



# **Perceptions and Factors Associated with Adherence to Cervical Cancer Screening Among Women in a Brazilian Municipality**

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**Cite as:** Alana Eduarda Martins Melo, Julliane Teixeira de Souza Costa, Orlando de Cássio Oliveira da Silva, Antônia Lyandra Jesus dos Santos, Brenda Silva Lisboa Alves, Denise Sena Maués, Gilberto Garcia Ribeiro Júnior, Isabelle Soria Galvarro Franco, João Victor Pina Marinho, Leiliane Cristina de Souza Costa, Maylane Cristina Barros Sousa, Michael Costa Santos, Paula Eduarda de Oliveira Batista, Paulo Victor Guterres Ribeiro, Simone Aguiar da Silva Figueira, Thays Cristiane da Silva do Nascimento, Waleska Raisa Santos da Rocha, Wiliane Freire Pinheiro, and Camila Carvalho do Vale. 2025. "Perceptions and Factors Associated With Adherence to Cervical Cancer Screening Among Women in a Brazilian Municipality". *Archives of Current Research International* 25 (10):186–196. <https://doi.org/10.9734/acri/2025/v25i101558>.

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### Authors' contributions

*This work was carried out in collaboration among all authors. All authors read and approved the final manuscript.*

### Article Information

DOI: <https://doi.org/10.9734/acri/2025/v25i101558>

### Open Peer Review History:

This journal follows the Advanced Open Peer Review policy. Identity of the Reviewers, Editor(s) and additional Reviewers, peer review comments, different versions of the manuscript, comments of the editors, etc are available here: <https://pr.sdiarticle5.com/review-history/144918>

**Original Research Article**

**Received: 12/08/2025**

**Published: 13/10/2025**

## ABSTRACT

**Background:** Cervical Cancer (CC) is among the diseases with the greatest impact on female mortality worldwide. In Brazil, estimates from the National Cancer Institute for the 2020–2022 triennium indicate approximately 16,590 new cases, corresponding to an estimated risk of 15.43 cases per 100,000 women per year during this period.

**Objective:** To analyse factors associated with knowledge and adherence to cervical cancer screening (PCCU) among women living in the municipality of Ananindeua – PA in the Brazilian Municipality.

**Methodology:** A cross-sectional, descriptive-analytical study was conducted with 100 women interviewed in a public setting. A structured questionnaire was applied through direct interviews, covering sociodemographic variables and questions related to knowledge and practice of the PCCU. Data were subjected to descriptive and inferential statistical analysis, with a significance level of 5%.

**Results:** Most participants were between 18 and 29 years old, single, had children, and predominantly used public health services. Educational level showed a significant association with knowledge about the PCCU ( $p=0.004$ ). Although 91% had undergone the test at least once, only 63% did so regularly. Barriers such as discomfort during the procedure and the influence of the professional's gender were reported.

**Conclusion:** Although most women demonstrated knowledge and had already undergone the test, regular adherence remains limited, particularly among groups with lower educational levels. Continuous educational initiatives and strategies to humanise care may expand screening coverage and contribute to reducing the incidence of cervical cancer in the region.

**Keywords:** Women's health; screening; pap smear; adherence; nursing.

## 1. INTRODUCTION

Cancer that starts in the cells of the cervix is called cervical cancer (CC). The cervix is the lower part of the uterus that connects to the vagina. According to the WHO, it is the fourth

most common cancer in women worldwide, with about 604,000 new cases and 342,000 deaths in 2020 (Rajan et al., 2025; Musa & Boateng, 2024). CC is among the diseases with the greatest impact on female mortality worldwide (Pan American Health Organization [PAHO],

2021). In Brazil, estimates from the National Cancer Institute (José Alencar Gomes da Silva National Cancer Institute [INCA], 2021) for the 2020–2022 triennium indicate approximately 16,590 new cases, corresponding to an estimated risk of 15.43 cases per 100,000 women per year during this period. Regarding morbidity, it is the second most incident neoplasm in the North (21.20/100,000) and Northeast (17.62/100,000) regions of the country, which also concentrate the highest levels of social inequality (Silva and Fontes, 2020).

