Esc Anna Nery 2025;29:e20250057

RESEARCH

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Life-saving training in the Amazon: An update on the management of cervical cancer precursor lesions

Capacitação que salva vidas na Amazônia: Atualização no manejo de lesões precursoras do câncer de colo de útero

Capacitación que salva vidas en la Amazonía: Actualización en el manejo de lesiones precursoras del cáncer de cuello uterinos

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ABSTRACT

Objective: To analyze the impact of continuing health education on improving knowledge and clinical practices related to the follow-up of positive colpocytopathological test results for precursor lesions of cervical cancer. **Method:** A cross-sectional, analytical, quantitative intervention study conducted on the Amazon with 174 primary care professionals. The intervention consisted of educational workshops based on the Brazilian Guidelines for Cervical Cancer Screening. Questionnaires were administered before and after the workshops to assess the impact on professional practice. **Results:** After training, greater adherence to Brazilian guidelines was observed in the management of cervical cancer precursor lesions. This pattern was repeated in the conduct after negative colposcopy, cervical intraepithelial neoplasia I, conservative treatment for high-grade lesions, and cases of invasive carcinoma. There was a reduction in inappropriate responses in all categories evaluated. **Conclusion and implications for practice:** The study reinforces the importance of continuing health education, demonstrating its positive impact on adherence to clinical guidelines and improved outcomes for patients.

Keywords: Education, Continuing; Guidelines as Topic; Secondary Prevention; Wounds and Injuries; Uterine Cervical Neoplasms.

RESUMO

Objetivo: Analisar o impacto da educação permanente em saúde na melhoria do conhecimento e das práticas clínicas relacionadas ao acompanhamento dos resultados de exames colpocitopatológicos positivos para lesões precursoras do câncer cervical. **Método:** Estudo de intervenção transversal, analítico e quantitativo, realizado na Amazônia, envolvendo 174 profissionais da atenção primária. A intervenção consistiu na aplicação de oficinas educativas fundamentadas nas Diretrizes Brasileiras para o Rastreamento do Câncer do Colo do Útero. Questionários foram aplicados antes e depois das oficinas para avaliar seu impacto na prática profissional. **Resultados:** Após a capacitação, notou-se maior adesão às diretrizes brasileiras no manejo de lesões precursoras do câncer cervical. Este padrão se manteve nas condutas após colposcopia negativa, na neoplasia intraepitelial cervical I, no tratamento conservador para lesões de alto grau e nos casos de carcinoma invasor. Observou-se redução nas respostas inadequadas em todas as categorias avaliadas. **Conclusão e implicações para a prática:** O estudo reforça a importância da educação permanente em saúde, demonstrando seu impacto positivo na adesão às diretrizes clínicas e na melhoria dos desfechos para as pacientes.

Palavras-chave: Educação Permanente; Diretrizes; Lesões; Neoplasias do Colo do Útero; Prevenção Secundária.

RESUMEN

Objetivo: Analizar el impacto de la educación continua en salud en la mejora del conocimiento y las prácticas clínicas relacionadas con el seguimiento de los resultados de exámenes colpocitopatológicos positivos para lesiones precursoras del cáncer cervical. **Método:** Estudio de intervención transversal, analítico y cuantitativo, realizado en la Amazonía, que involucró a 174 profesionales de la atención primaria. La intervención consistió en la aplicación de talleres educativos fundamentados en las Directrices Brasileñas para el Rastreo del Cáncer de Cuello Uterino. Se aplicaron cuestionarios antes y después de los talleres para evaluar su impacto en la práctica profesional. **Resultados:** Después de la capacitación, se observó una mayor adhesión a las directrices brasileñas en el manejo de lesiones precursoras del cáncer cervical. Este patrón se mantuvo en las conductas tras colposcopia negativa, en la neoplasia intraepitelial cervical I, en el tratamiento conservador para lesiones de alto grado y en los casos de carcinoma invasor. Se observó una reducción en las respuestas inadecuadas en todas las categorías evaluadas. **Conclusión e implicaciones para la práctica:** El estudio refuerza la importancia de la educación continua en salud, demostrando su impacto positivo en la adhesión a las directrices clínicas y en la mejora de los resultados para las pacientes.

