



Mammography: knowledge and prevention among the academic community

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Summary

This study aimed to evaluate the level of knowledge and prevention practices related to mammography among women belonging to the academic community of a private higher education institution. It is a quantitative, cross-sectional, and analytical study, conducted using a structured online questionnaire applied to 55 participants. The results showed that, although most respondents recognize the importance of mammography for the early detection of breast cancer, significant gaps persist regarding the ideal age to begin screening, the appropriate frequency of the examination, and the real effectiveness of breast self-examination. It was also observed that emotional factors, such as fear of diagnosis and discomfort during the procedure, as well as socioeconomic and logistical barriers, are determining factors for low adherence to preventive practices. Among the main sources of information cited were awareness campaigns and social networks, which reinforces the need to improve the means of scientific dissemination, making them more accessible and evidence-based. It is concluded that ongoing health education initiatives in the university environment are fundamental to improving knowledge, correcting misconceptions, and encouraging appropriate mammographic screening. The implementation of continuous educational strategies can significantly contribute to the early diagnosis of breast cancer and, consequently, to the reduction of morbidity and mortality rates associated with the disease, strengthening the role of educational institutions in promoting women's health.

Keywords: Diagnosis; Breast neoplasms; Prevention; Health education; Breast self-examination.

Abstract

The present study aimed to assess the level of knowledge and preventive practices related to mammography among women belonging to the academic community of a private higher education institution. This is a quantitative, cross-sectional, and analytical study conducted through an online structured questionnaire applied to 55 participants. The results showed that, although most respondents recognize the importance of mammography for the early detection of breast cancer, significant gaps remain regarding the ideal age to start screening, the appropriate frequency of the exam, and the actual effectiveness of breast self-examination. It was also observed that emotional factors, such as fear of diagnosis and discomfort during the procedure, as well as socioeconomic and logistical barriers, are determining elements for low adherence to preventive practices. The main sources of information reported were awareness campaigns and social media, which reinforces the need to improve scientific communication channels, making them more accessible and evidence-based. It is concluded that permanent health education actions within the university environment are essential to enhance knowledge, misconceptions, and encourage appropriate mammographic screening. The implementation of continuous educational strategies may significantly contribute to the early diagnosis of breast cancer and, consequently, to the reduction of morbidity and mortality rates associated with the disease, strengthening the role of educational institutions in promoting women's health.

Keywords: Diagnosis; Breast Neoplasms; Prevention; Health Education; Breast Self-Examine

Introduction

Breast cancer is the most common type of cancer among Brazilian women. excluding non-melanoma skin cancer, it is considered one of the largest public health challenges. In 2023, the National Cancer Institute (INCA) estimated approximately 73,000 new cases of the disease in the country, revealing an incidence rate expressive (INCA, 2023).

Mortality associated with breast cancer largely reflects the Inequalities in access to early diagnosis and specialized treatment, being more high in regions with lower coverage of preventive exams and insufficient infrastructure. health services (Pereira et al., 2020). It is estimated that around 30% of women diagnosed at advanced stages could have received an earlier diagnosis if had timely access to mammography and subsequent care (Lopes et al., 2021).

Mammography is a non-invasive imaging test that uses ionizing radiation to... to detect changes in the breasts, such as lumps, microcalcifications, and other suspicious lesions, It represents the main tool for early detection of breast cancer. Its Periodic screening allows for the identification of tumors in early stages, making it possible to... less aggressive interventions, greater therapeutic efficacy and better prognosis (Migowski et al., 2018).

In Brazil, the National Breast Cancer Control Policy recommends... the exam every two years for women aged 50 to 69, according to Ministry guidelines. Health (Brazil, 2023). Several studies demonstrate that mammography performed in a way Systematic screening can reduce breast cancer mortality by up to 30%, especially when integrated into organized screening programs, broad population coverage and adequate infrastructure for diagnosis and treatment (Souza et al., 2019; Vieira et al., 2020; Paiva et al., 2021).

Despite the proven benefits, uptake of the test remains uneven across the territory. national. Factors such as socioeconomic profile, level of education and conditions of Access to healthcare services directly influences the likelihood of mammograms being performed. Women Those with higher levels of education and better financial conditions have higher rates. of adherence, while those in vulnerable situations face difficulties.



related to misinformation, logistical barriers and low service coverage (Santos et al., 2022).