In this context, investments in health promotion and cancer prevention are essential, particularly by expanding coverage of the Human Papillomavirus (HPV) vaccine and strengthening screening strategies, which allow for early diagnosis and increase the chances of cure (Marques, 2021).

HPV is a sexually transmitted infection that affects millions of people worldwide. Recent evidence indicates a higher prevalence among individuals aged 15 to 28 years, especially those with incomplete higher education (Souza and Costa, 2021; Ahmed et al., 2020). Human papillomavirus (HPV) is causally associated with 5% of cancers, including cancers of the cervix, penis, vulva, vagina, anus and oropharynx. There is also evidence of HPV's role in conjunctival cancers. The most important HPV-associated cancer is that of the cervix; over 95% of cervical cancers are associated with HPV, and in 2018, there were about 570,000 new cases and 311,000 deaths globally (Williamson, 2023).

In this regard, Moudatsou et al. (2022), CC prevention is a multifactorial process, influenced by individual, social, and cultural determinants. Differences in knowledge and adherence to screening may also be related to subjective factors, such as beliefs regarding Pap smear performance. Social interactions influence health outcomes by promoting the circulation of information as well as providing practical and emotional support (Medeiros et al., 2019).

Within this scenario, cervical cancer screening (PCCU) plays a crucial role in disease control. Commonly known as the Pap smear, the test consists of collecting cells from the cervix for laboratory analysis in order to detect possible

alterations suggestive of precancerous lesions or malignancy (Lima et al., 2018).

One of the main advantages of PCCU is its ability to identify lesions at an early, asymptomatic stage, enabling timely intervention and significantly increasing the chances of cure. The test also allows continuous monitoring of cervical health, making it possible to the procedure technically simple and generally considered painless. During the examination, the health professional inserts a speculum to visualise the cervix and collects cells with a spatula or brush, which are then sent to the laboratory. Overall, it is a quick process that usually causes minimal discomfort to the patient (Marques, 2021).

Nevertheless, the lack of knowledge and stigma regarding the test remains considerable. Many women, due to fear or insufficient information, neglect their health and fail to undergo Pap smears at the recommended frequency. This situation is further aggravated by myths and misconceptions, such as fear of pain or the mistaken belief that only sexually active women should undergo the test (Ngetich et al., 2020).

Given this scenario, the guiding question of this study is: What is the level of knowledge and adherence to cervical cancer screening (PCCU) among women residing in the municipality of Ananindeua/PA? To address this question, the study sought to analyse women's knowledge, practices, and sociodemographic profiles, relating these factors to adherence to the screening test.

Therefore, it is essential to strengthen awareness strategies aimed at emphasising the importance of cervical cancer screening. Disseminating clear and objective information about the disease and the test, while demystifying unfounded beliefs, is fundamental to increasing adherence and ensuring broader access to screening (Ahmed et al., 2020).

This study is justified by the need to explore the association between knowledge and adherence to PCCU among women in Ananindeua, PA, with the aim of supporting health education strategies focused on cervical cancer prevention and reducing its impact.

## 2. METHODOGY

### 2.1 Type of Study

This is a cross-sectional, analytical-observational study with a quantitative and qualitative approach linked to the CAP-Knowledge, Attitudes and Practices survey, which will be carried out through the application of questionnaires.

### 2.2 Place of Data Collection, Study Population and Sample

The study was carried out in Praça da Bíblia, located in Ananindeua. In this context, the study population was made up of all the women who were at the research site, and the sample was restricted to those who met the inclusion and exclusion criteria.

### 2.3 Criteria for Inclusion and Exclusion

Within the established population, women aged 18 or over and living in the municipality of Ananindeua were selected as the sample. Those with any limitation that made it impossible to conduct the interview were excluded.