Palabras clave: Educación Continua; Guías como Asunto; Heridas y Lesiones; Neoplasias del Cuello Uterino; Prevención Secundaria.

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Submitted on 04/26/2025.
Accepted on 08/18/2025.

DOI:https://doi.org/10.1590/2177-9465-EAN-2025-0057en

INTRODUCTION

Cervical cancer (CC) has a significant potential for prevention and cure when diagnosed early through effective strategies such as organized screening and early diagnosis.[1] Despite this potential, morbidity and mortality rates in Brazil remain alarming, particularly in the northern and northeastern regions, which exhibit the poorest indicators for this disease.[2] In Pará State, 5,212 cases of CC were diagnosed between 2014 and 2023, accompanied by 3,602 deaths in the same period, underscoring the need for effective public policies focused on the prevention and early detection of the disease.[3]

The care pathway for CC includes primary prevention, which involves vaccination against human papillomavirus (HPV) in both boys and girls.[4] This is supplemented by secondary prevention through disease screening with Pap smears in women aged 25–64 years. The first two tests are performed annually, and if both are negative, subsequent tests are conducted every three years.[5] If test results are positive for precursor lesions, further diagnostic investigation and treatment are necessary. The failure to identify, confirm, and treat these lesions properly poses a risk of progression to CC.[6]

According to the Brazilian nomenclature for colpocytopathological reports,[7,8] precursor lesions of CC are classified as low-grade squamous intraepithelial lesion (LSIL), high-grade squamous intraepithelial lesion (HSIL), atypical lesions of undetermined significance possibly non-neoplastic (ASCUS), atypical lesions of undetermined significance that cannot rule out high-grade lesions (ASCH), atypical lesions of undetermined significance possibly non-neoplastic (AGCUS), atypical lesions of undetermined significance possibly non-neoplastic that cannot rule out high-grade lesions (AGCH), atypical lesions of undetermined significance of undefined origin possibly non-neoplastic or unable to rule out high-grade lesions (AOI), high-grade intraepithelial lesions unable to exclude microinvasion or invasive squamous cell carcinoma (LIE AG Mic. Inv.), adenocarcinoma *in situ* (AIS), and invasive adenocarcinoma.

From a histological perspective, the classification of these cytological findings groups cervical intraepithelial neoplasia (CIN) II and III as high-grade squamous intraepithelial lesions, while CIN I is classified as low-grade squamous intraepithelial lesions, usually associated with HPV infection.[9] High-grade intraepithelial lesions have a heightened potential for progression to invasive carcinoma.[10]

In Brazil, the screening and management of CC precursor lesions adhere to the Brazilian Guidelines, which aim to standardize the practices of healthcare professionals.[7] These guidelines emphasize periodic cytopathological examination as the primary strategy for early disease detection and stress the need for adequate follow-up of women with cytological changes or clinical suspicion of cervical carcinoma, promoting continuous and integrated care.[11]

For lesions such as ASCUS and LSIL, national guidelines recommend, as a first step, repeating the colpocytopathological control examination at intervals of 6–12 months, depending on the patient's age group. For more severe lesions, immediate referral for colposcopy is advised as a first step.[7] However, in the Xingu region, data extracted from DATASUS/SISCAN between 2018 and 2023 indicate that 2,190 colpocytopathological examinations with abnormalities were recorded in women over 25 years of age, although only 25.2% of ASCUS/LSIL cases followed the protocol for examination repetition.

This deficiency in appropriately directing women for diagnosis, treatment, and follow-up compromises adequate screening and comprehensive care, impeding effective prevention of CC.[12,13] Therefore, implementing continuing education strategies is crucial to improve the referral and follow-up of women with cytological abnormalities, ensuring adherence to national screening guidelines. The present study aims to analyze the effect of continuing health education on enhancing knowledge and clinical practice related to the follow-up of positive colpocytopathological test results for precursor lesions of CC.

