la frecuencia del cribado, permitiendo intervalos más amplios y una mayor precisión. A pesar de la reducción de la mortalidad entre los jóvenes, el cribado continuo sigue siendo esencial para las mujeres en grupos de mayor edad. Se destaca la importancia de las políticas públicas que integran acciones de vacunación, cribado y educación para la salud.
**DESCRIPTORES:** Neoplasias del Cuello Uterino; Vacunas contra Papillomavirus; Prueba de Papanicolaou

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## INTRODUCTION

The cytopathological exam is a simple procedure in which cells are collected from the cervix. Women undergo this exam to screen for diseases and lesions that may arise throughout their lives, especially cervical cancer, which is the most common.[1] As this is an invasive procedure, it is necessary to educate women about its importance for sexual and reproductive health.[2] In this context, between 1980 and 2019, an average of 11,956 deaths from cervical cancer were recorded. [3]

The Human Papillomavirus (HPV) vaccine has been shown to be effective against various HPV infections and associated diseases, particularly cervical cancer. In view of this, actions such as vaccination campaigns should be implemented, especially for girls, with the aim of protecting against the appearance of genital warts, preventing sexually transmitted infections (STIs), and reducing the risk of cancer.

Studies highlight that vaccinated women show fewer early signs of HPV infection, which reinforces the importance of the vaccine in preventing cervical cancer. However, HPV vaccines do not eliminate the risk of cancer, so early detection remains a public health necessity.

Despite advances in cervical cancer prevention through HPV vaccination, there are still gaps in our understanding of how this immunization impacts the need for and frequency of screening. In addition, the influence of molecular biology typing on clinical practice is still under-explored in the literature, especially in the context of populations with different vaccine uptake rates and access to testing. Thus, these gaps justify further investigation of the topic.

For the development of the study, the following research question was formulated: how have HPV vaccination and typing changed the need for and frequency of cervical cancer screening? It was also defined as an objective to analyze and synthesize scientific evidence on the impacts of HPV vaccination on the incidence of cervical cancer.

This study can contribute significantly to the understanding of cancer prevention strategies by comprehensively exploring HPV vaccination and screening through cytopathological examination. Vaccination with immunizers acts in primary prevention, reducing the emergence of oncogenic HPV strains.[4] Screening, on the other hand, is considered a form of secondary prevention and aims to detect lesions early. 1 Thus, understanding how these two strategies complement each other can support the formulation of more effective public policies, optimize health system resources, and adapt guidelines to the current epidemiological reality. Furthermore, by considering HPV typing as a complementary tool, this study may support a more personalized approach to preventive care and serve as a basis for future research in this area.

## METHODOLOGY

This is an integrative review with qualitative analysis, produced based on a proposal that establishes six steps: first, the choice of theme, objective, and development problem; second, the determination of the inclusion and exclusion criteria for the studies; third, the selection of infor-


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mation extracted from each selected study; fourth, the evaluation of the studies included in the review; fifth, the interpretation of the results; and sixth, the presentation of the integrative review.7 In addition, this study was developed by nursing students and professors from the institution, under the guidance of a nurse specializing in women's health, aiming to analyze scientific evidence on the impacts of HPV vaccination on the incidence of cervical cancer.

To develop the question that guides the study, the PICO strategy was used, in which: (P) Patient/Problem represents women of reproductive age recommended for cervical cancer screening, (I) Intervention/Exposure corresponds to HPV vaccination, (C) Comparison refers to vaccinated and unvaccinated women, and (O) Outcome represents the impact of vaccination on adherence to and need for cervical cancer screening.

Thus, data were collected from the Scientific Electronic Library Online (SciELO) and Latin American and Caribbean Health Sciences Literature (LILACS) databases, using a combination of Health Sciences Descriptors (DeCS) with the Boolean operator: "Cervical Cancer" OR "Papillomavirus Vaccines" OR "Papanicolaou Test." In addition, PubMed was used as a database, employing the DeCS ( ) "Uterine Cervical Neoplasms," "Papillomavirus Vaccines," and "Papanicolaou Test" combined with the Boolean operator OR. This resulted in the collection of 47 studies, however, only 14 were selected, published between 2022 and 2024, which are described in Table 1.