### 2.4 Data Collection Instrument

The data was collected using a form, which was read out to the participants and filled in by the researchers at the time of the interview. The form was divided into two parts. The first part contained 5 questions which checked the participants' sociodemographic characteristics (place of residence, age, education, marital status and number of children). The second part was made up of 12 questions relating to knowledge of and adherence to the PCCU test.

In the second part, the questions were structured according to the odd-numbered Likert scale, using three possible answers (yes, maybe and no). The answers "yes" and "no" always equate, respectively, to a positive and negative attitude towards the point being addressed. "Maybe" represents uncertainty or not knowing the answer to the question.

### 2.5 Organisation and Analysis of Data

The data collected was transported and organised in Microsoft Office 365 Excel spreadsheets for descriptive and inductive

analysis of the results. The descriptive analyses were based on the absolute and relative frequencies of the results. For the second and third follow-up questions, the inductive statistical analyses will be carried out using the BioEstat 5.0 program. The ANOVA, One-Way test with Turkey or Kruskal-Wallis (5% significance level) will be applied to check for significant differences between the answers "yes" (positive attitude), "no" (negative attitude) and "maybe".

The data was then analysed and interpreted, and tables and graphs were drawn up to aid and objectify the research analysis and present the research results. Studies indexed in the Virtual Health Library (VHL) and Publications of Medical Literature Analysis and Retrieval System Online (PUBMED) will be used.

## 3. RESULTS

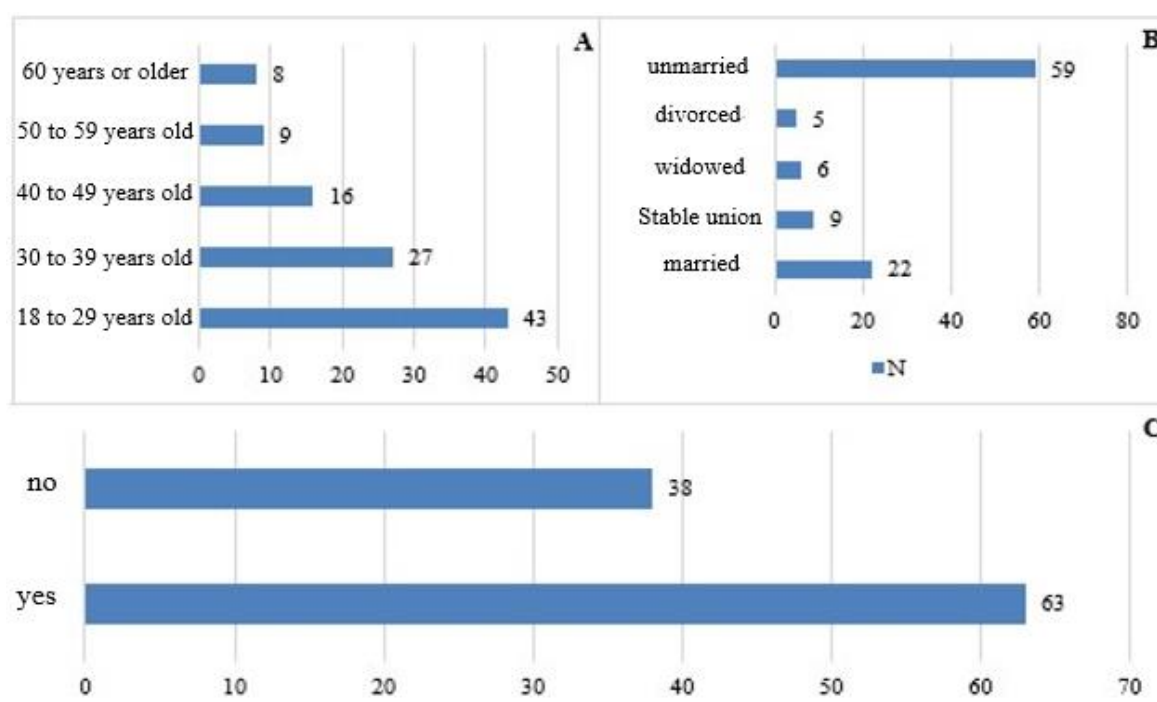
The results of this study reflect the responses of 100 women living in the municipality of Ananindeua, PA. The characteristics of these participants show that the majority were women aged between 18 and 29 ( $n = 43$ ), single ( $n = 59$ ) and with children ( $n = 63$ ).

