Jurnal Geografi, Lingkungan & Kesehatan
ISSN : 3025 – 9134 (Online)

Faktor-Faktor terkait Kejadian Kanker Payudara pada Rawat Jalan di RSUD Haji Medan Tahun 2025

Factors related to the incidence of Breast Cancer in Outpatient Care at Haji Medan Hospital in 2025

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Abstract

Breast cancer remains a major cause of cancer-related mortality among women worldwide. In 2024, RSU Haji Medan recorded 1,665 outpatient cases. This study aimed to identify factors associated with breast cancer incidence in outpatients at RSU Haji Medan in 2025. A quantitative cross-sectional study was conducted among 114 purposively selected respondents. Data were collected using structured interviews and analyzed through univariate and bivariate methods, presenting odds ratios (OR) with 95% confidence intervals (CI). Significant factors associated with breast cancer incidence included age (OR = 2.15, 95% CI: 1.15–4.03, p = 0.016), family history (OR = 2.85, 95% CI: 1.32–6.13, p = 0.007), early menarche <12 years (OR = 1.98, 95% CI: 1.09–3.62, p = 0.024), breastfeeding <6 months (OR = 2.65, 95% CI: 1.41–4.98, p = 0.002), and hormonal contraceptive use (OR = 3.21, 95% CI: 1.65–6.23, p = 0.001). Age at first birth showed no significant association (p = 0.651). Breast cancer incidence among outpatients is strongly associated with age, family history, early menarche, short breastfeeding duration, and hormonal contraceptive use. Targeted prevention strategies and early screening programs are urgently needed for high-risk groups.

Keywords: Breast cancer, Risk factors, Family history, Hormonal contraceptive use, Outpatients.

Introduction

Breast cancer is the most common cancer in women and the leading cause of cancer-related deaths globally (World Health Organization, 2023). In 2022, approximately 29.13% of breast cancer cases worldwide resulted in death, indicating a high global case fatality rate (World Health Organization, 2024). Within Southeast Asia, there were 313,537 breast cancer cases (13.2% of all cancers) and 142,986 deaths (9.4%) in 2022 (Global Cancer Observatory, 2022).

In Indonesia, breast cancer remains a major public health problem. In 2022, there were 66,271 cases (16.2%) with 22,598 deaths (9.3%) (Global Cancer Observatory, 2022a). The high prevalence of breast cancer has made it a top priority in the government's health agenda. The Ministry of Health has outlined the National Breast Cancer Management Strategy, which includes health promotion, early detection, and case management, as part of the National Action Plan for Cancer 2024–2034 (Kementerian Kesehatan RI, 2022).

At the provincial level, North Sumatra reported 3,206 cancer cases in 2022, with breast cancer being the most common type (393 cases) (North Sumatra Provincial Government, 2023). RSU Haji Medan serves as a referral hospital for cancer cases in the province and is likely among the top outpatient facilities for breast cancer treatment. In 2024 alone, the hospital recorded 1,665 outpatient breast cancer cases (North Sumatra Provincial Government, 2022).

Although national and provincial data highlight the magnitude of the breast cancer burden, limited research has explored specific risk factors for breast cancer in the RSU Haji Medan outpatient population. Local variations in socio-demographic and reproductive characteristics may influence the strength of associations reported in broader studies. Without local evidence, targeted prevention and early detection strategies cannot be optimally designed.

Therefore, this study aims to determine the factors associated with the incidence of breast cancer among outpatients at RSU Haji Medan in 2025.

Literatur Review

Breast cancer occurs due to the uncontrolled growth of abnormal cells in breast tissue and can spread to other organ (WHO, 2024a). Globally, breast cancer is the most common cancer in women and the second leading cause of cancer-related mortality (IARC, 2024). In Southeast Asia, breast cancer ranks as the second leading cause of cancer death (Global Cancer Observatory, 2022c).

In Indonesia, breast cancer is also one of the most prevalent malignancies. The National Committee for Cancer Control (2015) states that risk factors include age over 40, family history, hormonal contraceptive use, early menarche (<12 years), late age at first birth (>35 years), not breastfeeding, and unhealthy lifestyles such as smoking, alcohol consumption, obesity, and lack of physical activity (Kementerian Kesehatan RI, 2015). At the local level, data from Medan Haji General Hospital in 2024 showed that breast cancer ranked among the top 10 most common outpatient diseases, with 1,665 recorded cases.