Therefore, the level of knowledge about mammography and the perception of its importance directly impacts participation in screening and, consequently, the early diagnosis of the disease (Pfizer, 2022). Additionally, misconceptions persist among the female population is concerned about preventive measures. Research indicates that many women still consider breast self-examination as the main method of early detection, although its purpose is body self-awareness and not a replacement for mammography (Agency Brazil, 2022).

A national survey found that 60% of women believed that the self-examination would be sufficient, and almost half considered periodic examinations unnecessary. Mammography in the absence of symptoms, contrary to clinical recommendations. Recent data also point out that 31% of Brazilian women between the ages of 18 and 70 are not well-informed about the disease, especially among those with lower education and income, and that only 23.4% of the target audience takes the exam, a rate far below the minimum of 70% recommended by the World Health Organization (Natura Institute, 2024).

This reality highlights that, although campaigns like Pink October contribute to raise awareness and increase the number of tests performed, challenges still persist. significant gaps in knowledge and prevention practices, especially among most vulnerable groups (Silva et al., 2022; Costa et al., 2023). According to the Research National Health (2021) and recent studies from institutions such as Datafolha (2023), a significant portion of women over 40 have never had a mammogram, especially in the North and Central-West regions, among the lower-income population groups.

Given this scenario, it becomes essential to understand the factors that influence knowledge and prevention practices in different social contexts. The environment university, by bringing together students, teachers and staff of different ages and levels of education and experiences in accessing health services constitute a relevant space for to investigate such aspects. Thus, this study aims to assess the level of knowledge and mammography-related prevention practices among the academic community of a private higher education institution, considering sociodemographic variables and factors Associates.

2. Materials and Methods

This is a quantitative, cross-sectional, and analytical study whose objective was to investigate the level of knowledge and prevention practices related to mammography in the academic community of a private higher education institution. The research was conducted through the application of a questionnaire developed by the authors themselves, made available online through the Google Forms platform.

The sample was non-probabilistic, of the convenience type, including all women who met the inclusion criteria and agreed to participate within the established period. Those who met the inclusion criteria and agreed to participate within the established period were included. Women aged 18 or older, regularly enrolled in or exercising their profession at the institution, where individuals sign the Informed Consent Form (ICF). These were cases with incomplete or inconsistent completion of the form were excluded from the research. Questionnaire and participants who drop out at any time.

The instrument included sociodemographic and knowledge level information about mammography, including the recommended age to start, the frequency of the exam, its purpose, risk factors, warning signs, and possible myths related to the topic. Regarding preventive practices, the questionnaire investigated mammogram screening, age of onset, and frequency of the examination, in addition to performing clinical breast exams and self-exams, as well as the main motivators and perceived barriers to adherence to screening.

The responses obtained were stored in an anonymized electronic database, with encoding used to ensure the confidentiality of the participants. Quality control was guaranteed by double-blind individuals typing and checking the questionnaires in printed form. The analysis of the information was carried out through descriptive statistics, with calculation of absolute and relative frequencies for variables, categorical measures and measures of central tendency and dispersion (mean and standard deviation, or median and range, interquartile range, according to the distribution of the data) for numerical variables.

The study was approved by the Research Ethics Committee of UniCesumar, in accordance with Resolution No. 466/2012 of the National Health Council. All participants signed the Informed Consent Form before answering the questionnaire, guaranteeing anonymity, confidentiality of information, and... Voluntariness and the right to withdraw at any time, without any prejudice.

3. Results and Discussion

The survey included 55 respondents, all of whom were female, belonging to the academic community of the institution being researched. The questionnaire began with questions designed to characterize the sociodemographic profile of the participants (Table 1).

Table 1 - Sociodemographic profile of the participants.

