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Overview of Risk Factors for Breast Cancer, Knowledge, and Utilization of Clinical Breast Examination (SADANIS) in Women of Childbearing Age at the Kenali Besar Health Center, Jambi City

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ABSTRACT

Early detection remains a priority in breast cancer control; however, the utilization of clinical breast examination (Pemeriksaan Payudara Klinis, SADANIS) remains limited in Jambi Province, Indonesia. Local epidemiological data are essential for informing targeted health education and community-based screening programs. This study aimed to describe selected breast cancer risk factors, knowledge levels, and SADANIS utilization among women of reproductive age attending the Kenali Besar Community Health Center in Jambi City. A descriptive cross-sectional study was conducted involving 110 women aged 15–49 years who were recruited through convenience sampling. Data were collected using a structured questionnaire and anthropometric measurements. SADANIS utilization was defined as self-reported receipt of at least one clinical breast examination performed by a healthcare professional within the preceding 12 months. Data were analyzed descriptively using frequencies and percentages. Most respondents reported no family history of breast cancer (90.9%), experienced menarche at age 12 years or older (80.0%), and had a body mass index (BMI) below 25 kg/m² (65.5%). Although 62.7% of respondents demonstrated good knowledge of breast cancer and its early detection, only 7.3% reported undergoing SADANIS within the previous year. These findings revealed a descriptive gap between breast cancer knowledge and recent clinical breast examination utilization among the surveyed women, highlighting the need to investigate potential barriers to screening. The study concluded that adequate knowledge was relatively common among respondents, whereas recent SADANIS utilization remained low. Further community-based research should examine factors associated with clinical breast examination uptake, including healthcare accessibility, awareness of available services, perceived susceptibility, and sociocultural barriers, to inform strategies for improving early breast cancer detection.

INTRODUCTION

Breast cancer is the most frequently diagnosed cancer among women worldwide and remains a major public health concern. In 2022, approximately 2.3 million new cases and 670,000 breast cancer-related deaths were estimated globally. If current trends continue, the annual number of new cases is projected to reach approximately 3.2 million, with 1.1 million deaths by 2050. In Indonesia, GLOBOCAN 2022 estimated 66,271 new breast cancer cases, accounting for approximately 30.1% of all cancers diagnosed among women, and 22,598 associated deaths (International Agency for Research on Cancer, 2024, 2025).

Early breast cancer detection coverage at the regional level remains inadequate. According to the 2024 Jambi Province Health Profile, only 17.71% of the 90,715 women aged

30–50 years targeted by the screening program underwent clinical breast examination (Pemeriksaan Payudara Klinis, SADANIS). Furthermore, more than 70% of patients with breast cancer reportedly presented to healthcare facilities at an advanced stage. These findings highlight persistent challenges in early detection and the need to strengthen community awareness and access to screening services (Dinas Kesehatan Provinsi Jambi, 2025).

Women of reproductive age, generally defined in this study as those aged 15–49 years, represent an important population for breast health education and risk assessment (Cai et al., 2025). Prolonged exposure to endogenous estrogen is associated with breast cancer risk because estrogen influences the proliferation of breast epithelial cells. Established risk factors include increasing age, early menarche, nulliparity, breastfeeding history, certain hormonal contraceptive exposures, obesity, family history, and inherited genetic susceptibility. The distribution and significance of these factors vary according to individual characteristics and reproductive history. Although breast cancer incidence generally increases with age, the occurrence of the disease among younger women underscores the importance of breast health awareness and timely evaluation of suspicious symptoms during the reproductive years. Understanding the distribution of selected risk characteristics may therefore support the development of appropriate educational and early detection strategies (Admoun & Mayrovitz, 2022; Al-Shami et al., 2023; Fernandes et al., 2023; Maurya & Brahmachari, 2023; Xu & Xu, 2023).

The World Health Organization's Global Breast Cancer Initiative (GBCI) aims to increase the proportion of breast cancers diagnosed at stages I and II to at least 60%. Clinical breast examination, locally known as SADANIS, involves a systematic assessment of the breasts by a trained healthcare professional to identify palpable masses or other potentially abnormal findings. In primary healthcare settings, particularly where access to diagnostic imaging is limited, clinical breast examination may contribute to breast health assessment and facilitate referral for further diagnostic evaluation when abnormalities are identified. However, its effectiveness as a population-based screening intervention remains uncertain, and it should not be considered a direct substitute for mammography where guideline-recommended screening is available. Despite the availability of SADANIS services within Indonesia's primary healthcare system, examination uptake remains limited in several regions (Abebe Gebreegziabher et al., 2024; Afaya et al., 2025; American Cancer Society, 2023; Solikhah et al., 2021; World Health Organization, 2023).