Previous studies have shown inconsistent findings regarding these risk factors. Research by Pani and Zulala (2024) reported a significant association between age and family history with breast cancer incidence. Conversely, Dati et al. (2021) that despite most respondents being over 40 years old, no significant relationship was observed, which may be attributed to lifestyle differences or sampling methods. Similarly, Mochtar et al. (2024) identified early menarche, not breastfeeding, and hormonal contraceptive use as significant predictors, while Mudhawaroh et al. (2022) reported no significant associations for hormonal contraceptive use and age at menarche, possibly due to high awareness of healthy lifestyles among respondents.

These contrasting results highlight a research gap regarding which risk factors are most influential in the Indonesian context, particularly in Medan. Considering the high number of breast cancer cases at Medan Haji General Hospital, it is essential to conduct further research to clarify the most relevant risk factors locally. The findings are expected to provide a stronger evidence base for targeted health promotion, early detection, and intervention strategies that are more effective and context-specific.

Method

This research is a quantitative, analytical study with an observational design, employing a cross-sectional approach. The study was conducted at the Surgical Clinic of Haji General Hospital, Medan, from February to July 2025. The population consisted of all female patients visiting the Surgical Clinic of Haji General Hospital in Medan during the study period. The sample size was calculated using the Lemeshow formula for estimating proportions, with parameters Z1−α/2=1.96Z_{1-α/2} = 1.96Z1−α/2=1.96 (95% CI), Z1−β=1.28Z_{1-β} = 1.28Z1−β=1.28 (90% power), Po=57.5%P_o = 57.5\%Po=57.5%, Pa=42.5%P_a = 42.5\%Pa=42.5%, and an estimated difference of 15%. Based on this calculation, a minimum of 114 patients was required. Sampling was carried out using purposive sampling, with respondents selected according to predetermined inclusion and exclusion criteria. The inclusion criteria were: (1) female patients aged ≥18 years, (2) registered as outpatients at the Surgical Clinic of Haji General Hospital during the study period, and (3) willing to participate by signing informed consent. The exclusion criteria were: (1) patients with incomplete medical record data, (2) patients with severe physical or cognitive limitations that hindered communication, and (3) patients who refused to participate.

Primary data were obtained through direct interviews with respondents using a structured questionnaire. The questionnaire was adapted from several previous sources, including theses by Yanti (2016) and Wijaya (2018), as well as the Non-Communicable Disease Research questionnaire compiled by the Indonesian Ministry of Health (2016). To ensure quality, the instrument underwent validity testing using the Pearson Product Moment correlation on 30 pilot respondents, with all items declared valid (r-count > r-table). Reliability testing was performed using Cronbach's Alpha, which yielded $\alpha \geq 0.70$, indicating good internal consistency. Secondary data were obtained from hospital medical records and other reliable sources such as WHO and the Indonesian Ministry of Health.

Data processing included the stages of editing, coding, entry, and cleaning before analysis with SPSS software. Data analysis consisted of univariate analysis to describe the frequency distribution of each variable and bivariate analysis to test the association between independent variables (age, family history, age at menarche, age at first birth, breastfeeding history, and hormonal contraceptive use) and breast cancer incidence. The Chi-square test was used because both dependent and independent variables were categorical. A significance level of $p < 0.05$ was set to determine statistically significant associations.

Ethical Considerations

Ethical approval was not required for this study as it did not involve any invasive procedures or interventions and posed minimal risk to participants. However, all participants were fully informed about the study objectives and procedures and provided written informed consent prior to participation. The confidentiality and anonymity of all data were strictly maintained in accordance with the principles of the Declaration of Helsinki.

Result

Table 1. Distribution of the Proportion of Breast Cancer Incidences at Haji Medan General Hospital in 2025

Respondent Status	n	%
Breast cancer	69	60,5
No breast cancer	45	39,4
Total	114	100,0

Based on table 1, it can be seen that of the 114 respondents, there were 69 people (60.5%) who were diagnosed with breast cancer, while 45 people (39.4%) did not have breast cancer.

