The Relationship Between Knowledge of Breast Cancer and Breast Self-Examination Behavior Among Women of Reproductive Age in Kupang City, Indonesia

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ABSTRACT

Background: Breast cancer remains the most common cancer and a leading cause of cancer-related mortality among women worldwide, including women of reproductive age. Early detection through Breast Self-Examination (BSE), locally known as SADARI, is a simple and cost-effective method, particularly relevant in low-resource settings. Knowledge about breast cancer is considered a key cognitive factor influencing women's engagement in early detection behaviors.

Objective: This study aimed to determine the relationship between the level of knowledge about breast cancer and Breast Self-Examination behavior among women of reproductive age in Kupang City, Indonesia.

Methods: This study employed an observational analytic design with a cross-sectional approach. The research was conducted in six districts of Kupang City from August to October 2025. The study population consisted of women aged 15–49 years. A total of 100 respondents were selected using proportional random sampling. Data were collected using a validated structured questionnaire measuring breast cancer knowledge and BSE behavior. Data analysis included univariate analysis and bivariate analysis using the Chi-square test, with a significance level set at $\alpha = 0.05$.

Results: Most respondents demonstrated a moderate level of breast cancer knowledge (68.0%), followed by good (27.0%) and poor knowledge (5.0%). The majority of participants reported supportive BSE behavior (70.0%). Statistical analysis revealed a significant association between breast cancer knowledge and BSE behavior (Chi-square test, $p = 0.031$).

Conclusion: There is a statistically significant relationship between breast cancer knowledge and Breast Self-Examination behavior among women of reproductive age in Kupang City. Higher levels of knowledge are associated with a greater likelihood of engaging in early detection practices through BSE. Strengthening educational interventions may improve early detection behaviors and contribute to breast cancer prevention efforts.

KEYWORDS: Breast cancer, Breast self-examination, Knowledge, Women of reproductive age, Kupang City

INTRODUCTION

Breast cancer remains the most frequently diagnosed cancer among women and is a leading cause of cancer-related mortality worldwide. According to the American Cancer Society, breast cancer continues to account for a substantial proportion of new cancer cases each year, with a considerable number occurring in women under the age of 50.[1] In parallel, the World Health Organization has identified breast cancer as a major global public health concern, emphasizing the need for effective prevention and early detection strategies to reduce morbidity and mortality.[2]

In Indonesia, breast cancer represents the most common malignancy among women and contributes significantly to the national cancer burden. Data from the Global Cancer Observatory indicate that breast cancer accounts for approximately one-third of all cancer cases among Indonesian women.[3] National health statistics further confirm that breast cancer remains one of the two most frequently diagnosed cancers in the country.[4] These findings highlight the persistent challenge of breast cancer prevention and control within the Indonesian healthcare system.

At the regional level, breast cancer cases have also been reported in Kupang City, East Nusa Tenggara. Although the absolute number of reported cases is relatively small, these data demonstrate that breast cancer constitutes a real and existing health problem in the local population.[5] The presence of documented cases underscores the importance of strengthening early detection efforts, particularly in areas with limited access to advanced diagnostic facilities.

Despite the recognized importance of early detection, the practice of Breast Self-Examination (BSE), locally referred to as SADARI, remains suboptimal in Indonesia. A meta-analysis of studies conducted between 2017 and 2022 reported that fewer than half of Indonesian women routinely perform BSE.[6] In East Nusa Tenggara Province, the coverage of early detection for breast and cervical cancer is reported to be markedly low, indicating substantial gaps in preventive health behavior.[7] These findings suggest that many women remain at risk of delayed diagnosis and advanced-stage presentation.

Early detection of breast cancer can be achieved through several approaches, including BSE, clinical breast examination (SADANIS), mammography, ultrasonography, and biopsy when indicated.[8] Among these methods, BSE is considered a simple, low-cost, and non-invasive practice that can be performed independently by women. This method is particularly relevant in resource-limited settings, where access to imaging-based screening may be restricted. Although BSE does not replace clinical examination or imaging, it plays an important role in increasing body awareness and encouraging timely medical consultation when abnormalities are detected.[9,10]

The adoption of BSE behavior is influenced by multiple factors, including cognitive and psychosocial determinants. Knowledge about breast cancer has been identified as a critical factor that shapes awareness, attitudes, and preventive practices. Previous studies conducted in Indonesia have demonstrated a significant association between knowledge level and BSE behavior, with women who possess better knowledge being more likely to perform regular BSE.[11,12] These findings support the hypothesis that improving knowledge may contribute to enhanced early detection behavior.

