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ANALYSIS OF THE RELATIONSHIP OF FACTORS TRIGGERING BREAST DISORDERS WITH THE RESULTS OF ULTRASOUND IMAGE EXPECTATION IN THE IMPLEMENTATION OF THE *MAMMAE ORGAN SCANNING PROTOCOL*

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KEYWORDS
ultrasound, mammae, screening, awareness, trigger factors.

ABSTRACT
This study aims to determine the relationship between trigger factors for breast abnormalities with the results of ultrasound image observation. This study is an analytical observational study with a retrospective approach. The research design used was a control case design. Data collection will be carried out from April to June 2023 at the MCU Clinic in the Jabodetabek area. The study data were analyzed using bivariate and multivariate analysis. The results of the bivariate analysis showed p values = 0.000 < 0.005 for each of the internal and external trigger factor variables. The conclusion in this study is that there is a significant relationship between the history of BSE, history of childbirth, history of breastfeeding, history of hormonal birth control use, genetic history, history of alcohol consumption, history of smoking, history of menarche, history of menopause, history of consumption of junk food, and history of consumption of soft drinks (p-value = 0.000) with observation of ultrasound images on the breast organ scanning protocol. Higher Diagnostic Accuracy through consideration of the triggering factors of breast disorders in ultrasound image results. Guide to the Development of Scanning Protocols that are More Effective in detecting breast disorders. Identify Risk Factors that allow special attention in the management of breast health. Increased Public Awareness of the importance of routine breast exams. Direction for Advanced Research to understand more deeply the relationship between trigger factors and ultrasound image outcomes. Potential Improvement of Clinical Practice and Guidelines by considering research findings.

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INTRODUCTION

Breast cancer ranks first in Indonesia with the highest cancer incidence. It is the leading cause of death caused by cancer (Wulandari, Bahar, & Ismail, 2017). Breast cancer accounts for 68,858 cases (16.6%) of 396,914 new cancer cases, while the death rate reached more than 22,000 in 2020. As many as 43% of deaths due to cancer can be prevented if people living with cancer routinely carry out early detection and avoid factors of cancer risk (Riawati, 2019). Cancer (malignant tumor, neoplasm) is a general term for a group of masses that can attack any body part (Dinuriah, 2015). One of the characteristics of cancer is the formation of abnormal cells that quickly grow beyond normal limits, then can attack adjacent parts of the body and spread to other organs (metastases) (Awaliyah, 2021). The leading cause of death from cancer is extensive metastasis (Mukherjee, 2020). Apart from breast cancer, several other disorders are often encountered in daily practice, for example, fibroadenoma mammae, tumors, galactocelles, intraductal papillomas, mastitis, fibrocystic (Saktiawan & Atmiasri, 2017). Unhealthy lifestyle, consumption of foods that contain lots of fat, not

breastfeeding, malnutrition, not having children, giving birth to the first child over 35 years, radiation, alcohol consumption, obesity, and long-term hormones are factors that trigger cancer in women (Mulyani & Rinawati, 2013).

Studies show that the prevalence of breast self-examination is low. Family history of breast cancer, knowledge about Breast Self-Examination (BSE), and self-awareness in performing BSE have a statistically significant relationship with BSE practice (Dagne, Ayele, & Assefa, 2019). According to the 2016 Non-Communicable Diseases (NCD) Research, it was found that 53.7% of people had never done BSE, 46.3% of people had done BSE; and 95.6% of people did not do SADANIS, while 4.4% had done SADANIS (Yusnilawati, Mawarti, & Rudini, 2019).

There are several ways to examine the mammary glands, including mammography examination, tomosynthesis mammogram (DBT), magnetic resonance image (MRI), and ultrasonography (USG). However, each examination has its advantages and disadvantages. Mammography has limitations compared to other examinations, such as the possibility of discomfort, and tends to be painful (Dibble, Singer, Baird, & Lourenco, 2021). This is because mammography examinations require compression of the patient's breasts, and storing radiographic films is also troublesome. Suppose the film is damaged or the image results are inadequate. In that case, the process must be repeated and has a long duration for interpretation, so mammography is rarely used (Wulandari et al., 2017). The use of MRI for breast screening is relatively expensive; apart from that, in Jabodetabek, there are still very few hospitals that have MRI equipment, which makes breast screening to detect BSE. In contrast, 46.3% of people have had BSE, and 95.6% of people did not do SADANIS, while 4.4% had done SADANIS.

There are several ways to examine the mammary glands, including mammography, mammogram tomosynthesis (DBT), magnetic resonance image (MRI), and ultrasonography (USG). However, each examination has its advantages and disadvantages. Mammography has limitations compared to other examinations, such as the possibility of discomfort, and tends to be painful (Dibble et al., 2021). This is because mammography examination requires breast compression on the patient; storing radiographic films is also a hassle. Suppose the film is damaged or the image results are inadequate. In that case, the process must be repeated and has a long duration for interpretation, so mammography is rarely used (Wulandari et al., 2017).