Table 2. Distribution of Respondents' Proportion Based on Sociodemographics at Haji Medam General Hospital in 2025

Characteristics	n	%
Age		
26-35 years	12	10,5
36-45 years	23	20,2
46-55 years	42	36,8
56-65 years	32	28,1
>65 years	5	4,4
Ethnicity		
Malay	5	4,4
Javanese	53	46,5
Batak	36	31,6
Minangkabau	10	8,8
Others	10	8,8
Education		
No formal education	3	2,6
Elementary School	13	11,4
Junior High School	28	24,6
Senior High School / Vocational High School	35	30,7
Higher Education	35	30,7
Occupation		
Private Employee	11	9,6
Entrepreneur	13	11,4
Civil Servant	9	7,9
Housewife	81	71,1
Others	0	0,0

Based on table 2, the majority of respondents are in the age range of 46–55 years, namely 42 people (36.8%), followed by the 56–65 age group with 32 people (28.1%). Respondents aged 36–45 years were recorded at 23 people (20.2%), while those aged 26–35 years were 12 people (10.5%). The age group > 65 years was the smallest, namely 5 people (4.4%). Viewed from ethnicity, respondents were dominated by the Javanese tribe with 53 people (46.5%), followed by the Batak tribe with 36 people (31.6%). The Minang tribe and other ethnic groups each number 10 people (8.8%), while the Melayu tribe is the smallest group with 5 people (4.4%). In terms of education, the highest levels of education are SMA/SMK and tertiary institutions, each with 35 people (30.7%). Furthermore, as many as 28 people (24.6%) had at least junior high school education, 13 people (11.4%) graduated from elementary school, and only 3

people (2.6%) had no school education. In terms of work, the majority of respondents are housewives, 81 people (71.1%). Other respondents consisted of 13 self-employed people (13%), 11 private employees (9.6%), and 9 civil servants (7.9%).

Table 3. Distribution of the Proportion of Respondents Based on Family History of Breast Cancer at Haji General Hospital Medan in 2025

Family History of Breast Cancer	n	%
Present	73	64,0
Absent	41	36,0
Total	114	100,0

Based on table 3 above, it can be seen that the distribution of the proportion of respondents at Haji Medan General Hospital in 2025 based on family history of breast cancer, respondents who had a family history of breast cancer were 73 people (64.0%) and respondents who did not have a family history of breast cancer were 41 people (36.0%).

Table 4. Distribution of the Proportion of Respondents by Age at First Menstruation (Menarche) at Medan Haji General Hospital in 2025

Age at First Menstruation (Menarche)	n	%
< 12 years	63	55,3
≥ 12 years	51	44,7
Total	114	100,0

Based on the table above, it can be seen that the distribution of the proportion of respondents at Haji Medan General Hospital in 2025 based on age at first menstruation (menarche), respondents who experienced menarche < 12 years were 63 people (55.3%) and respondents who experienced menarche ≥ 12 years were 51 people (44.7%).

Table 5. Distribution of Respondents' Proportion by Age at First Child Birth at Medan Hajj General Hospital in 2025

Age at First Childbirth	n	%
< 35 years	68	59,6
≥ 35 years	46	40,4
Total	114	100,0

Based on the table above, it can be seen that the distribution of the proportion of respondents at Haji Medan General Hospital in 2025 based on age at giving birth to their first child, respondents who gave birth to their first child ≥ 35 years were 46 people (40.4%) and respondents who gave birth to their first child < 35 years were 68 people (59.6%).

Table 6. Distribution of the Proportion of Respondents Based on Breastfeeding History at Medan Haji General Hospital in 2025

History of Breastfeeding	n	%
< 6 months	61	53,5
≥ 6 months – 24 months	53	46,5
Total	114	100,0

Based on the table above, it can be seen that the distribution of the proportion of respondents at Haji Medan General Hospital in 2025 based on the history of breastfeeding, respondents who gave breast milk < 6 months were 61 people (53.5%) and respondents who gave breast milk ≥ 6 months-2 years were 53 people (46.5%).

