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Risk of breast cancer among women with a breastfeeding history of less than two years

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Abstract

Background: Breast cancer remains a major public health problem among women, with its incidence continuing to increase each year. Breastfeeding is known to have a protective effect against breast cancer; however, a shorter duration of breastfeeding may reduce this protective benefit and increase the risk of disease development.

Purpose: To determine the risk of breast cancer among women with a history of breastfeeding for less than two years.

Method: An analytical survey with a cross-sectional design was conducted involving 95 respondents selected using probability sampling. Breastfeeding duration was assessed as the independent variable, while breast cancer incidence was the dependent variable. Data were analyzed using the Chi-square test and Prevalence Odds Ratio (POR).

Results: The results demonstrated a statistically significant association between breastfeeding duration and breast cancer incidence ($p\text{-value} = 0.000$). Women who breastfed for less than two years were found to have a 9.20-fold higher risk of developing breast cancer compared to those who breastfed for two years or longer ($\text{POR} = 9.20$; $95\% \text{ CI} = 3.55\text{--}23.89$).

Conclusion: A breastfeeding duration of less than two years is a significant risk factor for breast cancer. Strengthening breastfeeding promotion and support for longer duration may serve as an important preventive strategy against breast cancer among women.

Keywords: Breast Cancer; Breastfeeding Duration; Breastfeeding Status.

INTRODUCTION

Breast cancer is a malignant disease characterized by the uncontrolled growth of abnormal cells in breast tissue, leading to tumor formation. Breast cancer cells commonly originate from the milk ducts (ducts) and/or the milk-producing lobules. In the early stages, breast cancer often presents without obvious symptoms; therefore, many patients are diagnosed at an advanced stage, which adversely affects prognosis and results in higher mortality rates. Globally, the incidence of breast cancer continues to increase each year. The World Health Organization reported that in 2021 there were 2.26 million cases of breast cancer among women, with 685,000 deaths. This number increased to 2.3 million cases in 2022 and reached 2.9 million cases in 2023, making breast

cancer one of the leading health problems among women worldwide (World Health Organization, 2024).

Breast cancer is the most common cancer among women, and men have a 1 in 1000 chance of developing this disease. One in three people worldwide will develop some form of cancer during their lifetime, and for women, it is most likely to be breast cancer. Cancer is one of the leading causes of death worldwide and the biggest cause of death each year (Melda, 2016).

In Indonesia, breast cancer is the most common type of cancer among women. Data from the Ministry of Health of the Republic of Indonesia indicate that in 2021 there were 68,858 cases of breast cancer, with an estimated 22,430 deaths. In 2023, approximately

70,000 new cases were reported, with around 24,000 deaths, positioning breast cancer as the leading cause of cancer-related mortality among women in Indonesia (Ministry of Health of the Republic of Indonesia, 2024).

Findings from the Basic Health Research show fluctuations in breast cancer prevalence in Indonesia, with rates of 4.3 per 1,000 population in 2007, 1.4 per 1,000 population in 2013, and an increase to 1.79 per 1,000 population in 2018. In the Bangka Belitung Islands Province, the prevalence of breast cancer also increased from 0.2% in 2007 to 1.3% in 2013 (Ministry of Health of the Republic of Indonesia, 2018). In 2018 in Indonesia, breast cancer ranked first with 16.7% of new cases and a mortality rate of 11.0%. The highest prevalence of cancer in Indonesia was in West Java Province, with 4.141 residents (Zahra, 2020).

Based on the Indonesian Health Survey (IHS) in 2023, the number of breast cancer cases in Indonesia reached 877.531 cases, accounting for approximately 1.2% of all cancer cases. Breast cancer remains the most prevalent cancer among women, with an incidence rate of 42.1 per 100.000 population and an average mortality rate of 17 per 100.000 population (Ministry of Health of the Republic of Indonesia, 2023).

At the regional level, the incidence of breast cancer in the Bangka Belitung Islands Province shows a significant upward trend. Data from the Provincial Health Office indicate that the number of breast cancer cases increased from 61 cases in 2021 to 98 cases in 2024. In 2024, a total of 13 deaths due to breast cancer were reported across several districts and municipalities in the province (Bangka Belitung Islands Provincial Health Office, 2024).