The following inclusion criteria were defined for the selection of studies: (1) studies in Portuguese, English, or Spanish, (2) studies with full text available free of charge, and (3) studies related to the topic. The exclusion criteria were as follows: (1) studies with non-scientific methodologies, (2) opinion articles, (3) studies focusing exclusively on other types of cancer, and (4) articles without free access to the full text.

**Table 1 – Studies that underwent the collection and selection process**

| Authors and year | Title | Type of study | Objective | Main results |
|---|---|---|---|---|
| Dias EG, Barbosa MN, Lima KT, Campos LM, Caldeira MB (2024) | Women's perspectives on access to and performance of cytopathological examinations in a Family Health Strategy in a municipality in northern Minas Gerais | Descriptive study | To investigate women's perspectives on cytopathological examination and access to it in a Family Health Strategy in a municipality in northern Minas Gerais. | It is essential that professionals work beyond the Health Unit, also reaching communities and other spaces frequented by women, promoting educational actions to encourage them to undergo the exam, in addition to reorganizing the team's work processes to facilitate scheduling. |
| Lima JM, Lima LL, Aragão VS, Castro Júnior AR, Silva MR (2023) | "I feel invaded": Experiences with the Pap smear test and nursing care | Retrospective study | To understand women's experiences and feelings about Pap smears and nursing care. | The study revealed that women experience feelings of shame, discomfort, and bodily invasion during the Pap smear test, especially due to the gynecological position and intimate exposure. |
| Meira KC, Simões TC, Jomar RT, Dantas ES, Silva CM, Magnago C (2024) | Effect of age-period-cohort on cervical cancer mortality in the Midwest of Brazil, 1980-2019 | Ecological time series study | Analyze the effect of age-period-cohort on mortality rates from cervical cancer in Central-West Brazil. | Evidence of an age-period-cohort effect on cervical cancer mortality in the Midwest indicates the need to strengthen preventive and control measures aimed at women at higher risk. |
| Williamson AL (2023) | Recent Developments in Human Papillomavirus (HPV) Vaccinology | Literature review | To present recent advances in HPV vaccinology, describing virus types, available prophylactic vaccines, efficacy in different contexts, and global recommendations for HPV immunization. | HPV vaccination is effective in preventing infections and associated diseases, especially cervical cancer, and it is a priority to expand immunization among young people, especially where screening is insufficient, with catch-up campaigns to reach more people. |
| Lehtinen M, Pimenoff VN, Nedjai B, Louvanto K, Verhoef L, Heideman DA et al. (2023) | Assessing the risk of cervical neoplasia in the post-HPV vaccination era | Literature review | Review new demands and possibilities related to the management of intraepithelial and cervical neoplasia in women vaccinated with HPV and unvaccinated women. | The fact that cancer elimination is close does not eliminate the importance of cervical screening. |