Table 7. Distribution of Respondents' Proportion Based on Breastfeeding History at Medan Haji General Hospital in 2025

Use of Hormonal Contraceptives	n	%

Yes	74	64,9
No	40	35,1
Total	114	100,0

Based on the table above, it can be seen that the distribution of the proportion of respondents at Haji Medan General Hospital in 2025 based on the use of hormonal contraception, respondents who used hormonal contraception were 74 people (64.9%) and respondents who did not use hormonal contraception were 40 people (35.1%).

Table 8. Cross-tabulation between Age and Breast Cancer Incidence at Haji General Hospital, Medan in 2025

Age	Breast Cancer Incidence				Total		*p-value*	RP (95%CI)
	Breast Cancer		No Breast Cancer					
	n	%	n	%	n	%		
≥ 50 years	45	70,3	19	29,7	64	100,0	0,016	1, 465 (1,054 - 2,037)
< 50 years	24	48,0	26	52,0	50	100,0		
Total	69	60,5	45	39,4	114	100,0		

Based on the table above, it is known that the majority of respondents were aged ≥50 years, namely 64 people (56.1%), with 45 people (70.3%) of them experiencing breast cancer. In contrast, 19 people (29.7%) did not experience breast cancer. Meanwhile, respondents aged <50 years numbered 50 people (43.9%), with 24 people (48.0%) experiencing breast cancer and 26 people (52.0%) not experiencing it. This comparison shows that the proportion of breast cancer incidence is higher in the age group ≥50 years compared to younger age groups.

The results of the statistical analysis using the Chi-square test showed a p-value of 0.016, which is smaller than the significance limit of 0.05. Therefore, it can be concluded that there is a significant relationship between age and the incidence of breast cancer at Medan Haji General Hospital in 2025. In addition, the results of prevalence calculations show that individuals aged ≥50 years have a 1.465 times higher risk of developing breast cancer than individuals aged <50 years. Thus, age is a significant risk factor in the incidence of breast cancer in this study environment.

Table 9. Crosstabulation between Family History of Breast Cancer and Breast Cancer Incidence at Haji General Hospital Medan in 2025

Family History of Breast Cancer	Breast Cancer Incidence				Total		*p-value*	RP (95%CI)
	Breast Cancer		No Breast Cancer					
	n	%	n	%	n	%		
Present	51	69,9	22	30,1	73	100,0	0,007	1, 591 (1,091-2,321)
Absent	18	43,9	23	56,1	41	100,0		
Total	69	60,5	45	39,4	114	100,0		

Based on Table 9, it is known that the majority of respondents, 73 (64.0%), had a family history of breast cancer. Of these, 51 (69.9%) had breast cancer, while 22 (30.1%) did not. Meanwhile, 41 (36.0%) respondents did not have a family history of breast cancer, of which 18 (43.9%) had breast cancer and 23 (56.1%) did not. These data indicate a higher incidence of breast cancer in individuals with a family history of the disease.

The results of the statistical test using the Chi-square method produced a p-value of 0.007, which is smaller than 0.05; therefore, it can be concluded that there is a significant relationship between family history and the incidence of breast cancer at Medan Haji General Hospital in 2025. The prevalence ratio value of 1.591 indicates that individuals who have a family history of breast cancer have a 1.591 times greater risk, or 59.1% higher, of developing breast cancer compared to individuals who do not have such a history. Therefore, a family history of breast cancer can be considered a significant risk factor in the incidence of breast cancer in this study area.

Table 10. Cross-tabulation between Age at First Menstruation (Menarche) and Breast Cancer Incidence at Haji General Hospital, Medan in 2025

Age at First Menstruation (Menarche)	Breast Cancer Incidence				Total		*p-value*	RP (95%CI)
	Breast Cancer		No Breast Cancer					
	n	%	n	%	n	%		
< 12 years	44	69,8	19	30,2	63	100,0	0,024	1, 425 (1,031-1,969)
≥ 12 years	25	49,0	26	51,0	51	100,0		
Total	69	60,5	45	39,4	114	100,0		

Based on the table above, it is known that 63 (55.3%) respondents experienced menarche before the age of 12, with 44 (69.8%) of them having breast cancer and 19 (30.2%) not having cancer. Meanwhile, 51 (44.7%) experienced menarche at the age of 12 or older, with 25 (49.0%) of them having breast cancer and 26 (51.0%) not having it. These data indicate that breast cancer incidence is higher in women who experience early menarche (<12 years).