Dr. (H.C.) Ir. Soekarno Provincial General Hospital in the Bangka Belitung Islands Province serves as the main referral hospital for cancer care, providing radiotherapy and chemotherapy services. Hospital medical records show that the number of breast cancer patients during the period 2022–2025 reached 368 individuals, with a steady annual increase. Breast cancer-related mortality at the hospital also rose, with 2 deaths reported in 2022, 11 in 2023, 20 in 2024, and 27 deaths during the period from January to July 2025 (Dr. (H.C.) Ir. Soekarno Provincial General Hospital, 2025).

Various factors contribute to the development of breast cancer, including both non-modifiable and modifiable risk factors. One modifiable protective factor is breastfeeding. Breastfeeding has been shown to reduce the risk of breast cancer through mechanisms such as decreased exposure to estrogen, maturation of breast cells, and suppression of ovulatory cycles associated with breast cell proliferation (Paratiwi, 2021).

However, suboptimal breastfeeding duration, particularly less than two years, remains common among women. This condition is suspected to reduce the protective effect of breastfeeding against breast cancer, thereby increasing the risk of malignancy. Several previous studies have demonstrated that shorter breastfeeding duration is associated with an increased risk of breast cancer among women (Purwanti & Syukur, 2021).

A preliminary study conducted at the Oncology Polyclinic of Dr. (H.C.) Ir. Soekarno Provincial General Hospital in the Bangka Belitung Islands Province revealed that a proportion of breast cancer patients had a history of suboptimal breastfeeding. These findings highlight the importance of further investigation into the role of breastfeeding duration in breast cancer occurrence.

RESEARCH METHOD

This study employed a quantitative research design with an analytical survey using a cross-sectional approach to examine the association between risk factors and the incidence of breast cancer among women. The study was conducted at Dr. (H.C.) Ir. Soekarno Provincial General Hospital, Bangka Belitung Islands Province, from August to September 2025, using data covering the period 2022–2025.

The study population consisted of all women diagnosed with breast cancer at Dr. (H.C.) Ir. Soekarno Provincial General Hospital during the study period, totaling 368 individuals. A sample of 95 respondents was selected using probability sampling with a cluster sampling method. The dependent variable was the incidence of breast cancer, while the independent variables included maternal age, family history, history of hormonal contraceptive use, and breastfeeding status. Secondary data were obtained from hospital medical records and collected using a checklist.

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Data analysis was performed using univariate and bivariate analyses with the Chi-square test, with a significance level set at $p < 0.05$. The results were presented as Prevalence Odds Ratios (POR) and

95% Confidence Intervals (CI). Ethical approval was obtained from the relevant institutions, and respondent confidentiality was strictly maintained.

RESEARCH RESULTS

Table the Association Between Breastfeeding Duration and Breast Cancer Incidence Among Women

Variable	Breast Cancer n (%)	No Breast Cancer n (%)	P-value	POR (95% CI)
Breastfeeding Duration				
< 2 years	46/82.2)	23/33.3)	0.000	9.20 (3.55–23.89)
≥ 2 years	21/17.8)	26/66.7)		

Table shows the association between breastfeeding duration and breast cancer incidence among women. The majority of breast cancer cases were found among women who breastfed for less than two years (82.2%). In contrast, women who breastfed for two years or longer were more likely to be in the non-breast cancer group (66.7%). The Chi-square analysis demonstrated a statistically significant association between breastfeeding duration and breast cancer incidence ($p = 0.000$). Women with a breastfeeding duration of less than two years had a 9.20 times higher risk of developing breast cancer compared to those who breastfed for two years or longer (POR = 9.20; 95% CI: 3.55–23.89)

DISCUSSION

This study demonstrated a statistically significant association between breastfeeding duration and breast cancer incidence among women. Women who breastfed for less than two years had a substantially higher risk of developing breast cancer compared to those who breastfed for two years or longer. The magnitude of risk observed in this study indicates that breastfeeding duration plays an important protective role against breast cancer (Collaborative Group on Hormonal Factors in Breast Cancer, 2002; World Health Organization, 2023).