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| Agudelo MC, Torres-González E, Agudelo S, Ramírez AT, Castañeda KM, Kinslow CJ et al. (2024) | Comparison of Hybribio-H13 and Hybrid Capture® 2 human papillomavirus tests for detection of CIN2+ and CIN3 | Original article | Comparing the performance of the low-cost Hybribio-H13 test with Hybrid Capture® 2 to detect cervical intraepithelial neoplasia grade 2 or 3 (CIN2 and CIN3). | The Hybribio-H13 test showed similar specificity to Hybrid Capture® 2 in detecting CIN2+ or CIN3+ lesions, but with lower sensitivity. |
| García L, Alonso R, Rodríguez G, Beracochea A, Caserta B, Pérez N et al. (2024) | Comparison of the performance of HPV typing and the Papanicolaou test as screening methods for the detection of cervical cancer and its precursor lesions in the ESTAMPA-Uruguay Project | Retrospective study | To analyze the best screening strategies for detecting precancerous lesions and cervical cancer. | Partial HPV typing followed by cytology has higher sensitivity for detecting CIN2+ lesions and is more efficient in excluding disease compared to cytology as a screening method. HPV genotypes 16/18 should be referred for colposcopy. |
| Shapiro GK (2022) | HPV Vaccination: An Underused Strategy for the Prevention of Cancer | Literature review | Summarize the impact of HPV on the global cancer burden and the potential benefit of HPV vaccination. | HPV vaccination is an effective, safe, and cost-effective strategy for the prevention of several cancers, especially cervical cancer, with a significant impact in both low- and middle-income countries and high-income countries; however, global vaccination coverage is still insufficient and has been further hampered by disruptions caused by the COVID-19 pandemic. |
| Macedo GR, Cardoso AM, Pícoli RP, Mattos IE (2025) | Trends in Cervical Cancer Mortality in Campo Grande, Mato Grosso do Sul, 2000-2019 | Ecological time series study | To analyze the trend of cervical cancer mortality rates in the municipality of Campo Grande, Mato Grosso do Sul, from 2000 to 2019. | Despite a slight reduction in cervical cancer mortality rates, the steady trend in cases of unspecified uterine sites indicates that controlling the disease in Campo Grande remains a challenge for local authorities. |
| Silva RG, Nogueira LM, Gatinho FG, Silva KR, Santos MR, Trindade LN (2024) | Mortality from cervical cancer in a capital city in the Brazilian Amazon | Cross-sectional study | To analyze mortality from cervical cancer in the city of Belém, Pará, Brazil. | The conclusion indicates that deaths from cervical cancer (CC) are more frequent among women with low educational attainment, housewives, single women, and those aged between 50 and 69 years. In view of this, it is recommended that screening activities be strengthened. |
| Moreno-Navas A, Gómez-Luque I, Cuenca JT (2022) | Human papillomavirus vaccine: bioethical assessment of gender discrimination | Literature review | Address the bioethical analysis of the extension of HPV vaccination to both sexes. | The exclusion of boys from HPV vaccination programs poses an ethical dilemma that compromises health equity. For both sexes, inclusion is justified by bioethical and epidemiological principles. |
| Gomes ML, Moura NS, Magalhães LC, Silva RR, Silva BG, Rodrigues IR et al. (2023) | Systematic literature review of primary and secondary cervical cancer prevention programs in South America | Literature review | Identify the 2022 recommendations made by the ministries of health of the 13 countries and regions of South America for human papillomavirus (HPV) vaccination and cervical cancer screening. | There are no national HPV vaccination programs or official guidelines for cervical cancer screening in some South American countries, such as French Guiana, Suriname, and Venezuela. This makes it difficult to combat the disease in these regions. |
| Silva LF, Backes MT, Soldera D (2024) | The role of nurses in humanized nursing consultations for oncotic cytology collection | Literature review | To describe the role of nurses in humanized nursing consultations for oncotic cytology collection. | Through this study, it was observed that the movement to incorporate this welcoming and humanized approach is already taking place, but very slowly. In this sense, we infer the importance of adopting methods to improve nursing consultations. |
| Silva PR, Nora CR, Maffacciolli R, Begnini D, Fontenele RM, Schlemmer JT et al. (2024) | Nursing practices in the prevention and screening of breast and cervical cancer | Multicenter study | Identify how breast and cervical cancer prevention and screening practices are carried out by nurses working in primary health care in Rio Grande do Sul. | The study highlights the importance of protocols to support the safe practice of nurses in primary care, with a focus on the prevention and screening of breast and cervical cancer. |

Source: Prepared by the authors (2025)


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## RESULTS

Fourteen studies were selected for this integrative review, published between 2022 and 2024, covering national (50%) and international (50%) studies. The investigations encompassed various designs, including retrospective, original, descriptive, literature review, multicenter, cross-sectional, and ecological time series studies.

In general, the studies demonstrated that HPV vaccination is associated with a significant reduction in the incidence of high-grade cervical lesions, especially among younger women. It is also worth noting that the introduction of viral typing in screening showed greater sensitivity in detecting Grade II Cervical Intraepithelial Neoplasia (CIN II) when compared to conventional cytology. This strategy made it possible to extend the interval between tests to up to five years in women with negative results for oncogenic HPV.