METHOD

This is an analytical intervention study with pre- and post-evaluation, conducted in the Amazon, specifically in a region located in southwestern Pará. This area comprises nine municipalities: Altamira, Anapu, Brasil Novo, Pacajá, Porto de Moz, Senador José Porfirio, Medicilândia, Uruará, and Vitória do Xingu. Known as the Xingu Region, it spans an area of 250,793 km^2 with a population of 401,229, accounting for 4.4% of the population of Pará, and has a population density of 1.55 inhabitants/km^2. It is part of the economic and social structure of the Amazon and thus exhibits unique characteristics, such as significant sociocultural diversity, low population density, and considerable transformation driven by large-scale infrastructure and occupation projects, including the Trans-Amazonian Highway and the Belo Monte Hydroelectric Plant.

The Xingu Region has an estimated female population of 193,512. Regarding mortality indicators, in 2021, there was a rate of 16.8 deaths per 1,000 live births among children under one year of age, increasing to 18.97 deaths per 1,000 live births among children under five. Maternal mortality was at an alarming rate of 159.33 deaths per 100,000 live births.[14] Regarding CC, the mortality rate was 84.7 deaths per 100,000 women over ten years, corresponding to an annual average of 8.47 deaths per 100,000 women.[15]

The study population consisted of primary health care (PHC) professionals who play essential roles in analyzing colpocytopathological reports and referring patients for the follow-up of CC precursor lesions. A total of 174 health professionals participated in the study, including 107 nurses and 67 physicians. Exclusion criteria included those who were absent or unwell at the time of the intervention, those who joined the service after the workshops, and those who did not participate in all stages of the study.

The research tools developed included a questionnaire designed to collect data on the knowledge and practices adopted by healthcare professionals when treating women with positive

results for precursor lesions of CC. This instrument consisted of multiple-choice questions based on the recommended procedures in the Brazilian Guidelines for Cervical Cancer Screening.[7] The questionnaire was administered at two different time points, before the workshops and after their completion, enabling a comparative analysis of the training's impact on professional practice. Responses were provided without consulting support materials and under the supervision of the researcher.

The second tool involved the development of a protocol for managing abnormal colpocytopathological test results in PHC, with a particular focus on the Xingu Region. The document, entitled "Protocol for the Management of Abnormal Colpocytopathological Test Results in Primary Health Care - Xingu Region,"[16] was developed based on the consolidation of national guidelines,[7] suggesting that its legitimacy derives from adherence to these guidelines already established by the Ministry of Health. Its main objective was to ensure an effective and personalized approach to the follow-up of women with cytopathological changes. The protocol was distributed in printed form to all research participants.

The research was conducted through face-to-face meetings with health professionals, previously organized in collaboration with the Municipal Health Secretariats of the nine municipalities in the Xingu Region. Continuing education workshops were held locally in each municipality, ensuring the decentralization of training activities and the territorial coverage of the intervention. In each location, two meetings were held with the participating professionals, focusing on the development of the research.

The first meeting with health professionals lasted approximately four hours and began with a detailed presentation of the research objectives, providing an opportunity to clarify doubts and align participants' expectations. Subsequently, the free and informed consent form was signed. The professionals then completed an assessment questionnaire to identify their knowledge and practices in monitoring women with positive colpocytopathological test results. This was followed by a theoretical and practical workshop based on the Brazilian Guidelines for Cervical Cancer Screening, with guidance on appropriate clinical conduct in the event of positive results. The practical component of the training included the discussion of real cases, based on the analysis of tests extracted from the Cancer Information System, promoting the contextualization and application of the content.

The second session, held on the same day and lasting two hours, was primarily intended to assess the impact of the educational intervention. For this purpose, the questionnaire was reapplied immediately after the completion of the first session, allowing for the verification of potential advances in knowledge and clinical practices related to the follow-up of women with precursor lesions of CC.

The primary objective of the workshops was to foster an in-depth understanding and promote effective adherence to the Brazilian Guidelines for CC screening, thereby enhancing the technical capacity of the professionals involved.

The data collected through the questionnaires were organized in Microsoft Excel® spreadsheets, subsequently represented in tables, and subjected to descriptive and analytical analyses. The McNemar test was used to assess changes in the clinical conduct of health professionals in response to different colpocytopathological examination results before and after the educational intervention. This is a nonparametric test that does not require assumptions of data normality, unlike parametric tests. It is suitable for comparing two proportions in paired data from the same group of participants evaluated at two different times. The variables analyzed were categorical and dichotomous, classified as behaviors consistent or inconsistent with national guidelines for CC screening.