The protective effect of breastfeeding against breast cancer can be explained through several biological mechanisms. During lactation, ovarian activity is suppressed, leading to reduced lifetime exposure to estrogen. Lower estrogen levels decrease the stimulation of breast epithelial cell proliferation, which in turn reduces the likelihood of malignant transformation. In addition, breastfeeding promotes terminal differentiation and maturation of breast cells, making them less susceptible to carcinogenic changes (Bernier, Plu-Bureau, Bossard, Ayzac, & Thalabard, 2000; Colditz & Bohlke, 2014).

Previous studies have shown that 59% of women breastfeed for less than 1 year, and 67% use contraception for more than 5 years. Chi-square analysis of breast cancer risk factors in women related to breastfeeding history ($p = 0.000$) and contraceptive use ($p = 0.030$) showed a relationship between breastfeeding history and contraceptive use and the incidence of breast cancer. It was concluded that there is a relationship between breastfeeding history and contraceptive use and the incidence of breast cancer (Sari, Morika, & Nur, 2021).

Another proposed mechanism is the mechanical shedding of breast tissue during lactation, which may help eliminate cells with potential DNA damage. Furthermore, prolonged breastfeeding delays the return of regular ovulatory cycles, thereby shortening the cumulative hormonal exposure that is known to contribute to breast carcinogenesis. Women who breastfeed for shorter durations may not obtain these protective hormonal and cellular effects, resulting in a higher risk of breast cancer (Rosenberg, Palmer, Bethea, Ban, Kipping-Ruane, & Adams-Campbell, 2014; Islami et al., 2015).

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The findings of this study are consistent with previous research reporting that longer cumulative breastfeeding duration is associated with a reduced risk of breast cancer. Several studies have shown that women who breastfeed for longer periods experience a proportional decrease in breast cancer risk, with each additional year of breastfeeding contributing to further risk reduction. Conversely, limited or short-term breastfeeding has been associated with a diminished protective effect (Collaborative Group on Hormonal Factors in Breast Cancer, 2002; Victora, Bahl, Barros, França, Horton, Krasevec, & Rollins, 2016).

From a public health perspective, the results highlight the importance of promoting and supporting breastfeeding for at least two years, as recommended by international health organizations. Barriers such as limited maternity leave, work-related constraints, and insufficient family or healthcare support may contribute to shorter breastfeeding duration. Addressing these barriers through supportive policies and breastfeeding-friendly environments may help reduce breast cancer risk among women (World Health Organization, 2023; Rollins, Bhandari, N., Hajeerbhoy, Horton, Lutter, Martines, & Victora, 2016).

This study has several limitations that should be considered. The cross-sectional design does not allow for causal inference, and breastfeeding history was obtained from medical records, which may not fully capture cumulative lifetime breastfeeding duration. Nevertheless, the strength of association observed suggests that breastfeeding duration remains an important factor in breast cancer prevention (Setiawan, Monroe, Wilkens, Kolonel, Pike, & Henderson, 2009).

In conclusion, the findings of this study reinforce existing evidence that breastfeeding for less than two years is associated with an increased risk of breast cancer. Strengthening breastfeeding education, support programs, and policies that encourage longer breastfeeding duration may contribute to reducing breast cancer incidence among women (Victora et al., 2016; World Health Organization, 2023). To date, the cause and progression of breast cancer are not yet clearly understood (Fadhila, Karyus, Setiaji, Irianto, Za'im, & Nonasri, 2024).

CONCLUSION

This study concludes that breastfeeding duration is significantly associated with breast cancer incidence among women. Women with a history of breastfeeding for less than two years had a substantially higher risk of developing breast cancer compared to those who breastfed for two years or longer. These findings highlight the protective role of prolonged breastfeeding against breast cancer. Therefore, promoting and supporting breastfeeding for at least two years may serve as an important preventive strategy to reduce breast cancer risk among women. Strengthening breastfeeding education, healthcare support, and breastfeeding-friendly policies is essential to improve breastfeeding duration and contribute to breast cancer prevention efforts.

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