Previous studies have identified gaps between women's knowledge of breast cancer and their participation in early detection practices. Research conducted by Alam et al. (2021) in Bangladesh and Icanervilia et al. (2023) in Indonesia highlighted inadequate knowledge and awareness as potential barriers to timely breast cancer detection. Community health centers (Pusat Kesehatan Masyarakat, Puskesmas) play an important role in providing preventive healthcare, health promotion, and referrals for further examination. Nevertheless, local evidence concerning the distribution of breast cancer risk characteristics, knowledge levels, and SADANIS utilization among women of reproductive age remains limited, particularly within individual community health center catchment areas (Alam et al., 2021; Icanervilia et al., 2023; Peraturan Menteri Kesehatan Republik Indonesia Nomor 19 Tahun 2024, 2024).

Kenali Besar Community Health Center in Jambi City was selected as the research setting because it had the largest target population of women of reproductive age among the

city's community health centers, comprising 17,573 women according to the 2025 program target data. This population provided a relevant setting for examining breast cancer risk characteristics, knowledge, and recent SADANIS utilization among women accessing primary healthcare services.

The research gap concerned the limited availability of health center-level evidence on clinical breast examination utilization and related characteristics. Provincial health records provided information on program coverage among women aged 30–50 years but offered insufficient detail regarding breast cancer knowledge, selected risk characteristics, and recent examination history among women attending Kenali Besar Community Health Center. Furthermore, this study included women aged 15–49 years, a population that differed from the provincial screening program's target age range. Consequently, the study's estimates of self-reported SADANIS utilization could not be directly equated with provincial program coverage. These differences highlighted the need for locally contextualized data to complement existing administrative statistics.

Addressing this evidence gap was particularly relevant given the low reported provincial examination coverage and variations in preventive healthcare utilization across districts and municipalities. Community health center personnel require locally relevant information to identify priority topics for health education, including breast cancer warning signs, the purpose of clinical breast examination, and appropriate pathways for accessing diagnostic assessment. Examining SADANIS utilization among women already attending primary healthcare facilities may also provide preliminary insights into the relationship between healthcare contact and preventive service use. However, further investigation is necessary to identify the individual, social, and healthcare system factors influencing examination uptake.

The distinctive contribution of this study was its simultaneous examination of selected breast cancer risk characteristics, knowledge levels, and recent SADANIS utilization within a single primary healthcare sample. By documenting family history of breast cancer, age at menarche, and body mass index (BMI) alongside knowledge and examination history, the study provided a descriptive profile of women attending Kenali Besar Community Health Center. Examining these characteristics together also enabled a comparison of the proportions of respondents with adequate knowledge and those reporting recent clinical breast examination. The findings were intended to establish a preliminary descriptive baseline rather than determine causal relationships or identify statistically significant predictors of screening behavior.

This study aimed to describe selected breast cancer risk characteristics, knowledge of breast cancer and SADANIS, and SADANIS utilization among women aged 15–49 years attending Kenali Besar Community Health Center in Jambi City. Specifically, the study sought to characterize respondents' demographic and selected risk profiles, including family history of breast cancer, age at menarche, and BMI; assess their knowledge of breast cancer risk factors, signs and symptoms, and the purpose of clinical breast examination; and determine the proportion who reported undergoing SADANIS performed by a healthcare professional within the preceding 12 months.

The findings were expected to provide practical information for strengthening breast cancer education and early detection services at Kenali Besar Community Health Center. The descriptive results could inform the development of targeted educational materials, improve

communication regarding the availability and purpose of clinical breast examinations, and support the planning of community outreach activities. For local health program managers, the study provided baseline information for subsequent assessments using comparable sampling and measurement procedures. For researchers, the findings could guide future investigations involving larger, more representative community samples, including women with limited access to primary healthcare services. Such studies should examine the relationships among breast cancer knowledge, perceived risk, healthcare accessibility, service availability, and clinical breast examination utilization to identify potential barriers and inform evidence-based strategies for improving early detection.