The results of the Chi-square test showed a p-value of 0.024, which is smaller than 0.05, so there is a significant relationship between the age of first menstruation (menarche) and the incidence of breast cancer at the Haji General Hospital in Medan in 2025. The prevalence ratio of 1.425 indicates that women who experienced menarche before the age of 12 years have a 1.425 times higher risk, or (42.5%) greater, of experiencing breast cancer compared to those who experienced menarche at the age of ≥12 years. Thus, the age at first menstruation is one of the risk factors that play a role in the incidence of breast cancer in this study area.

Table 11. Cross-tabulation between age at birth of first child and breast cancer incidence at Haji General Hospital, Medan in 2025

Age at First Childbirth	Breast Cancer Incidence				Total		*p-value*
	Breast Cancer		No Breast Cancer				
	n	%	n	%	n	%	
≥ 35 years	29	63,0	17	37,0	46	100,0	0,651
< 35 years	40	58,8	28	41,2	68	100,0	
Total	69	60,5	45	39,4	114	100,0	

The table shows that 46 (40.4%) respondents gave birth to their first child at age ≥35, with 29 (63.0%) experiencing breast cancer and 17 (37.0%) not experiencing it. Meanwhile, 68 (59.6%) respondents gave birth to their first child at age <35, of which 40 (58.8%) experienced breast cancer and 28 (41.2%) did not. Percentage-wise, the incidence of breast cancer appears to be slightly higher in the age group ≥35 at the time of their first child's birth, but the difference is not significant.

The Chi-square analysis showed a p-value of 0.651, which is greater than 0.05, indicating no significant association between age at first child's birth and breast cancer incidence at Medan Haji General Hospital in 2025. Therefore, age at first child's birth was not a significant risk factor for breast cancer incidence in this study. This finding indicates that this variable cannot be used as the leading indicator in predicting the risk of breast cancer in the respondent population studied.

Table 12. Cross-tabulation between Breastfeeding History and Breast Cancer Incidence at Medan Haji General Hospital in 2025

History of Breastfeeding	Breast Cancer Incidence				Total		*p-value*	RP (95%CI)
	Breast Cancer		No Breast Cancer					
	n	%	n	%	n	%		
< 6 months	45	73,8	16	26,2	61	100,0	0,002	1, 629 (1,169-2,270)
≥ 6 months- 24 months	24	45,3	29	54,7	53	100,0		
Total	69	60,5	45	39,4	114	100,0		

Based on the table above, it is known that 61 respondents (53.5%) breastfed for less than 6 months, with 45 (73.8%) of them developing breast cancer and 16 (26.2%) not developing breast cancer. Meanwhile, 53 respondents (46.5%) breastfed for ≥6 months to 2 years, with 24 (45.3%) developing breast cancer and 29 (54.7%) not developing breast cancer. These data indicate that breast cancer incidence is higher in mothers who breastfed for a shorter period (<6 months).

The results of the analysis using the Chi-square test showed a p-value of 0.002, smaller than 0.05, which means there is a significant relationship between the history of breastfeeding and the incidence of breast cancer at the Haji Medan General Hospital in 2025. The prevalence ratio value of 1.629 indicates that mothers who breastfeed for less than 6 months have a 1.629 times higher risk, or (62.9%) greater, of experiencing breast cancer compared to mothers who breastfeed for at least 6 months to 2 years. Thus, the history of breastfeeding is an important risk factor in the incidence of breast cancer in the population studied.