All statistical analyses were conducted using the Biostat software (v. 5.0),[17] considering a 95% confidence interval (CI) and a significance level α of 5% (p-value ≤ 0.05). Thus, results were considered statistically significant when the p-value was less than or equal to 0.05, and not statistically significant when the p-value was greater than 0.05.

This study adheres to the recommendations of Resolution 466/2012 and, as it involves health professionals in the process of training activities with the incorporation of the results of these activities into the research, it was submitted to and approved by the Research Ethics Committee of Núcleo de Medicina Tropical (CAAE no. 2 77312723.4.0000.5172).

RESULTS

This study was conducted with a sample of 174 health professionals, comprising 107 nurses and 67 physicians, all working in PHC in the Xingu Region. When analyzing the length of training and years of experience in PHC, the data indicate that, in general, nurses have longer training durations than physicians. The average length of training for nurses is 9.55 years, with a maximum of 17 years and a standard deviation of 4.61 years. In contrast, the average length of training for physicians is 5.82 years, with a maximum of 12 years and a standard deviation of 3.66 years.

When examining the length of service in PHC, there is a high concentration of professionals with less than 1 year of experience, representing 27.7% of nurses and 36.8% of physicians. With increasing length of service, there is a reduction in the frequency of both groups, with this decrease being more homogeneous among nurses and more pronounced among physicians after the first year. However, 25.2% of nurses and 20.9% of physicians have more than six years of experience in PHC. Additionally, regarding participation in training workshops on how to address tests indicating changes for precursor lesions, 85.9% of professionals reported that they had never participated.

Table 1 shows that adherence to national guidelines increased substantially after training for all lesions presented. In cases of ASCUS and LSIL results, the recommendation to repeat the Pap smear at appropriate intervals and according to age group was followed by most professionals, and referral for colposcopy was widely adopted in cases of more severe lesions. In immunosuppressed women, compliance with the ideal procedures saw a significant improvement.

Table 1. Nurses' actions after the first abnormal Pap smear result for precursor lesions of cervical cancer.

Lesion	Actions after the first abnormal Pap smear result	1st response	2nd response	p
		N	N	
ASCUS*	< 25 years: request repeat colpocytopathological examination in three years or upon reaching 25 years of age. If atypia persists, continue cytological follow-up every three years.	21 (12.1)	151 (86.8)	< 0.001
	25 and 29 years old: request a repeat colpocytopathological examination in 12 months; if ASCUS persists, request a colposcopy.	64 (36.8)	154 (88.5)	< 0.001
	< 30 years: request repeat Pap smear in 6 months; if ASCUS persists, request colposcopy.	84 (48.3)	154 (88.5)	< 0.001
	Immunosuppressed women: refer for colposcopy after the first abnormal test.	55 (31.6)	151 (86.8)	< 0.001
	Responses not consistent with Brazilian guidelines.	55 (38.3)	9 (5.2)	0.0039
LSIL†	< 25 years: repeat colpocytopathological examination in 3 years or upon reaching 25 years of age. If atypia persists, maintain triennial cytological follow-up.	25 (14.4)	141 (81)	< 0.001
	< 25 years old: request repeat colpocytopathological examination in 6 months; if LSIL persists, request colposcopy.	91 (52.3)	141 (81)	< 0.001
	Immunosuppressed women should be referred for colposcopy after the first abnormal exam.	61 (35.1)	130 (74.7)	< 0.001
	Responses not consistent with Brazilian guidelines.	92 (52.9)	20 (11.5)	< 0.001
HSIL‡	Refer for colposcopy regardless of age.	146 (83.9)	165 (94.8)	< 0.001
	Responses not consistent with Brazilian guidelines.	41 (23.6)	11 (6.3)	< 0.001
ASCH§	Refer for colposcopy regardless of age group.	126 (72.4)	163 (93.7)	< 0.001
	Responses not consistent with Brazilian guidelines.	78 (44.8)	20 (11.5)	< 0.001
AGC-US** /AGC-H††	Refer for colposcopy regardless of age group.	113 (64.9)	163 (93.7)	< 0.001
	Responses not consistent with Brazilian guidelines.	86 (49.4)	15 (8.6)	< 0.001
AOI‡‡	Referral for colposcopy regardless of age group.	115 (66.1)	162 (93.1)	< 0.001
	Responses not consistent with Brazilian guidelines.	73 (42)	9 (5.2)	0.0039
LIE AG Mic. Inv§§	Refer for colposcopy regardless of age.	144 (82.8)	168 (96.6)	< 0.001
	Responses not consistent with Brazilian guidelines.	28 (16.1)	4 (2.3)	0.125
(AIS) or invasive***	Refer for colposcopy regardless of age.	149 (85.6)	166 (95.4)	< 0.001
	Responses not consistent with Brazilian guidelines.	29 (16.7)	1 (0.6)	0.1