METHOD

This study employed a quantitative observational design with a cross-sectional approach and was conducted at Kenali Besar Community Health Center, Jambi City, Indonesia, from August to September 2026.

The study population comprised 17,573 women of reproductive age (15–49 years) residing within the catchment area of Kenali Besar Community Health Center. The sample size was estimated using Slovin's formula with a 10% margin of error, yielding 99.43 respondents, which was rounded up to 100. An additional 10% was included to account for potentially incomplete responses, resulting in a final sample of 110 respondents. Participants were recruited through convenience sampling among eligible women attending the health center during the study period. The inclusion criteria were being 15–49 years old, residing within the health center's catchment area, providing written informed consent, and being able to communicate and complete the questionnaire. Women previously diagnosed with breast cancer, those with severe health conditions preventing participation, and those who submitted incomplete questionnaires were excluded.

The study examined selected breast cancer risk characteristics, knowledge, and utilization of clinical breast examination (Pemeriksaan Payudara Klinis, SADANIS). The assessed characteristics included age (≥35 or <35 years), marital status (married or unmarried), educational attainment (elementary school, junior high school, senior high school, or higher education), family history of breast cancer among blood relatives (present or absent), age at menarche (<12 or ≥12 years), and body mass index (BMI; ≥25 or <25 kg/m²). Body weight was measured using a weighing scale, while height was measured using a microtoise height-measuring device. Knowledge was assessed using 20 true-or-false statements covering the purpose of SADANIS, breast cancer signs and symptoms, and associated risk factors. Correct responses were scored as 1 and incorrect responses as 0. Knowledge scores were subsequently categorized as good (at or above the median) or poor (below the median). SADANIS utilization was defined as self-reported receipt of at least one clinical breast examination performed by a healthcare professional within the preceding 12 months and was categorized as yes or no.

The knowledge questionnaire was pilot-tested among 20 women of reproductive age attending Simpang IV Sipin Community Health Center who were not included in the main study. Item validity was assessed using Pearson's product–moment correlation, with a critical correlation coefficient of 0.444 for the pilot sample. All items met the specified validity criterion, with correlation coefficients ranging from 0.445 to 0.490. Internal consistency

reliability was evaluated using Cronbach's alpha, which yielded a coefficient of 0.797, exceeding the predefined threshold of 0.70.

Data were collected directly by the researchers after eligible participants received information about the study and provided written informed consent. Data processing included editing, coding, entry, tabulation, and cleaning using IBM SPSS Statistics, version 32. Descriptive analysis was performed using frequency distributions and percentages. Ethical approval was obtained from the Research Ethics Committee of the Faculty of Medicine and Health Sciences, University of Jambi. Participants' confidentiality was maintained by excluding personally identifiable information from the questionnaires and research reports.

RESULTS AND DISCUSSION

Characteristics of respondents

A total of 110 WUS met the research criteria. Most of the respondents were less than 35 years old (68.2%), married (62.7%), and had a high school education (52.7%). Respondents had a college education as much as 30.9%, while those with elementary and junior high school education were 4.5% and 11.8% respectively (Table 1).

Table 1. Characteristics of respondents (n=110)

Characteristics	n	%
Age (years)		
<35	75	68,2
≥ 35	35	31,8
Marital Status		
Unmarried	41	37,3
Married	69	62,7
Final education		
SD	5	4,5
Junior High School	13	11,8
High School	58	52,7
Colleges	34	30,9

Predisposition, knowledge, and utilization factors of SADANIS

The majority of respondents had no family history of breast cancer (90.9%), experienced menarche at the age of ≥12 years (80.0%), and had a BMI of <25 kg/m² (65.5%). A total of 62.7% of respondents were well informed, but only 7.3% (8 respondents) reported having SADANIS in the past year (Table 2).