The epidemiological data collected identified a decline in cervical cancer mortality rates in populations with high vaccination coverage, while rates remained high in older age groups, especially between 50 and 69 years of age. This scenario reinforces the importance of continuing screening in this population, even in contexts of mass vaccination.

Regarding the role of nursing, some studies have highlighted that nurses, especially in Primary Health Care (PHC), not only collect cytopathological samples but also provide guidance on HPV vaccination and the importance of regular screening, promoting comprehensive, welcoming, and humanized health education.

Finally, the findings analyzed showed convergence regarding the effectiveness of vaccination and viral typing as complementary strategies in cervical cancer screening. These findings suggest that incorporating new technologies and care approaches can optimize access, adherence, and health outcomes for women.

## DISCUSSIONS

The findings of this review reinforce the evidence that viral typing outperforms conventional cytology in diagnostic sensitivity, which supports recent changes in screening guidelines in several countries. A negative result for high-risk genotypes allows for an interval of up to five years between tests due to the low risk of disease progression. On the other hand, detection of HPV genotypes 16 and 18 is associated with a higher risk of cervical lesions, requiring referral for colposcopy.

Similarly, a study on HPV vaccination mentions that the vaccine stands out for its potential to prevent cervical cancer, is inexpensive, and has a positive impact on mental health, especially among low-income populations, where a cancer diagnosis can cause greater psychological distress.

Thus, the results found[8,11] complement each other, as they suggest that incorporating HPV typing into cervical cancer screening represents an advance over the conventional cytopathological method, both because of its greater sensitivity in the early detection of lesions and because of the possibility of extending the intervals between tests if the result is negative, optimizing resources and reducing unnecessary procedures. In addition, HPV vaccination emerges as a strategy with not only biomedical but also social impact, especially when it comes to a vulnerable population, by reducing treatment costs and the psychological suffering associated with the disease, reinforcing the need for comprehensive and integrated public prevention policies.

Furthermore, through an ecological time series study on cervical cancer mortality, it was found that between 2000 and 2019, there were 551 deaths from cervical cancer in Campo Grande, of which 109 (19.78%) occurred in women between the ages of 50 and 69 and 105 (19.05%) between the ages of 60 and 69. In addition, young women aged 20 to 29 accounted for 17 deaths (3.08%), and there were no deaths among women under the age of 20.[9]

In addition, epidemiological data from other studies in the Amazon capital identified 299 deaths in women aged between 50 and 59 (43%) and 15 deaths (2.2%) in women aged between 20 and 29. Regarding the educational level of these women, 220 (31.7%) had incomplete high school education and 218 (31.4%) had incomplete higher education. Also, 410 (59%) of these women were housewives, 277 (39.9%) were single, and 558 (80.3%) were brown-skinned, respectively.[12] Therefore, cervical cancer caused by HPV continues to have high morbidity and mortality rates. These numbers could be lower with universal administration of the HPV vaccine.[13]

These findings 9,12-13 are corroborated, as they mean that mortality from cervical cancer is still significant among women in older age groups, especially between 50 and 69 years of age, which reinforces the importance of maintaining screening in this population. At the same time, the low incidence of deaths in young women, especially those under 20 years of age, may indicate a possible initial effect of vaccination.

In addition, an analysis of international data linking the Victorian Cervical Cytology Registry (VCCR) and the National HPV Vaccination Program Register (NHVPR) was conducted. As a result, it was found that women who were vaccinated have a lower risk of developing cervical lesions, especially wo-

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men under the age of 18, even those who did not receive all three doses of the vaccine.[14] Among Latin American countries such as Argentina, Colombia, Ecuador, Paraguay, Peru, and Chile, which are transitioning from cytopathological screening to HPV testing, the recommended age for screening is 30 years. The age limit ranged from 49 years in Peru, 64 years in Argentina and Chile, 65 years in Colombia and Ecuador, with Paraguay being the only country without a definitive age. In addition, only in Argentina do women over 30 years of age perform self-collection, with no regular history of screening conducted by health professionals. [15]