Given the substantial burden of breast cancer, the low prevalence of BSE practice, and the potential role of knowledge as a determinant of preventive behavior, this study aimed to examine the relationship between knowledge about breast cancer and BSE behavior among women of reproductive age (15–49 years) in Kupang City, Indonesia.

METHODS

This study employed an observational analytic design with a cross-sectional approach and was conducted in six districts of Kupang City, East Nusa Tenggara Province, Indonesia, from August to October 2025. The study population comprised women of reproductive age (15–49 years) residing in the study area. A total of 100 respondents were recruited using proportional random sampling to ensure representation from each district. Women aged 15–49 years who resided in Kupang City, agreed to participate, and provided informed consent were included in the study, while those who were unable to complete the questionnaire independently or submitted incomplete responses were excluded. The independent variable was knowledge about breast cancer, defined as respondents' understanding of breast cancer, including its definition, risk factors, signs and symptoms, and the importance of early detection, while the dependent variable was Breast Self-Examination (BSE/SADARI) behavior, defined as self-reported practice of breast self-examination. Data were collected using a validated structured questionnaire consisting of sections on sociodemographic characteristics, breast cancer knowledge, and BSE behavior. Knowledge scores were categorized into poor, moderate, and good levels, whereas BSE behavior was classified as supportive or non-supportive based on predefined scoring criteria. Data collection was conducted by trained personnel after providing participants with information regarding the study objectives and procedures. All respondents completed the questionnaire voluntarily under supervision to minimize missing data. Data were analyzed using the Statistical Package for the Social Sciences (SPSS). Univariate analysis was performed to describe respondent characteristics, knowledge levels, and BSE behavior using frequencies and percentages. The association between breast cancer knowledge and BSE behavior was assessed using the Chi-square test, with statistical significance set at $p < 0.05$. Ethical approval for the study was obtained from the Research Ethics Committee, Faculty of Medicine and Veterinary Medicine, Universitas Nusa Cendana (No. 00494/KEPK FKM UNDANA/2025). Written informed consent was obtained from all participants, and confidentiality and anonymity were maintained throughout the study in accordance with the Declaration of Helsinki.

RESULTS

A total of 100 women of reproductive age participated in this study. The respondents were distributed across six districts in Kupang City and were included in the analysis without missing data. Table 1 presents the distribution of respondents according to their level of knowledge about breast cancer.

Table 1. Distribution of Breast Cancer Knowledge Levels (n = 100)

Knowledge Level	Frequency (n)	Percentage (%)
Poor	5	5.0
Moderate	68	68.0
Good	27	27.0
Total	**100**	**100.0**

The majority of respondents had a moderate level of knowledge about breast cancer (68.0%), while 27.0% demonstrated good knowledge and only a small proportion (5.0%) had poor knowledge. Table 2 shows the distribution of Breast Self-Examination (BSE/SADARI) behavior among the respondents.

Table 2. Distribution of BSE (SADARI) Behavior (n = 100)

BSE Behavior	Frequency (n)	Percentage (%)
Supportive	70	70.0
Non-supportive	30	30.0
Total	**100**	**100.0**

Most respondents reported supportive BSE behavior (70.0%), while 30.0% did not routinely perform or support BSE practices. The association between breast cancer knowledge and BSE behavior was further analyzed using the Chi-square test. The results are presented in Table 3.

Table 3. Association Between Breast Cancer Knowledge and BSE Behavior (n = 100)

Knowledge Level	Supportive BSE n (%)	Non-supportive BSE n (%)	Total	p-value
Poor	2 (40.0)	3 (60.0)	5	
Moderate	45 (66.2)	23 (33.8)	68	**0.031**
Good	23 (85.2)	4 (14.8)	27	
Total	**70**	**30**	**100**	

Statistical analysis demonstrated a significant association between the level of breast cancer knowledge and BSE behavior (Chi-square test, p = 0.031). A higher proportion of supportive BSE behavior was observed among respondents with good knowledge compared to those with moderate or poor knowledge.