Table 2. Distribution of predisposition, knowledge, and utilization factors of SADANIS (n=110)

Variable	Categories	n	%
Family history of breast cancer	There	10	9,1
	None	100	90,9
Age menarche	<12 years old	22	20,0
	≥12 years old	88	80,0
Hormonal contraceptives	≥5 years	25	22,7
	<5 years / never	85	77,3
Body mass index (BMI)	<25 kg/m²	72	65,5
	≥ 25 kg/m²	38	34,5
Knowledge	Good (≥ median)	69	62,7
	Less (median <)	41	37,3

Utilization of SADANIS	Doing (≥ 1 time/year)	8	7,3
	Not doing	102	92,7

Utilization of SADANIS

Only 7.3% of respondents had SADANIS in the past year. This figure is lower than most other reports. Solikhah et al. found breast cancer screening coverage of 18.74% in Indonesian women, while analysis of demographic and health survey data in Ghana reported a prevalence of SADANIS of 18.39% in women of reproductive age. Afaya et al. in northern Ghana found 23% of women underwent SADANIS in the past year. Figures closer to our results were reported in Lesotho (9.73%) and Kenya (11.39%). In Côte d'Ivoire the prevalence was 17.4%. Studies in Hanoi and Tehran showed much higher numbers, at 51% among women who had been screened and 52.6%, respectively, but both studies asked about the experience of being screened indefinitely for one year and involving older women (30–74 years in Hanoi), so they could not be directly compared (Abebe Gebreegziabher et al., 2024; Afaya et al., 2023; Afaya et al., 2025; Ali, 2025; Ngan et al., 2022; Okyere et al., 2024; Rabiei et al., 2022; Solikhah et al., 2021).

There are two things that may explain the low numbers in this study. First, the SADANIS program in Jambi Province targets women aged 30–50 years with coverage of 17.71%, while 68.2% of our respondents are <35 years old and some are not included in the program's target. Second, the low coverage is in line with the general picture in low- and middle-income countries, when services are available but not routinely utilized by women of childbearing age (Abebe Gebreegziabher et al., 2024; Afaya et al., 2025; Dinas Kesehatan Provinsi Jambi, 2025).

Age, marital status, and education

Respondents were dominated by the age group <35 years (68.2%). Solikhah et al. reported that the chances of screening were higher in the 35–39 age group, and the Ghanaian data showed a greater chance of SADANIS in the 45–49 years age group (AOR 2.84). An increase in odds by age was also reported in Côte d'Ivoire. With a predominantly young respondent composition, the low utilization of SADANIS in this study is consistent with this pattern, although this study did not examine the relationship between variables (Abebe Gebreegziabher et al., 2024; Okyere et al., 2024; Solikhah et al., 2021).

As many as 62.7% of the respondents were married. Rabiei et al. in Tehran reported differences in marital status between women who had undergone SADANIS and had never undergone SADANIS. In terms of education, 83.6% of respondents had a high school or college education. Education was one of the factors that survived in the multivariate model in the study of Afaya et al. The fact that most of the respondents had secondary to upper education, but only 7.3% underwent SADANIS, shows that the level of education alone is not enough to encourage women to have their breasts checked (Afaya et al., 2025; Rabiei et al., 2022).

Family history of breast cancer

Most of the respondents (90.9%) had no family history of breast cancer, and 9.1% had one. Family history was a known risk factor, but in the study of Afaya et al. the factors that persisted in the multivariate model were education, knowledge, perception of vulnerability, perception of barriers, recommendations from friends and health workers, as well as availability of facilities, and family history were not included. Thus, groups with a family

history still need special attention in counseling, because the risk they have is not necessarily followed by screening behavior (Admoun & Mayrovitz, 2022; Afaya et al., 2025).

Age menarche

Menarche at the age of ≥12 years was experienced by 80.0% of respondents, while 20.0% experienced early menarche (<12 years). Early menarche prolongs the period of exposure to estrogen to breast tissue, making this group one of those at higher risk. Okyere et al. in 14,685 women in Côte d'Ivoire found that women with early menarche were actually less likely to undergo SADANIS (AOR 0.89; 95% IK 0.81–0.99). The findings suggest that groups with early menarche need to be actively reached out to because their risks do not automatically prompt them to self-check (Al-Shami et al., 2023; Maurya & Brahmachari, 2023; Okyere et al., 2024).

Use of hormonal contraceptives

As many as 77.3% of respondents used hormonal contraceptives for less than 5 years or did not use them, while 22.7% had used them for 5 years or more. Prolonged exposure to hormones is associated with an increased risk of breast cancer, and the association between contraceptive use and breast cancer incidence in Indonesia has been studied. Therefore, long-term users need to be one of the targets of SADANIS counseling. On the other hand, Gebreegziabher et al. found that the use of modern contraceptives was associated with a slightly higher chance of SADANIS (AOR 1.12; IK 95% 1.00–1.25). The magnitude of the association was small, and contraceptive users were more likely to be associated with health services. This suggests that family planning service visits can be used as an opportunity to offer SADANIS (Abebe Gebreegziabher et al., 2024; Al-Shami et al., 2023; Maurya & Brahmachari, 2023; Sulfiana et al., 2024).