It was also possible to see that the majority of the participants ( $n = 49$ ) only use the public health service and that the highest level of education among the participants is secondary school ( $n = 31$ ).

The results also showed that among the 100 women interviewed, 92% said that they had heard of PCCU (Q1). On the other hand, 5% said they were not aware of it, and 3% were not sure. With regard to understanding the purpose of PCCU (Q2), 81% of the interviewees understood its purpose, while 7% did not, and 12% were uncertain.

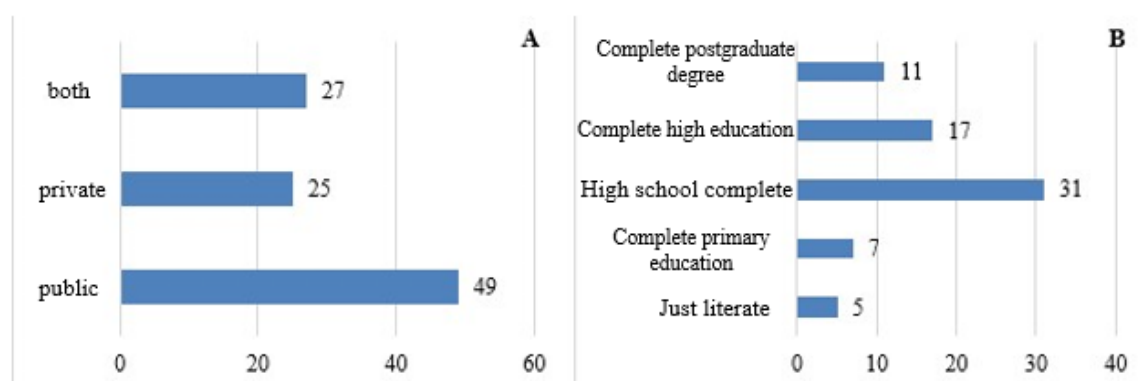
When asked about the recommended periodicity for performing the PCCU (Q3), the response was the same as the previous one, with 81% of the interviewees aware of the recommended frequency, 7% not aware and 12% uncertain.

With regard to the safety and pain of the PCCU (Q4), 88% of the participants believe that the test is safe and painless, while 12% do not. Regarding knowledge of the methods used in the CUCP test (Q5), 80% of the women were aware, 7% were not, and 13% were uncertain. When asked where the CUCP test can be carried out (Q6), 94% of the women knew, while 6% did not.



**Fig. 1. Sociodemographic profile of the research participants, according to age group (A); marital status (B) and children (C)**

Source: Survey data, 2023



**Fig. 2. Socio-demographic profile of the study participants, according to type of access to healthcare (A) and schooling (B)**

Source: Survey data, 2023

In terms of practising CUCP, 91% of women said they had been tested at least once (Q7), while 9% said they had not. Regarding regular scheduling and attendance at PCCU appointments (Q8), 63% of the women said they did this regularly, while 23% said they didn't, and 14% were uncertain. When asked about the existence of barriers that make it difficult to have a cervical cancer screening (Q9), 72% of the women said no, 17% said yes, and 11% were unsure.

Regarding the discomfort of performing the PCCU with a male professional (Q10), 54% of the women said they might feel uncomfortable, 17% said yes, and 29% said no. With regard to a negative or unpleasant experience when performing PCCU (Q11), 50% of the women said no, 26% said yes, and 24% were uncertain. Finally, when asked if they encourage other women to have regular cervical cancer screening (Q12), 75% of the women said yes, and 25% were uncertain, and,

for this question, none of the interviewees said no (Table 1).