DISCUSSION

This study demonstrated a statistically significant association between breast cancer knowledge and Breast Self-Examination (BSE/SADARI) behavior among women of reproductive age in Kupang City. Women with higher levels of knowledge were more likely to report supportive BSE behavior, supporting the hypothesis that cognitive factors play an important role in shaping early detection practices. This finding is consistent with previous Indonesian studies that reported a significant relationship between knowledge level and BSE behavior.[11,12]

From a behavioral science perspective, knowledge is a fundamental prerequisite for the formation of preventive health behavior. Health behavior theories, such as the Health Belief Model, posit that individuals are more likely to adopt preventive actions when

they possess adequate knowledge, perceive personal susceptibility, and understand the benefits of early detection.[13,14] In the context of breast cancer, improved knowledge may enhance women's awareness of early symptoms and reduce misconceptions that often delay health-seeking behavior.[15]

The predominance of respondents with moderate knowledge observed in this study reflects patterns commonly reported in low- and middle-income countries.[3,4] Although basic awareness of breast cancer may be widespread, detailed understanding of risk factors, early warning signs, and appropriate detection methods often remains limited.[16] This partial knowledge may contribute to inconsistent adoption of preventive practices, including irregular or incorrect performance of BSE.

Despite a relatively high proportion of respondents reporting supportive BSE behavior compared with national estimates, a substantial proportion of women in this study still did not engage in regular BSE.[6,7] This discrepancy highlights the well-documented gap between knowledge acquisition and behavioral implementation. Previous studies have shown that factors such as cultural beliefs, fear of cancer diagnosis, perceived stigma, and low self-efficacy may hinder the translation of knowledge into practice.[17,18]

The significant association between knowledge and BSE behavior identified in this study aligns with international evidence indicating that women with higher educational exposure and cancer-related knowledge are more likely to engage in early detection behaviors.[19,20] Educational interventions have been shown to improve not only knowledge scores but also confidence and skills related to BSE performance, particularly when combined with practical demonstrations and community-based reinforcement.[21]

In resource-limited settings such as East Nusa Tenggara, BSE remains a feasible and accessible early detection strategy.[9,10] Although global guidelines emphasize mammography as the gold standard for population-based screening, its availability and affordability remain limited in many developing regions.[22] In such contexts, BSE and clinical breast examination serve as pragmatic complementary strategies that may facilitate earlier presentation and referral.[23]

However, it is important to emphasize that BSE should not be interpreted as a substitute for professional screening or diagnostic evaluation. Overreliance on BSE alone may lead to delayed diagnosis if abnormal findings are ignored or misinterpreted.[24] Therefore, public health programs should position BSE as part of a broader continuum of care that includes clinical examination, imaging, and timely referral when indicated.[22,23]

Several limitations should be considered when interpreting the findings of this study. The cross-sectional design limits the ability to infer causality between knowledge and BSE behavior. Additionally, the use of self-reported data may introduce recall bias or social desirability bias, potentially leading to overestimation of BSE practice.[18] The study was conducted in a single urban setting, which may limit the generalizability of the findings to rural or culturally distinct populations.[25]

Despite these limitations, the study provides valuable evidence supporting the role of knowledge in promoting early detection behavior among women of reproductive age. Strengthening breast cancer education through structured, culturally appropriate health promotion programs may contribute to improved early detection practices and reduced delays in diagnosis, particularly in settings with limited access to advanced screening facilities.[13,19,21]

CONCLUSION

This study demonstrates a statistically significant association between breast cancer knowledge and Breast Self-Examination (BSE/SADARI) behavior among women of reproductive age in Kupang City, Indonesia. Women with higher levels of knowledge were more likely to engage in supportive BSE behavior, indicating that knowledge plays an important role in shaping early detection practices. Although a relatively high proportion of respondents reported supportive BSE behavior, a substantial gap between knowledge and consistent practice remains. These findings highlight the importance of strengthening breast cancer education as part of comprehensive public health strategies. Targeted, culturally appropriate educational interventions may enhance early detection behaviors and contribute to earlier presentation and improved breast cancer outcomes, particularly in resource-limited settings.

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