Body mass index

Most respondents had a BMI of <25 kg/m² (65.5%), and 34.5% had a BMI of ≥25 kg/m², i.e. being overweight or obese. This group is important to note because obesity is a risk factor for breast cancer. Samman et al. found no association between BMI and non-compliance with breast cancer screening (OR 1.01; 95% IK 0.99–1.03), so being overweight does not seem to automatically change screening behavior. It should be noted that the study was conducted on women in the United States aged 50–75 years with mammography screening guidelines, so its fit for our context is limited (Admoun & Mayrovitz, 2022; Samman et al., 2022).

SADANIS Knowledge and Utilization

Good knowledge was found in 62.7% of respondents. This percentage needs to be read carefully because the good category is determined from the median value, so a proportion above 50% is indeed expected and does not indicate high material mastery according to certain standards. However, the gap between the proportion of well-informed respondents (62.7%) and those who did SADANIS (7.3%) was quite striking. The gap between knowledge and practice was also reported by Alam et al. in Bangladesh. In another study, knowledge was associated with greater SADANIS chances, namely OR 2.44 in Hanoi, aOR 1.04 in northern Ghana, and aOR 1.75 in Indonesian women. This study is descriptive so it cannot test the relationship, but the picture obtained shows that sufficient knowledge does not necessarily lead to examination. Obstacles to early detection of breast cancer in Indonesia are not only related to knowledge, but also awareness and other factors that prevent women from seeking services (Afaya et al., 2025; Alam et al., 2021; Icanervilia et al., 2023; Solikhah et al., 2021).

Limitations

This study is descriptive so it does not explain the cause-and-effect relationship between variables. Data comes from self-filled questionnaires so that they are susceptible to memory bias and social desire bias, especially on the question of the use of SADANIS. Accidental sampling at the health center makes not all WUS have the same chance of being selected, and respondents who come to the health center may be closer to health services than WUS in the community, so the results cannot be generalized. The knowledge category is determined from the median value so it is relative.

CONCLUSION

Among the 110 women of reproductive age recruited at Kenali Besar Community Health Center in Jambi City, 62.7% demonstrated good knowledge of breast cancer and clinical breast examination (Pemeriksaan Payudara Klinis, SADANIS), whereas only 7.3% reported undergoing SADANIS within the preceding 12 months. Most respondents reported no family history of breast cancer (90.9%), experienced menarche at age 12 years or older (80.0%), and had a body mass index (BMI) below 25 kg/m² (65.5%). These findings revealed a descriptive gap between breast cancer knowledge and recent clinical breast examination utilization among the surveyed women. However, the cross-sectional descriptive design and convenience sampling method limited the ability to determine whether knowledge was associated with individual examination behavior or to generalize the observed utilization rate to the wider population within the health center's catchment area. Future research should employ community-based probability sampling to include women with limited access to primary healthcare services and obtain more representative estimates of SADANIS utilization. Analytical studies are also recommended to examine potential associations between examination uptake and factors such as breast cancer knowledge, perceived susceptibility, awareness of service availability, healthcare accessibility, and practical barriers to screening. Furthermore, qualitative interviews with women and healthcare professionals could provide deeper insights into reasons for delayed or forgone examinations and inform the development of contextually appropriate educational interventions and service delivery strategies to improve access to and utilization of clinical breast examinations.

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CONFLICT OF INTEREST

The author states that this research was conducted without any commercial or financial relationship that can be interpreted as a potential conflict of interest.

AUTHOR'S CONTRIBUTION

The author fully contributes to the formulation of the main idea idea, collects library data, analyzes and interprets the primary text of the figure, and prepares the manuscript. All authors have agreed on the final version of the manuscript.

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The author states that generative artificial intelligence (AI) was used in the preparation of this manuscript. The author acknowledges the use of generative AI to help improve language clarity and improve the grammatical structure of the manuscript. The use is done in compliance with the applicable ethical guidelines regarding the use and disclosure of generative AI in scientific research. Each author has made substantial intellectual contributions to this work. The entire manuscript content has been carefully reviewed to ensure its accuracy, and the author is solely responsible for the integrity and final content of the manuscript.

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