In order to better assess the knowledge and practice of the PCCU within this sample, an analysis of variance was carried out using the Kruskal-Wallis test, in order to check for significant differences between the subgroups

of the variables analyzed (age group, marital status, children, schooling and type of access to health care), among which it was possible to see a variation of less than 0.005 in knowledge between the subgroups of age group and schooling, with no significant variation between the answers on PCCU practices (Table 2).

**Table 1. Knowledge and practice of women in the municipality of Ananindeua about the PCCU test**

Question	Knowledge of the PCCU (N= 100)	Yes	No	Maybe
Q1	Have you heard about PCCU?	92	5	3
Q2	Do you know the purpose of the PCCU?	81	7	12
Q3	Do you know the recommended periodicity for performing the PCCU?	81	7	12
Q4	Do you believe that the PCCU is a safe and painless test?	88	12	0
Q5	Do you know what methods are used in the PCCU test?	80	7	13
Q6	Do you know where the PCCU test can be carried out?	94	6	0
Question	PCCU Practice (N= 100)	Yes	No	Maybe
Q7	Have you ever undergone PCCU?	91	9	0
Q8	Do you regularly schedule and attend appointments to have your cervical cancer screening?	63	23	14
Q9	Do you face any barriers that make it difficult to carry out the PCCU?	17	72	11
Q10	Do you find it uncomfortable to have your cervical cancer screening done by a male professional?	17	29	54
Q11	Have you ever had a negative or unpleasant experience while undergoing PCCU?	26	50	24
Q12	Do you encourage other women around you to have regular cervical smears?	75	0	25

Source: Survey data, 2023

**Table 2. Analysis of variance between the groups of the variables analyzed**

Knowledge of PCCU (N=100)		
Age group	Affirmative answers	Value -p
18 to 29 years old	219	0.002
30 to 39 years old	144	
40 to 49 years old	123	
50 to 59 years old	108	
60 years and older	86	
Type of access to health	Affirmative answers	0.08
Public	108	0.004
Private	102	
both	92	
Education	Affirmative answers	
Only literate	8	
Complete primary education	189	0.6
Complete secondary education	215	
Complete higher education	156	
Postgraduate degree completed	78	
Civil status	Affirmative answers	
Married	256	0.6
Stable union	238	
Widowed	20	
Divorced	28	
Unmarried	260	

Source: Survey data, 2023

According to the results, the 18 to 29 age group had the highest number of affirmative answers regarding knowledge of the PCCU, with a significant p-value ( $p=0.002$ ). This result can be attributed to greater awareness and access to information by this age group, possibly due to awareness campaigns aimed at a younger audience. In addition, it is important to consider that younger people may be more engaged in seeking information about disease prevention, including cervical cancer.

With regard to the type of access to healthcare, the group that answered yes about knowledge of PCCU was relatively balanced between those who use the public system, the private system or both. The p-value ( $p=0.08$ ) suggests that there was no statistically significant difference between the groups. This may indicate that, regardless of the type of access to healthcare, information about the PCCU is being disseminated widely, reaching both users of the public and private systems.

With regard to schooling, the results showed that people who had completed secondary school (EMC) were the ones who gave the most affirmative answers about their knowledge of the PCCU, followed by those who had completed higher education (ESC). On the other hand, those who were only literate or had completed elementary school (EFC) had significantly fewer affirmative answers. The p-value ( $p=0.004$ ) suggests a statistically significant association between schooling and knowledge of UCP. This may indicate that higher levels of schooling are associated with greater awareness of the importance of the Pap smear in preventing cervical cancer.

Finally, with regard to marital status, the results revealed that married people and those in a stable union were the ones who responded most affirmatively about their knowledge of the PCCU, with associated p-values of 0.6. This result may reflect the influence of social and family support on awareness of health-related issues, including the importance of PCCU. On the other hand, widowers and divorcees had fewer affirmative responses, indicating the need for specific strategies to reach these groups, perhaps through targeted programs or awareness campaigns adapted to their needs and realities.