Using MRI for breast screening is relatively expensive; besides that, in Jabodetabek, very few hospitals still have MRI equipment, making breast screening to detect abnormalities using MRI impractical and rarely of interest (Comstock et al., 2020). Ultrasound using a high-frequency transducer and Doppler examination can not differentiate cystic or solid tumors very well. However, it can also determine the blood supply and condition of the surrounding tissue to be the basis for an excellent diagnosis (Siregar et al. N, Santoso T, 2022).

Mammary ultrasound abnormalities in women of reproductive age, coupled with the culture of young women who are lazy about carrying out routine mammary screening due to the absence of symptoms and the low level of knowledge regarding BSE techniques, makes it necessary to analyze the relationship between findings of mammary abnormalities in women of childbearing age and factors. Factors that cause breast cancer using ultrasound imaging are increasingly needed (Evans et al., 2018). A sonographer carries out the ultrasound examination at the Medical Check-Up clinic. RI Minister of Manpower Decree No. 237 of 2020 explains that a sonographer can perform an ultrasound by the applicable code of ethics.

Diagnostic biomarkers that identify disease subtypes often play an important role when diagnostic classification results can be used as prognostic biomarkers and predictive biomarkers (Atallah, Abd. Aziz, Teik, Shafiee, & Kampan, 2021). Treatment of breast cancer has a high

possibility of being cured by doing regular treatment, resulting in a good quality of life and can carry out activities. The fulfillment of his needs returns without dependence on others. So that it can be independent emotionally, socially, and physically well-being. In general, the quality of life of breast cancer patients depends on the support relationship between family and patient (Kesler et al., 2013).

Based on the background stated above, this study aimed to identify and analyze the relationship between triggering factors for breast abnormalities and the results of ultrasound image expertise in applying the mammary organ scanning protocol. By understanding the relationship between trigger factors and ultrasound image results, this study can provide benefits in improving accuracy in diagnosing breast disorders. Patients can get a more precise and quick diagnosis.

Higher Diagnostic Accuracy through consideration of the triggering factors of breast disorders in ultrasound image results. Guide to the Development of Scanning Protocols that are More Effective in detecting breast disorders. Identify Risk Factors that allow special attention in the management of breast health. Increased Public Awareness of the importance of routine breast exams. Direction for Advanced Research to understand more deeply the relationship between trigger factors and ultrasound image outcomes. Potential Improvement of Clinical Practice and Guidelines by considering research findings.

METHOD

This type of research is analytical observational research with a retrospective approach. The research design used in this study was *a case-control design*, which is a study in which the research begins by determining the case group (with disease) and the control group (without disease) and then looking at the risk factors in the past. Data collection will be carried out from April to June 2023 at the MCU Clinic in the Jabodetabek area. The study data were analyzed using bivariate and multivariate analysis.

RESULTS AND DISCUSSION

Data was collected at the Tirta Medical Center Bellagio Clinic, Cakra Medika Clinic, and PT Multitama Mitra Sejahtera, with 160 patients as samples. The number of samples, namely average *mammary ultrasound results*, was 80, and abnormal *mammary ultrasound results* were 80. The patient underwent a *mammary ultrasound* by *a sonographer*, and *one radiologist read the examination* results; then, three different radiologists carried out the results *of the examination* by the kappa test.

Table 1. Radiologist Kappa Test Results

radiologg	Frequencyis Normal (n)	Frequencyis Abnormal (n)	∑	Presenta si Valid (%)
RAD 1	80	80	160	100%
RAD 2	80	80	160	100%
RAD 3	80	80	16 0	100 %

From the sample results of 160 samples, with 80 regular and 80 abnormalities, the three radiologists assessed them as 100% valid with expert results and imaging results.

In line with previous research, 135 masses were assessed as BI-RADS categories 4 and 5 on ABUS. They underwent ultrasound-guided core needle biopsy (Sabour, 2019). Agreement of BI-RADS categories was evaluated with the kappa statistical test, and the positive predictive value of each examination was calculated. They reported that the overall agreement between ABUS and HHUS in all cases was good. In both situations, the prevalence of concordant cells is the same. Cells opposite 90° have 10%; However, the different kappa values obtained in each situation were interpreted as very good.