** AGCUS: Atypical glandular cells of undetermined significance, possibly non-neoplastic; †† AGCH: Atypical glandular cells of undetermined significance, possibly non-neoplastic, for which a high-grade lesion cannot be ruled out; ***AIS or invasive: Adenocarcinoma *in situ* (AIS) and invasive adenocarcinoma; § ASCH: Atypical squamous cells of undetermined significance, cannot exclude high-grade lesion; * ASCUS: Atypical squamous cells of undetermined significance, possibly non-neoplastic; ‡‡ AOI: Atypical cells of undetermined significance of undefined origin, possibly non-neoplastic or unable to rule out high-grade lesion; ‡ HSIL: High-grade squamous intraepithelial lesion; † LSIL: Low-grade squamous intraepithelial lesion; §§ LIE AG Mic. Inv: High-grade intraepithelial lesion, cannot exclude microinvasion or invasive squamous cell carcinoma.

Table 2 demonstrates improvements in the conduct of professionals managing patients referred for colposcopy who subsequently return to PHC with either negative results or a diagnosis of CIN I. For ASCUS, the recommendation to repeat the Pap smear at appropriate intervals was followed by 88.5% of professionals for women aged 25 to 29 and by 93.8% for those aged 30 and above. In the case of atypical squamous cells, it cannot be excluded that ASCH and AGC lesions are present, resulting in a significant increase in referrals for follow-up, according to the guidelines, reaching 83.1% and 92.5%, respectively. For AOI lesions, the correct conduct increased to 96%.

The results in Table 3 present data on lesions that, according to national guidelines, do not warrant colposcopy or CIN I, but instead recommend conservative treatment. In cases of LIE AG Mic.

Table 2. Subsequent procedures after negative colposcopy results or CIN I for squamous cell atypia, glandular atypia of undetermined significance, and undefined cell atypia.

Lesion	Actions after a negative colposcopy or CIN I result	1st Response	2nd Response	p
		N, %	N, %	
ASCUS*	25 and 29 years old: repeat Pap smear in 12 months; if normal, return to triennial screening after 2 consecutive negative tests.	99 (56.9)	154 (88.5)	< 0.001
	< 30 years: repeat Pap smear in 6 months; if normal, return to triennial screening after 2 consecutive negative tests.	87 (50)	158 (93.8)	< 0.001
	Responses not consistent with Brazilian guidelines.	28 (16.1)	8 (4.6)	< 0.001
LSIL†	< 25 years: repeat Pap smear in 6 months; if normal, return to triennial screening after 2 consecutive negative tests; if abnormal, continue follow-up.	78 (44.8)	147 (84.5)	< 0.001
	Responses not consistent with Brazilian guidelines.	80 (46)	16 (9.2)	< 0.001
HSIL‡	Colposcopy without abnormal findings, request review of the slide or new cytopathological examination.	110 (63.2)	131 (75.3)	< 0.001
	< 25 years: repeat cytopathology and colposcopy in 6 months; if negative, repeat cytology after 6 months and return to triennial screening after 2 consecutive negative Pap smears every six months.	38 (21.8)	144 (82.8)	< 0.001
	Responses not consistent with Brazilian guidelines.	42 (24.1)	15 (8.6)	< 0.001
ASCH§	Repeat cytopathology and colposcopy in 6 months; if negative, repeat cytology in 6 months and return to triennial screening after 2 consecutive negative Pap smears.	103 (59.3)	155 (83.1)	< 0.001
	Responses not consistent with Brazilian guidelines.	75 (43.1)	22 (12.6)	< 0.001
AGC-US**/ AGC-H††	Repeat cytopathology in 6 months regardless of age group and return to triennial screening after 4 consecutive negative semiannual exams.	75 (43.1)	161 (92.5)	< 0.001
	Responses not consistent with Brazilian guidelines.	131 (75.3)	31 (17.8)	< 0.001
AOI‡‡	Maintain cytology and colposcopy every six months at 6 and 12 months.	123 (70.7)	167 (96)	< 0.001
	Responses not consistent with Brazilian guidelines.	41 (23.6)	4 (2.3)	< 0.001