These findings[14-15] are complementary, as they mean that the data analyzed reinforce the effectiveness of HPV vaccination, especially when administered at an early age, even with incomplete schedules, suggesting significant protective potential even with partial adherence to the vaccination schedule. Furthermore, there is a regional trend in Latin America to review screening strategies, with , postponing the starting age, and diversifying the methods used, such as self-collection and the introduction of HPV testing as primary screening. This movement reveals adaptation to new scientific evidence and local epidemiological realities, but also points to inequalities in guidelines between countries, especially with regard to standardization of age groups and access to new technologies.

Nursing plays a fundamental role, especially when it comes to cervical cancer screening. Through a humane reception at the time of the consultation, women feel safe and encouraged to return whenever they need to be screened. [10] In addition, during the nursing consultation, nurses provide health education on HPV vaccination, screening frequency, and the importance of screening, leaving patients well informed.

In a study on nursing practices in the prevention and screening of breast and cervical cancer, it was found that the results indicate that cancer prevention and screening practices carried out by nurses in PHC have developed. This occurred during a period of professional autonomy and leadership in nursing. This scenario occurs due to the proximity to the community and the bond with patients. In addition to data collection, nurses perform other procedures and care, such as providing guidance and treatment in cases with signs of infection, offering comprehensive health care to women. [16]

Studies[10,16] complement each other by highlighting the role of nursing in cancer screening, as they emphasize the importance of a humanized reception and consultation as a space for health education, where professionals provide guidance on the HPV vaccine and encourage continuity of care. Furthermore, it broadens this perspective by recognizing that the practices carried out in PHC are the result of professional autonomy, in which nurses become the protagonists.

## CONCLUSION

HPV vaccination and viral typing have promoted changes in the need for and frequency of cancer screening. The greater sensitivity of HPV typing compared to conventional cytopathological examination allows for longer intervals between tests in negative cases and speeds up referral for colposcopy upon detection of genotypes 16 and 18. In addition, the vaccine has shown a positive impact on reducing mortality, especially in younger women. Despite advances, mortality in older women reinforces the need for continued screening, even with expanding vaccine coverage. Therefore, the summary of the findings reaffirms that the incorporation of vaccination and viral typing into screening represents an advance in the prevention of cervical cancer, while highlighting the importance of public policies that integrate vaccination, screening, and health education.

This study has limitations, such as the scarcity of national and international studies that jointly address vaccination, HPV typing, and changes in screening guidelines. For future research, it is recommended to conduct a longitudinal study to assess the impact of vaccination and typing on the incidence of cervical cancer over the years. It is also suggested that national research be developed to investigate the effectiveness of integrating vaccination, HPV testing, and changes in screening strategies. In addition, field research is recommended, in which interviews are conducted with users and professionals of the Unified Health System (SUS) to understand their perceptions, resistance, and acceptance of new technologies and guidelines related to screening.


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## REFERENCES

1. Dias EG, Barbosa MN, Lima KT, Campos LM, Caldeira MB. A perspectiva da mulher sobre a realização e o acesso ao exame citopatológico em uma Estratégia Saúde da Família de um município do norte de Minas Gerais. J. Health Biol Sci. 2024;12(1):1-6. doi: 10.12662/2317-3076jhbs.v12i1.5481.p1-6.2024.

2. Lima JM, Lima LL, Aragão VS, Castro Júnior AR, Silva MR. "Eu me sinto invadida": Vivências com o exame papanicolau e o cuidado de enfermagem. Revista Nursing. 2023;26(296):9232-38. doi: 10.36489/nursing.2023v26i296p9232-9245.

3. Meira KC, Simões TC, Jomar RT, Dantas ES, Silva CM, Magnago C. Efeito da idade-período-coorte na mortalidade por câncer do colo do útero no Centro-Oeste do Brasil, 1980-2019. Rev. eletrônica enferm. 2024;26:1-13. doi: 10.5216/ree.v26.75551.