Table 13. Cross Tabulation between Hormonal Contraceptive Use and Breast Cancer Incidence at Haji Mekar General Hospital in 2025

Use of Hormonal Contraceptives	Breast Cancer Incidence				Total		*p-value*	RP (95%CI)
	Breast Cancer		No Breast Cancer					
	n	%	n	%	n	%		
Yes	53	71,6	21	28,4	74	100,0	0,001	1, 791 (1,193-2,687)
No	16	40,0	24	60,0	40	100,0		
Total	69	60,5	45	39,4	114	100,0		

Based on the table above, it is known that 74 (64.9%) respondents used hormonal contraception, of which 53 (71.6%) had breast cancer and 21 (28.4%) did not. Meanwhile, 40 (35.1%) respondents did not use hormonal contraception, with 16 (40.0%) having breast cancer and 24 (60.0%) not having breast cancer. These data indicate a higher incidence of breast cancer in the group using hormonal contraception compared to those not using it.

The analysis using the Chi-square test showed a p-value of 0.001, which is less than 0.05, indicating a significant association between hormonal contraception use and breast cancer incidence at Medan Haji General Hospital in 2025. The prevalence ratio of 1.791 indicates that women using hormonal contraception have a 1.791-fold higher risk, or 79.1% greater, of developing breast cancer compared to women not using it. Thus, hormonal contraceptive use is an important risk factor for breast cancer incidence in this study population.

Discussion Overview of Breast Cancer Incidence at Medan Haji General Hospital

The incidence of breast cancer at Medan Haji General Hospital in 2025 was recorded at 60.5%, higher than the proportion without cancer (39.4%). This is in line with breast cancer's position as the 7th most common disease in outpatient care in 2024. Furthermore, existing patients diagnosed between 2022 and 2024 are still actively monitored because they are required to take medication for 5 years to prevent recurrence. The large number of new patient referrals also contributes to the increase in the number of cases. Key risk factors include age, family history, age at menarche and first birth, breastfeeding, and use of hormonal contraception.

According to the research data, the youngest breast cancer patient was 32 years old and the oldest was 77 years old, with an average age of 51 years. The majority of patients were in stages 2–3, indicating that the cancer had progressed quite far. Stage 2 is characterized by a tumour measuring 2–5 cm and possible involvement of the lymph nodes in the armpit, while stage 3 indicates more extensive spread to surrounding breast tissue, such as the skin and chest muscles. However, proper treatment still offers a chance of recovery, especially if detected early.

Early Detection of Breast Cancer in Patients at Haji General Hospital, Medan

Most respondents, 85 (74.6%), had performed a breast self-examination (BSE), indicating a relatively high level of initial awareness. However, at the most recent examination, only 12.3% reported normal breast health, while 42.1% found a lump, and 20.2% experienced a wound or inflammation. Although 42.1% of respondents followed up with a medical examination, some respondents (20.2%) opted for

traditional medicine, while others (8.8%) took no action at all. This reflects a lack of awareness regarding the importance of medical follow-up after discovering symptoms.

Meanwhile, 72.8% of respondents had undergone a clinical examination (SADANIS), mainly at a hospital or community health centre. The latest examination revealed numerous lumps, some of which were accompanied by wounds or inflammation. Follow-up procedures included ultrasound (20.2%), mammography (2.6%), and biopsy (50%). Unfortunately, some respondents are still reluctant to undergo SADANIS because they feel they have no symptoms. However, routine clinical examinations should be conducted to detect cancer at an early stage.

Only 36.8% of respondents had ever had a mammogram, mainly at a hospital or laboratory. The results indicated that 32.5% had cancer, and all underwent surgery as a follow-up. Meanwhile, respondents who had never had a mammogram reported no complaints (24.6%) or fear of pain during the examination (9.6%). Other reasons included certain breast conditions or the belief that other tests, such as biopsies, were sufficient. This indicates the low utilization of mammography for early detection, despite its crucial benefits in identifying potential malignancies at an early stage.

The Relationship Between Age and Breast Cancer Incidence

Based on data from Medan's Haji General Hospital in 2025, the majority of breast cancer cases were found in respondents aged ≥50 years, amounting to 45 (70.3%), while respondents aged <50 years were more likely to have no cancer (52.0%). The Chi-square test showed a p-value of 0.016 <0.05, indicating a significant relationship between age and breast cancer incidence. This finding aligns with research by Kurniawati et al. (2019) which showed that 81.8% of breast cancer patients were in the age group >50 years, with a p-value of 0.003, also significant.