* ASCUS: Atypical squamous cells of undetermined significance, possibly non-neoplastic; § ASCH: Atypical squamous cells of undetermined significance, cannot exclude high-grade lesion; ** AGCUS: Atypical glandular cells of undetermined significance, possibly non-neoplastic; †† AGCH: Atypical glandular cells of undetermined significance, possibly non-neoplastic, which cannot rule out a high-grade lesion; ‡‡ AOI: Atypical cells of undetermined significance of undefined origin, possibly non-neoplastic or unable to rule out high-grade lesion; ‡ HSIL: High-grade squamous intraepithelial lesion; † LSIL: Low-grade squamous intraepithelial lesion.

Table 3. Subsequent procedures after conservative treatment for high-grade intraepithelial lesions unable to exclude microinvasion or invasive squamous cell carcinoma and adenocarcinoma *in situ* (AIS) and invasive adenocarcinoma.

Lesion	Actions in accordance with Brazilian guidelines for cervical cancer screening	1st Response	2nd Response	p
		N, %	N, %	
LIE AG Mic. Inv*	Cytology and colposcopy every six months for up to two years, followed by annual cytology for five years at the basic health unit (UBS); if a new test shows abnormal results, proceed according to the new results.	91 (52.3)	168 (96.6)	< 0.001
	Responses not consistent with Brazilian guidelines.	81 (46.6)	8 (4.6)	< 0.001
AIS or invasive †	If histopathological with clear margins or with CIN I: cytology at 6 and 12 months, followed by annual cytology for 5 years at the UBS.	63 (36.2)	159 (91.4)	< 0.001
	If histopathological with margins with CIN II and III: refer for consultation.	108 (62.1)	155 (89.1)	< 0.001
	Women who have undergone hysterectomy should undergo annual cytological follow-up for five years and triennial follow-up thereafter.	44 (25.3)	141 (81)	< 0.001
	Responses not consistent with Brazilian guidelines.	34 (19.5)	3 (1.7)	< 0.001

† AIS or invasive: Adenocarcinoma *in situ* (AIS) and invasive adenocarcinoma; * H-GLEI Mic. Inv: High-grade intraepithelial lesion that cannot exclude microinvasion or invasive squamous cell carcinoma.

Inv., adherence to the recommended procedures increased from 52.3% to 96.6%, while inappropriate responses decreased from 46.6% to 4.6%. A similar pattern was observed for AIS, reflecting a notable increase in adherence to appropriate procedures and a significant reduction in inappropriate responses.

DISCUSSION

Brazil has national guidelines for the control of CC, which guide the treatment and follow-up of women with abnormal test results. These guidelines aim to reduce the incidence, morbidity, and mortality associated with the disease, while also improving the quality of life of patients.[18]

Thus, considering the epidemiological relevance of CC in Brazil and its significant social impact, this study is notable for its unprecedented nature in the Amazon region. The scarcity of research in the literature on interventionist actions aimed at evaluating colpocytopathological test reports, to ensure adequate follow-up of patients according to the precursor lesion identified and in alignment with Brazilian guidelines for CC screening, reinforces its originality.

In this context, the findings of this study showed that the workshops resulted in a significant improvement in the conduct of health professionals regarding the referral of patients after the first abnormal Pap smear result for precancerous lesions. The marked reduction in inappropriate responses underscores the positive impact of these interventions, with statistically significant improvements (p<0.05). These results highlight the effectiveness of educational strategies in standardizing clinical practices, promoting greater adherence to national guidelines, and improving the quality of care provided to women.