4. Williamson AL. Recent Developments in Human Papillomavirus (HPV) Vaccinology. Viruses. 2023;15(7):1440. doi: 10.3390/v15071440.

5. Lehtinen M, Pimenoff VN, Nedjai B, Louvanto K, Verhoef L, Heideman DA et al. Assessing the risk of cervical neoplasia in the post-HPV vaccination era. Int. j. cancer. 2023;152(6):1060-68. doi: 10.1002/ijc.34286.

6. Agudelo MC, Torres-González E, Agudelo S, Ramírez AT, Castañeda KM, Kinslow CJ et al. Comparison of Hybribio-H13 and Hybrid Capture® 2 human papillomavirus tests for detection of CIN2+ and CIN3. 2024;44(Supl. 1):101-9. doi: 10.7705/biomedica.7061.

7. Mendes KD, Silveira RC, Galvão CM. Revisão integrativa: método de pesquisa para a incorporação de evidências na saúde e na enfermagem. Texto & contexto enferm. 2008;17(4):758-64. doi: 10.1590/S0104-07072008000400018.

8. García L, Alonso R, Rodríguez G, Beracochea A, Caserta B, Pérez N et al. Comparación del desempeño de la tipificación de HPV y el test de Papanicolaou como métodos de triaje en la detección del cáncer de cuello uterino y sus lesiones precursoras en el Proyecto ESTAMPA-Uruguay. Rev Med Urug (Montev). 2024;40(4):e203. doi: 10.29193/RMU.40.4.3.

9. Macedo GR, Cardoso AM, Pícoli RP, Mattos IE. Tendência da Mortalidade por Câncer do Colo do Útero em Campo Grande, Mato Grosso do Sul, 2000-2019. Rev. Bras. Cancerol. (Online). 2025;71(1):e-094863. doi: 10.32635/2176-9745.RBC.2025v71n1.4863.

10. Silva LF, Backes MT, Soldera D. Atuação do enfermeiro na consulta de enfermagem humanizada para coleta de citologia oncótica. Enferm. foco (Brasília). 2024;15:e-202477. doi: 10.21675/2357-707X.2024.v15.e-202477.

11. Shapiro GK. HPV Vaccination: An Underused Strategy for the Prevention of Cancer. Curr Oncol. 2022;29(5):3780–92. doi: 10.3390/curroncol29050303.

12. Silva RG, Nogueira LM, Gatinho FG, Silva KR, Santos MR, Trindade LN. Mortalidade por câncer de colo do útero em uma capital da Amazônia brasileira. Rev. enferm. UFPI. 2024;13(1):e4528. doi: 10.26694/reufpi.v13i1.4528.

13. Moreno-Navas A, Gómez-Luque I, Cuenca JT. Vacina contra o vírus do papiloma humano: avaliação bioética da discriminação por sexo. Pers Bioet. 2022;26(2):e2622. doi: 10.5294/pebi.2022.26.2.2.

14. Brotherton JM, Malloy M, Budd AC, Saville M, Drennan KT, Gertig DM. Effectiveness of less than three doses of quadrivalent human papillomavirus vaccine against cervical intraepithelial neoplasia when administered using a standard dose spacing schedule: Observational cohort of young women in Australia. Papillomavirus Res. 2015;1:59-73. doi: 10.1016/j.pvr.2015.05.005.

15. Gomes ML, Moura NS, Magalhães LC, Silva RR, Silva BG, Rodrigues IR et al. Systematic literature review of primary and secondary cervical cancer prevention programs in South America. Rev Panam Salud Publica. 2023;47:e96. doi: 10.26633/RPSP.2023.96.

16. Silva PR, Nora CR, Maffacciolli R, Begnini D, Fontenele RM, Schlemmer JT et al. Práticas de enfermeiros na prevenção e rastreio do câncer de mama e de colo uterino. Enferm. foco (Brasília). 2024;15(Supl 1):e-202406SUPL1. doi: 10.21675/2357-707X.2024.v15.e-202406SUPL1.

DOI: https://doi.org/10.36489/saudecoletiva.2025v15i98p16790-16803