Faixa etária	18 a 24 anos	25 a 34 anos	35 a 44 anos	45 a 54 anos
n (%)	72,7%	9,1%	14,5%	3,6%
Nível de escolaridade	Ensino médio	Graduação incompleta	Graduação completa	Pós-graduação
n (%)	7,3%	63,6%	14,5%	14,5%
Histórico de câncer de mama	Possui		Não possui	
n (%)	12,7%		87,3%	

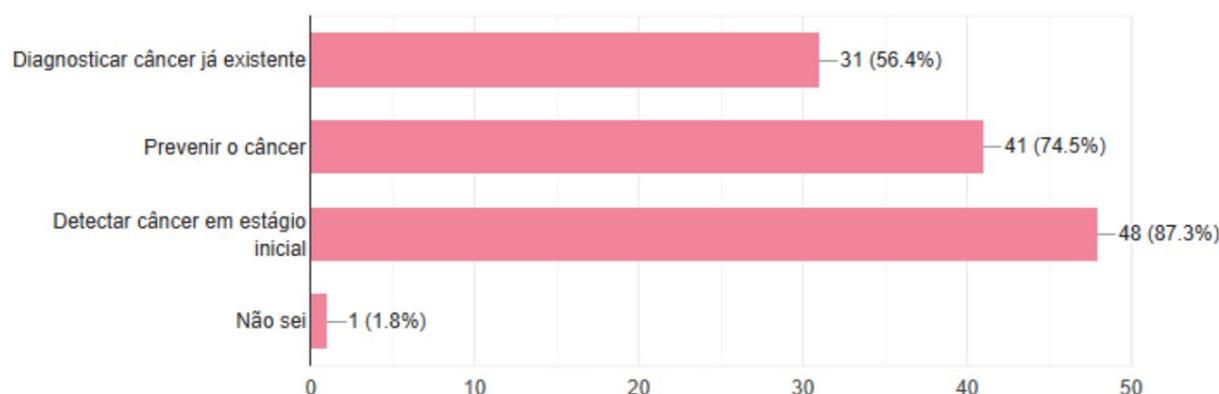
Source: Own authorship

It is observed that the majority of participants belong to the 18 to 24 age group (72.7%). The predominant group consisted of female academics with incomplete undergraduate studies (63.6%), followed by women with high school (7.3%), completed undergraduate degree (14.5%), and postgraduate degree (14.5%). Only 12.7% They reported having a personal or family history of breast cancer.

With regard to knowledge about the recommended age and frequency for Regarding the performance of mammograms, it was found that 65.5% believe that the exam should be done annually. 20% responded that it should be carried out every two years, 12.7% stated they did not know, and 1.8% They indicated a five-year interval. This data highlights variations in perception about the Breast cancer screening recommendations.

Regarding the purpose of mammography, the multiple-choice responses indicated that the Most participants recognize the examination as a tool for the early detection of abnormalities. suspected breast lesions, followed by their use for diagnostic confirmation in suspected cases and Assessment of breast health status during routine examinations (Graph 1).

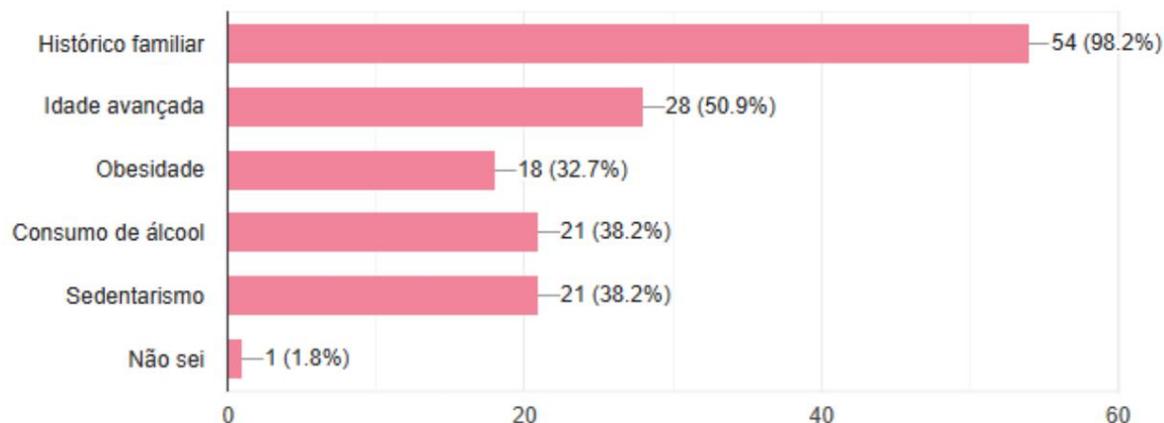
Graph 1 - Purpose attributed to mammography by participants