In general, as evidenced by this and other studies, knowledge about the follow-up of precursor lesions remains deficient.[19-21] This scenario may be related to the lack of preparation of professionals, as 71.8% of those working in PHC reported not having received adequate training.[22] In the present study, this percentage was even higher, reaching 85.9%, highlighting a significant gap in professional training. These data reinforce the need to intensify continuing education efforts, focusing on training professionals in the correct application of the Brazilian Guidelines, ensuring more effective and standardized follow-up of patients.[23,24]

Continuing education in health, offered to all professionals regardless of the level of care, plays a fundamental role in promoting health, strengthening their autonomy, and improving oncological care.[24,25] For this process to contribute effectively to quality care for women, it is essential to ensure continuous opportunities for updating that integrate technical and critical knowledge about professional practice.[23] Thus, the care provided will be based on scientific evidence and aligned with current clinical protocols, ensuring greater safety, resolution, and effectiveness in care.[26,27]

In this regard, the findings of this study also indicate a reduction in inappropriate responses in all categories, evaluating the subsequent conduct adopted by professionals. This was observed both after negative colposcopy results or CIN I for squamous cell atypia and after conservative treatment for high-grade intraepithelial lesions with a risk of microinvasion, as well as invasive squamous cell carcinoma, AIS, and invasive adenocarcinoma. This finding reflects the effectiveness of continuing education workshops. Statistically significant results ($p < 0.05$) indicate that continuous training of professionals plays a crucial role in updating their knowledge, promoting greater adherence to national guidelines, and contributing to the quality of clinical practices.

Therefore, it is clear that investment in continuing education for PHC professionals is essential, as it enhances their skills and practices in CC control.[22] Additionally, it contributes to a more effective alignment between levels of care, as cancer reduction will only be achieved when secondary and tertiary prevention are efficiently integrated with primary prevention to ensure comprehensive care.[28,29]

In this scenario, the implementation of well-structured cytological screening programs targeting women in the at-risk age group, combined with rigorous follow-up and appropriate treatment, has proven highly effective in reducing the incidence of invasive cancer.[28-30] By investing in the continuing education of PHC professionals, it is possible to improve the quality of care in the management of cervical cancer precursor lesions. This investment, in turn, contributes to a substantial reduction in the progression of CC, promoting significant improvements in public health indicators and disease control.

CONCLUSION AND IMPLICATIONS FOR PRACTICE

The relevance of the continuing education process in improving and standardizing clinical practices is significant. The results of this study demonstrate that education played a crucial role in correcting outdated practices and promoting the adoption of evidence-based practices, thereby contributing to an enhanced quality of care and the early detection of cervical abnormalities. The notable reduction in inappropriate responses observed in the study suggests that the workshops played a vital role in updating and aligning professionals' knowledge with the latest recommendations. The low p-values support the conclusion that the differences in pre- and post-workshop behaviors were not random but rather a direct result of the educational interventions. These findings underscore the importance of health education initiatives, illustrating their positive impact on professional practice, promoting greater adherence to clinical guidelines, and ultimately improving patient outcomes.

In this regard, the practical implications of this study highlight the need to prioritize and continuously implement continuing health education for primary care professionals. This approach contributes to improved management of cervical cancer precursor lesions, increased adherence to clinical guidelines, reduction of inappropriate behaviors, and, consequently, a decrease in cervical cancer incidence and mortality.

A notable limitation of this research was the absence of repeated continuing education workshops, which precluded the ability to longitudinally evaluate the progression and consolidation of changes in professionals' behaviors over time.

Furthermore, although the study focused on primary care professionals, we acknowledge the importance of future investigations that include professionals from other levels of complexity in order to broaden our understanding of the impacts of training across the entire healthcare network.

ACKNOWLEDGMENTS

No acknowledgments.

FINANCIAL SUPPORT

No funding.

DATA AVAILABILITY RESEARCH

The contents underlying the research text are included in the article.

CONFLICT OF INTEREST

No conflict of interest.

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