#### 4. DISCUSSION

The results presented indicate a clear understanding and knowledge of PCCU (Cervical

Cancer Prevention) among the women interviewed. The majority (92% - Q1) had already heard of the test, indicating that awareness campaigns and health education have been effective in conveying basic information about this important preventive test. In this sense, the study by Silva et al. (2021) also indicates that there is good knowledge of CBP among women.

With regard to understanding the purpose of CBCP, 81% of the women interviewed said they understood its purpose, while 7% did not, and 12% were uncertain. This result can be attributed to various factors, including the lack of adequate information about the importance of the test and the need for more targeted educational campaigns. A study carried out by Lima et al. (2022) pointed out that a lack of understanding about the purpose of the PCCU may be associated with lower levels of schooling and less access to health information.

Furthermore, when asked about the recommended frequency for performing cervical cancer screening, the answers followed a similar pattern, with 81% of the interviewees aware of the recommended frequency, 7% not aware and 12% uncertain. This lack of clarity regarding frequency may be related to gaps in communication between health professionals and patients, as well as challenges in implementing effective screening programs. A study published by Martins and Motta (2020) highlighted the importance of individualised counselling and ongoing education to ensure that women fully understand the screening guidelines for cervical cancer.

The results also indicated that the vast majority of women (88%) believe that the PCCU is a safe and painless test, which is crucial for promoting adherence to the preventive exam. This positive perception is in line with the findings of a study conducted by Silva et al. (2020), which highlighted the importance of patients' trust and comfort in relation to cancer screening procedures.

With regard to the methods used in the PCCU exam, 80% of the women were aware, 7% were not, and 13% were uncertain. This lack of knowledge about the methods may point to the need for improvements in communication between health professionals and patients, as well as the importance of educational campaigns that clearly and accessibly address the procedures involved in the PCCU. Strategies

aimed at health education, such as information leaflets, explanatory videos and information sessions, can play a crucial role in this regard (Dias et al., 2021).

Finally, familiarity with the places where the cervical cancer screening test can be carried out was high, with 94% of women indicating knowledge of this aspect, while 6% were unaware. This information is encouraging, as it suggests that the majority of women are aware of the accessible places where the test can be carried out, which can facilitate the search for medical assistance and adherence to cervical cancer screening (Rezende et al., 2021).

Regarding the practice of cervical cancer screening, 91% of the women interviewed said they had undergone the test at least once, while 9% reported not having done so. These results indicate that the vast majority of women are aware of the importance of the test and have already taken it, which is fundamental for the prevention and early diagnosis of cervical cancer (Ribeiro et al., 2023).

However, in relation to scheduling and regular attendance at PCCU appointments, only 63% of women said they did so regularly, while 23% said they did not and 14% were uncertain. This discrepancy can be attributed to various factors, including socio-economic barriers, lack of awareness about the importance of regular screening and even issues related to access to health services. A study conducted by Santos et al. (2020) highlighted that women with lower socioeconomic status and those living in more remote areas are more likely to face challenges in scheduling and regularly attending PCCU appointments.

In addition, when asked about the barriers that make it difficult to have a cervical cancer screening, 72% of the women reported not encountering any difficulties, 17% said they did, and 11% were uncertain. These barriers can include issues such as lack of time, concerns about the discomfort of the test and transportation difficulties, among others. A study published by Silva et al. (2021) found that a lack of understanding about the importance of the test, fear of the result and a lack of family support may be factors that contribute to the barriers faced by women when undergoing the PCCU.

With regard to negative or unpleasant experiences while undergoing the PCCU, 50% of

the women interviewed said they had not had such an experience, 26% said they had, and 24% were uncertain. These results highlight the importance of ensuring a positive and comfortable experience for women during the examination. A study conducted by Saldanha et al. (2021) pointed out that previous negative experiences, such as discomfort, pain or embarrassment, can have an adverse impact on women's willingness to undergo regular cervical cancer screening.