Source: Own authorship

Regarding knowledge about risk factors associated with breast cancer, the options
The most frequently cited risk factors were family history of the disease, use of hormonal contraceptives, and age.
Advanced age and sedentary lifestyle. Factors such as alcohol consumption, obesity, and early menarche also contribute.
They were mentioned, but less frequently (Graph 2)

Graph 2 - Risk factors for breast cancer recognized by the participants.



Source: Own authorship

Regarding perceptions about breast self-examination, it was observed that 70.9% of...
Participants acknowledge that the method is not sufficient for the early diagnosis of cancer.
breast cancer, while 23.6% believe that self-examination is an adequate form of detection, and 5.5%
They stated they did not know. This result indicates that, although most understand the limitation of
Although there is a segment of participants who consider self-examination effective as a method in isolation, there is still a percentage of participants who consider it effective.

Regarding prevention practices, the responses showed that 34.5% of women already...

65.5% of those who had undergone mammograms have had a mammogram, while 65.5% have never had the exam. Among those who have had one,
50% said they do it annually, 30% every two years, and 20% only when they present [a test].

Regarding breast self-examination, 30.9% perform the procedure regularly.

43.6% do so occasionally, and 25.5% reported not doing so (Table 2).

Table 2 - Breast cancer prevention practices

Variable	Category	n (%)
Performing mammograms	Yes	34.5%
	No	65.5%
Frequency of occurrence*	Once a year	50%
	Every two years	30%
	Only when there are symptoms.	20%
Breast self-examination	Yes, regularly	30.9%
	Yes, occasionally.	43.6%
	It does not perform.	25.5%
Motivators for preventive exams	Awareness campaigns	47.3%
	Medical recommendations	76.4%
	Family history	56.4%
	Personal concern for health	85.5%
	Regular medical check-ups	1.8%
	She never had preventative checkups.	1.8%

Source: Own authorship

When asked about the main barriers to accessing mammograms and other tests

Regarding preventive exams, the most frequently mentioned responses included fear of diagnosis and lack of time.

Discomfort during the examination and difficulty accessing health services (Graph 3).

Chart 3 - Reported barriers to not undergoing mammography and preventive examinations



Source: Own authorship

Regarding perceptions about the level of information regarding breast cancer and mammography, 61.8% of participants stated they had partial knowledge, and 30.9% stated they were well-versed.

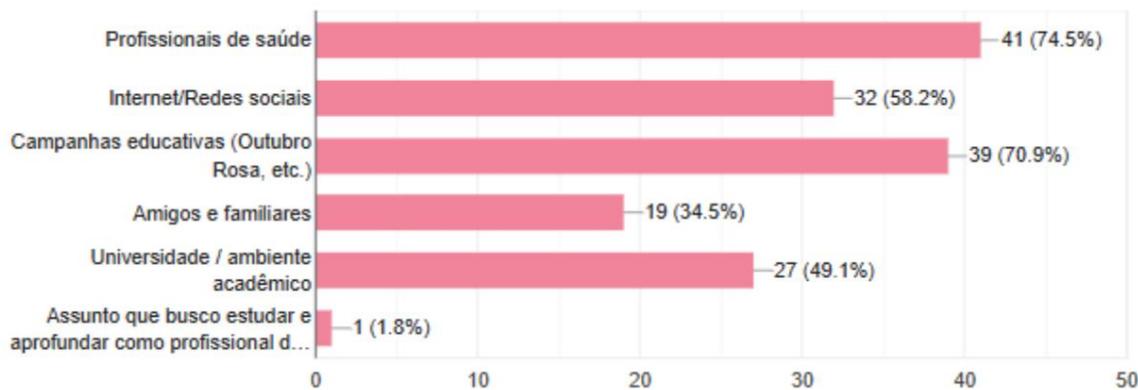
7.3% reported having sufficient information on the subject, and 7.3% reported not having enough information on the topic.