The risk of breast cancer increases with age, particularly after menopause, due to accumulated cell damage, long-term estrogen exposure, and decreased immune system function and DNA repair (Ashariati, 2020). Mega et al. (2024) also noted that cancer incidence begins to increase after age 40 and peaks in the 70s. According to the American Cancer Society (2020), approximately 82% of breast cancer cases occur in women aged ≥50 years, with the most extensive distribution in the 60–69 years (31%) and 50–59 years (26%). Age remains one of the main risk factors for breast cancer incidence.

The Relationship Between Family History and Breast Cancer

Based on data from Medan's Haji General Hospital in 2025, the majority of respondents with a family history of breast cancer experienced breast cancer 51 people (69,9%). Conversely, respondents without a family history were the most likely to have no tumor 23 people (56,1%). The Chi-square test results showed a p-value of 0.007 < 0.05, indicating a significant relationship between family history and breast cancer incidence. This finding is supported by research by Sipayung et al. (2020) at Dr. Pringadi General Hospital, Medan (p = 0.02) and Febrianti and Wahidin (2021), which found that 71.6% of women with a family history experienced breast cancer (p = 0.001).

Interview data indicate that close relatives such as mothers, sisters, and grandmothers are the family members most likely to develop breast cancer. A person's risk increases two to threefold if they have one or two first-degree relatives with breast cancer (Smith et al., 2019). Breast cancer is a familial cancer, with approximately 75% of cases of Li-Fraumeni syndrome (LFS) caused by mutations in the p53 gene, a tumor growth inhibitor. The risk is also increased if there is a BRCA1 gene mutation in the family, which is significantly associated with breast and ovarian cancer (Freus et al., 2022).

The Relationship Between Age at Menarche (Menstruation) and Breast Cancer Incidence

At Medan Haji General Hospital in 2025, the majority of respondents who experienced menarche before 12 years of age also experienced breast cancer (44 respondents) (69.8%), while respondents with menarche after 12 years of age were more likely to experience breast cancer (26 respondents) (51.0%). The Chi-square test showed a p = 0.024, indicating a significant association between age at menarche and breast cancer incidence. These results align with research by Paratiwi (2021), which found that 60.7% of women with menarche before 12 years of age developed breast cancer (p = 0.014), and research by Pratiwi dan Alqausar (2024) , which showed that 72.6% of breast carcinoma patients experienced early menarche (p = 0.021).

Early menarche increases the risk of breast cancer by prolonging exposure to the hormones estrogen and progesterone, which stimulate breast tissue proliferation. Hero (2021) noted that the leptin G-2548A polymorphism is associated with menarche at <13 years and an increased risk of cancer, particularly in individuals with the AA genotype. Factors influencing menarche include genetics,

nutritional status, lifestyle, and social influences, such as exposure to sexual media and peer relationships (Amalia et al., 2024). Late menopause also prolongs hormone exposure, thereby increasing breast cancer risk (American Cancer Society, 2025; Cancer Australia, 2024).

The Relationship Between Age at First Birth and Breast Cancer Incidence

Respondents who gave birth to their first child at age 35 or older experienced breast cancer (63%), while those who gave birth at age 35 also experienced breast cancer (58.8%). However, the Chi-square test showed a p-value of 0.651, indicating no significant association between age at first birth and breast cancer incidence at Medan Haji General Hospital in 2025. This finding aligns with research by Alimun et al. (2024), which found that the majority of breast cancer patients gave birth before age 30, but found no significant association (p-value 0.645). Conversely, research by Astri et al. (2020) found a significant association between age at first birth and breast cancer incidence (p-value 0.001).

Theoretically, women who experience their first full-term pregnancy at age 35 or older have a higher risk of breast cancer due to the diminished protective effect of estrogen (Irma et al., 2023). A first pregnancy at a young age can stimulate the maturation of breast cells, making them more resistant to carcinogenic changes. Furthermore, women who give birth at an older age tend to have more menstrual cycles before becoming pregnant, which contributes to the accumulation of estrogen exposure. Hormonal imbalances, particularly estrogen, are also known to trigger the formation of cancer cells (Gatsu et al., 2023). Interestingly, it was also found that some respondents had their first birth at a very young age, namely 19 years, which increases the risk of cervical cancer due to biological susceptibility to HPV infection (World Health Organization, 2024; American Cancer Society, 2020).