In addition, when asked if they would regularly undergo CUCP, 71% of the women said yes, while 25% were uncertain. The importance of regular screening cannot be underestimated, since early detection is fundamental for the successful treatment of cervical cancer. The lack of regularity in performing the PCCU may be associated with factors such as lack of information about the recommended periodicity, barriers to accessing health services and previous negative experiences, as mentioned previously (Silva et al., 2021).

It is essential to address the barriers that prevent regular cervical cancer screening and ensure that women have access to quality health services, with professionals trained to offer a comfortable and welcoming environment. Strategies aimed at health education, raising awareness about the importance of PCCU and promoting positive experiences during the exam are fundamental to increasing adherence and regularity in carrying out the procedure (Silva et al., 2020).

The issue of discomfort in performing the PCCU with a male professional was also relevant, with 54% of the women indicating that they might feel uncomfortable, 17% saying yes, and 29% saying no. This perception of discomfort can have an impact on seeking preventive examinations and highlights the importance of ensuring that women have the option of choosing health professionals of the gender they feel most comfortable with. A study conducted by Lopes et al. (2021) highlighted that respecting women's gender preference in relation to health professionals can positively influence adherence to PCC.

The results of this study showed that the population sample in the municipality of Ananindeua had good knowledge of the PCCU test, and only the variables schooling and age group proved to be factors capable of influencing knowledge, since statistically significant



variations were seen between the groups of these variables.

Similar to these results, Teixeira et al. (2021) found in their study that the significant difference was observed in the 18-29 age group, which was approximately 4 times less likely (OR = 0.244, CI = 0.068-0.689, p-value = 0.014) to have inaccurate knowledge about CUCP compared to other age groups.

Other recent studies on PAC related to UCP have also revealed that people with higher levels of education are less likely to have inadequate knowledge on this subject (Maciel et al., 2021; Nascimento et al., 2022; Silva et al., 2022).

## 5. CONCLUSION

The results obtained in this study provided valuable insights into the knowledge and practice of women living in the municipality of Ananindeua, PA, in relation to the Pap smear (PCCU). The representative sample of 100 women revealed significant demographic characteristics, with the majority of participants being women aged between 18 and 29, single and with children. In addition, the predominance of exclusive use of public health services and the level of education, mostly limited to high school, are relevant aspects to consider.

The results of the participants' responses in relation to their knowledge of the PCCU showed that the vast majority had heard of the test and understood its purpose and recommended periodicity. However, there was a significant proportion of women who showed uncertainty or lack of understanding about certain aspects of the test, such as safety, associated pain and the methods used.

The analysis of variance carried out to investigate possible differences between demographic subgroups revealed that age group and schooling showed significant variation in relation to knowledge, while no significant differences were observed in relation to PCCU practices between the subgroups.

It is important to note that the majority of the participants reported having undergone the PCCU exam at least once, and a considerable proportion said they regularly attended appointments related to the exam. However, the existence of barriers that hinder the performance of the PCCU, as well as the possible influence of

the health professional's gender on the women's experience, are aspects that deserve special attention.

In addition, the significant number of participants who said they encouraged other women to undergo regular cervical cancer screening is encouraging and highlights the potential for educational and awareness-raising actions within the community.

Given these results, it is clear that strategies aimed at improving knowledge and practice of PCCU among women living in Ananindeua, PA are important. Awareness campaigns, educational programs, and actions to mitigate the barriers identified can play a crucial role in promoting health and preventing cervical cancer in this population.

Therefore, this study provides a solid basis for the implementation of targeted interventions to improve understanding, access and adherence to cervical cancer screening, with a potential positive impact on the health of women served by the local health system.

## CONSENT

As per international standards or university standards, Participants' written consent has been collected and preserved by the author(s).

## ETHICAL APPROVAL

As per international standards or university standards written ethical approval has been collected and preserved by the author(s).

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Author(s) hereby declare that NO generative AI technologies such as Large Language Models (ChatGPT, COPILOT, etc) and text-to-image generators have been used during writing or editing of this manuscript.

## COMPETING INTERESTS

Authors have declared that no competing interests exist.

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