Finally, regarding the main sources of information on mammography and breast cancer prevention...

Regarding breast cancer, the most frequently cited strategies were awareness campaigns, digital media, and professionals. health and institutional materials, in a smaller proportion (Graph 4).

Chart 4 - Main sources of information on mammography and cancer prevention

mama



Source: Own authorship

The sociodemographic profile of the sample is a determining factor for the Interpretation of the results. The research was predominantly composed of young women, with 72.7% of respondents were in the 18-24 age range. This age concentration indicates that the vast majority of participants are not yet within the recommended age range for the Population-based mammographic screening, established by the Ministry of Health and the Institute. National Cancer Institute (INCA) targets women aged 50 to 69. Due to this profile, the low rate of adherence to The observed mammogram result (65.5% stated they had never had the exam) is an expected outcome and clinically consistent, reflecting the absence of a formal indication for screening in this age group and not a failure in preventive practices (Brazil, 2023; INCA, 2022).

It was found that 65.5% of participants believe that mammography should be performed annually, a result that demonstrates a certain level of knowledge about medical recommendations. but it also reveals conceptual confusion between periodicity and the age range at which screening should begin. Similar studies, such as that of Oliveira et al. (2022), have also identified inconsistencies in Responses from university students suggest that theoretical knowledge does not always translate into practice. adequate preventive measures. This predominance of the "annual" response reveals a conceptual confusion. widespread, possibly resulting from the coexistence of different guidelines in the Brazilian context.



While public health policies, represented by INCA and the Ministry of Health authorities recommend biennial screening for women aged 50 to 69, according to medical societies and Private clinics, such as the Brazilian Society of Mastology (SBM), suggest annual screening from the age of 40 (SBM, 2023). This opposition generates uncertainty among professionals and users of health system. Thus, the fact that most of the academic community adopts the annual periodicity for mammography indicates that knowledge about the differences between public policies and the Individualized medical practices are still insufficient.

According to the Ministry of Health (Brazil, 2023) and INCA (2022), the annual implementation of Mammograms should be reserved for high-risk women, such as those with a family history of mammograms. significant or predisposing genetic mutations (BRCA1 and BRCA2). Indiscriminate application This periodicity can negatively impact the allocation of public resources and increase the... occurrence of false-positive results, leading to anxiety and unnecessary interventions (Who, 2023). Thus, the educational challenge lies in ensuring that the target population begins screening at the appropriate age and understand the rationale for the recommended frequency, strengthening Informed adherence to official guidelines.

Another relevant aspect relates to perceptions about breast self-examination (BSE). The majority of participants (70.6%) acknowledged that the method is not sufficient for diagnosis. Early detection of breast cancer, aligning with current guidelines from the Ministry of Health, which does not... recommends it as an isolated method of tracking. According to the Brazilian Federation of Brazilian Associations of Gynecology and Obstetrics (FebRASGO, 2024) and the World Health Organization (WHO, (2023), the goal of self-examination should be body self-awareness, allowing women Recognize suspicious changes and seek early medical evaluation. The persistence of this Misinformation, even among highly educated groups, reinforces the need for education. Permanent focus on health and the importance of valuing reliable scientific sources in the academic environment.

When questioned about their level of information regarding breast cancer and... mammography, more than half (60.3%) stated that they had only partial knowledge. self-perception is consistent with the finding of Santos et al. (2023), according to which the internet and networks Social media are the most widely used sources of information, but they are not always reliable.

Analysis of the open-ended questions confirmed this trend: participants cited "Internet/social networks" and "educational campaigns" as the main means of obtaining information. This dependence on digital media highlights the need to improve the strategies for communicating science, making them more accessible, visual, and evidence-based. (Souza et al., 2023; Who, 2024).

Among the risk factors most recognized by the participants, the following stood out: history Family history and advanced age were the most common risk factors, followed by mentions of obesity and sedentary lifestyle. These findings... These are consistent with the literature, which identifies such factors as classic determinants for the development of the disease (INCA, 2024; Silva et al., 2023). However, few participants They mentioned prolonged use of hormones or alcohol consumption, revealing knowledge. partial analysis of the multiple determinants of the disease.