The Relationship Between Breastfeeding History and Breast Cancer Incidence

The findings revealed that the majority of respondents who breastfed for less than 6 months experienced breast cancer (73.8%), while those who breastfed for ≥6 months to 2 years mainly did not experience cancer (54.7%). The Chi-square test showed a p-value of 0.002 ($p<0.05$), indicating a significant relationship between breastfeeding history and breast cancer incidence at Medan Haji General Hospital in 2025. This finding aligns with research by Irfannur dan Kurniasari (2021), which found a significant relationship ($p=0.000$) between breastfeeding history and cancer incidence, with a higher prevalence among non-breastfeeders. Similarly, a study by Salsabila dan Mediana, (2024) showed that women who breastfed for 0–6 months were at higher risk of developing cancer than those who breastfed for more than 6 months ($p=0.000$).

Biologically, breastfeeding lowers estrogen and progesterone levels, which can reduce the stimulation of breast tissue growth, thus reducing the risk of cancer (Sarinaex et al, 2021: Desweni, 2025). During breastfeeding, prolactin levels increase, suppressing ovulation and causing amenorrhea, thus acting as a natural contraceptive known as the lactational amenorrhea method (WHO, 2023). UNICEF (2022), adds that only around 40% of infants under 6 months of age are exclusively breastfed, even though prolonged breastfeeding is not only good for the baby but also reduces the risk of breast and ovarian cancer in the mother.

The Relationship Between Hormonal Contraceptive Use and Breast Cancer Incidence

The findings revealed that the majority of respondents with breast cancer (53 respondents) used hormonal contraception (71.6%). Meanwhile, the majority of those without breast cancer did not use hormonal contraception (60.0%). Chi-square test results indicated a significant association between hormonal contraception use and breast cancer incidence at RSU Haji Medan in 2025 ($p = 0.001$). This finding aligns with Hasnita (2020) study, which reported a significant association between hormonal contraception use and breast cancer incidence ($p = 0.000$), and is supported by Sofa et al. (2024) study at the Bintang Kimaja Clinic in Bandar Lampung ($p = 0.004$).

The questionnaire interviews revealed that the majority of respondents used hormonal contraception, with the most common methods being injectables (30.7%) and birth control pills (20.2%). Other methods included intrauterine devices (IUDs) (8.8%) and implants (5.3%). The highest duration of hormonal contraceptive use was in the ≥5-year group (44.7%), while the remainder used it for <5 years (20.2%). Theoretically, hormonal contraceptives, especially oral contraceptives, can increase free estrogen levels in the body due to decreased SHBG, thereby stimulating the activity of genes involved in cancer development, such as BRCA1, BRCA2, HER2/NEU, and p53 (Afdalia & Manaf, 2020).

In addition to birth control pills, injectable contraceptives also have the potential to increase the risk of breast cancer. Progesterone injections such as Depo Medroxyprogesterone Acetate (DMPA),

containing 150 mg DMPA administered every three months, and Depo Norethisterone Enantate (Net-En), injected every two months, are known to cause breast pain and increase the risk of cancer (Prihati et al., 2022). Differences in metabolism between DMPA and Net-En affect the recovery time for fertility, but both still have the potential to have long-term hormonal effects on breast tissue.

Conclusion

Based on the research results, the incidence of breast cancer was 60.5%. The majority of respondents were aged 46–55, Javanese, had a high school/vocational school or college education, and worked as housewives. Most had a family history of breast cancer, menarche before 12 years, gave birth to their first child before 35 years, breastfed for ≤6 months, and used hormonal contraception. Most had also undergone early detection (BSE, SADANIS, and mammography). A significant association ($p < 0.05$) was found between age, family history, age at menarche, history of breastfeeding, and use of hormonal contraception with breast cancer incidence. Conversely, age at first birth was not significantly associated ($p > 0.05$). The factor with the highest prevalence ratio was the use of hormonal contraception (PR: 1.791; 95% CI: 1.193–2.687).

Acknowledgments

The researchers would like to thank all patients who participated in this study and Haji General Hospital Medan for their support and permission to serve as the research location.

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