Modifiable risk factors, such as poor diet, physical inactivity and alcohol consumption showed reduced recognition: only 32.7% cited obesity and 38.2% mentioned alcohol consumption and a sedentary lifestyle. Considering that the sample is composed predominantly women outside the age range recommended for screening, the emphasis should be to focus on primary prevention, centered on healthy habits that reduce the incidence of the disease. (CISA, 2024; Who, 2023).

Studies indicate that alcohol consumption, even in moderate amounts, increases the risk of breast cancer up to 15%, which can triple with prolonged use associated with Hormone therapy (CISA, 2024). The underestimation of these factors reinforces the hypothesis that the Public campaigns have emphasized secondary screening (mammography) to the detriment of Primary prevention, which involves sustainable behavioral changes.

Conversely, the main motivators for undergoing preventive examinations were Family history, personal concern for health, and awareness campaigns. especially Pink October. These results corroborate findings by Ferreira et al. (2021) and Mendes et al. (2022), who highlight the positive impact of public campaigns on mammography adherence. and to actively seeking information.

On the other hand, the main hindering factors reported were fear of the diagnosis, Pain during the exam, the cost, and lack of time. These barriers reflect emotional and... Socioeconomic factors. Fear and anxiety remain among the biggest barriers to early detection. (Souza & Carvalho, 2022; Andrade et al., 2023), while cost and logistics limit access, even among women with higher education or belonging to private institutions.

Analyzing the information sources used by the participants is essential for to understand the origin of cognitive gaps. The study revealed that the majority (61.8%) have only partial knowledge about mammography and breast cancer, and its main sources are the Internet/social media and educational campaigns. Dependence on digital media represents a This is a growing challenge, as these platforms, while widely accessible, are also disseminators of... Fake news in health, which can compromise trust in medical recommendations (Paiva et al., 2024).

Traditional campaigns, such as Pink October, while effective in raising awareness and social mobilization, however, still presents limitations regarding technical depth and approach. continuous pedagogical instruction. In highly educated populations, such as the one studied, it is essential that... educational institutions should take an active role in scientific literacy in health, promoting reliable, short, visual digital content with accessible language to combat the misinformation (Who, 2024; SBM, 2023).

In general, the data analysis shows that, although the academic community While a reasonable level of knowledge about mammography and prevention is present, gaps persist. informational, emotional, and behavioral. The existence of these discrepancies reinforces the The need for continuous and systematic educational interventions, integrated into the environment. university students, who go beyond one-off campaigns and consolidate a culture of prevention. informed and critical.

Final Considerations

The results obtained in this study show that, although the majority of participants While some degree of knowledge about mammography and breast cancer persists... Significant gaps and contradictions in preventive practices, in the understanding of periodicity. recommended, and especially in recognizing modifiable risk factors.

The predominance of young women among the respondents demonstrates that the target audience The majority of university students are outside the age range recommended for screening. mammography, however, highlights that this group plays a fundamental role in the dissemination of information and in the formation of future preventive habits, since the knowledge acquired Changes during academic training tend to be reflected in self-care behaviors and in Positive influence on families and communities.

It was also found that emotional and practical factors, such as fear of the diagnosis, Discomfort during the exam, cost, and lack of time are among the main barriers to undergoing the procedure. from mammography, revealing that the obstacles to prevention go beyond the informational dimension. These findings indicate the need for intervention strategies that also consider aspects socioeconomic, emotional, and cultural factors, promoting comprehensive women's health care.

Another relevant point identified was the predominance of the internet and social networks as primary sources of information about breast cancer. This evidence reinforces the importance of to use these means as strategic tools for digital health education, expanding the expanding the reach of awareness campaigns and promoting access to content based on



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scientific evidence. Media and scientific literacy therefore becomes a component essential for combating misinformation and strengthening women's autonomy in with regard to decisions about your health.

Finally, it is suggested that future investigations broaden the sample scope, including different educational institutions and regional contexts, in order to allow for more comparative analyses. comprehensive and to support the development of personalized and effective educational strategies, aimed at improving knowledge and adherence to preventive practices in women's health.

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