Table 2. Frequency Distribution I

Triggers		F		F		
		N	%	AN	%	
Internals	1.1 R. Childbirth	75	93.8	46	57.5	121 (75.6%)
	1.2 R. Non-giving birth	5	6.3	34	42.5	39 (24.4%)
	1.3 R. Breastfeeding	74	92.5	11	13.8	85 (53.1%)
	1.4 R. Non-breastfeeding	6	7.5	69	86.3	75 (46.9%)
	1.5 R. Genetics	6	7.9	70	92.1	76 (47.5%)
	1.6 R. Non Genetic	74	88.1	10	11.9	84 (52.5%)
	1.7 R. Late Menarche	3	3.8	45	38.3	48 (30%)
	1.8 R. Non Slow Menarche	77	96.3	35	43.8	112 (70%)
	1.9. Slow Menopause	5	6.8	69	69	74 (46.3)
	1.10 Delayed Menopause	75	87.2	11	11	86 (53.8)
External	2.1 R. REALIZE	72	90	27	33.8	99 (61.9%)
	2.2 R Non-BSE	8	10	53	66.3	61 (38.1%)
	2.3 R. Hormonal birth control	9	11.3	61	78.3	70 (43.8%)
	2.4 R. Non-hormonal birth control	71	88.8	19	23.8	90 (56.3%)
	2.5 R. Alcohol consumption	7	8.8	42	52.5	49 (30.6%)
	2.6 R. Non-consumption of alcohol	73	91.3	38	47.5	111 (69.4%)
	2.7 R Smoke	3	3.8	50	62.5	53 (33.1%)
	2.8 RNon-Smoking	77	96.3	30	37.5	107 (66.9%)
	2.9 R Consumption *of junk food*	36	45	80	100	116 (72.5%)
	2.10 R non Consumption *of junk food*	44	55	0	0	44 (27.5%)
	2.11 R. Consumption of *soft drink*	31	38.8	80	100	111 (69.%)
	2.12 R Consumption of *soft drinks*	9	61.3	0	0	49 (30.6%)

Table 3. Bivariate Analysis

Variable	OR	CI 9%	*P value*	Strength Connection
Internals				
1. Status: Give birth to	11,087	4,046 – 30,397	0.000	There is Connection
2. Status Breastfeed	77,364	27,143 – 220,505	0.000	There is Connection
3. Status Genetic	86,333	29,804 – 250,081	0.000	There is Connection
4. Status *Menarche*	33,000	9,596 – 113,479	0.000	There is Connection
5. Status *Menopause*	94,091	31,116 – 284,516	0.000	There is Connection
External				
1. BE AWARE	17.67	7,438 –41,960	0.000	There is Connection
2. UseKB Hormonal	25,327	10,677 – 60,079	0.000	There is Connection
3. History ConsumptionAlcohol	11,526	4,728 – 28,097	0.000	There is Connection
4. History Smoke	42,778	12,391 – 147,684	0.000	There is Connection
5. History Consumption *junk food*	3,222	2,457 –4,226	0.000	There is Connection
6. History Consumption *soft drinks*	3,581	2,656 – 4,828	0.000	There is Connection

After the analysis, bivariate *chi-square results* for all variables. Trigger factors with *mammary* ultrasound image observation results show a value of p = 0.000 < 0.05, so it can be concluded that there is a relationship between all variables and *mammary ultrasound image observation results*.

For internal factors, the first highest proportion was *menopausal status*, where the 95% CI value increased (OR = 94.091; p = 0.000). Meanwhile, the external factor that experienced an increase in CI was smoking history (OR=42.778; p = 0.000).

To find out the variables that have the most dominant influence on mammary ultrasound image observation results, further statistical tests were carried out using multiple logistic regression tests. All independent variables are candidates for logistic regression testing.

Table 4. Logistic Regression of Trigger Factors

Factor Trigger		B	SE	Wald	Df	Sig.	Exp(B)
Interbad	R. giving birthright	-.897	.915	,961	1	.327	.408
	R. Breastfeedingui	- 18,445	40192.9 91	,000	1	1,000	,000
	R. *Menarche*	2,606	.781	11.135	1	,001	13,546
	R. Genetic	2,593	2,112	1,507	1	.220	13,375
	R. *Menopause*	4,079	.594	47,158	1	,000	59.102
Extrnal	R. Consumption Alcohol	1907	,689	7,662	1	,006	6,731
	R. Smoke	3,049	,791	14,840	1	,000	21,094
	R. consumptionof *soft drinks*	22,368	4711.948	,000	1	,996	5179588289.152
	R. ConsumeI *junk food*	17,660	4779.774	,000	1	.997	46753331.756
	R. KB Hormoneal	2,711	,616	19,347	1	,000	15,045
	R. AWARE I	2,423	.647	14,045	1	,000	11,285

The results of the logistic/multivariate regression analysis on internal factors show that of the five candidate variables analyzed together, there is one variable that is proven to have a significant influence on breast cancer, namely menopausal history, which is the most dominant variable influencing breast cancer with p(*sig*,) = 0.000 and the Exp(B)/OR value = 59.102, meaning that a history of *menopause* is 59,102 times greater risk of developing breast cancer than a history of giving birth, a history of breastfeeding, a history of *menarche* and genetic history.

The results of the logistic/multivariate regression test show that the variable that influences diagnosis simultaneously with external factors is a history of smoking with p(sig,) = 0.000 and a value of (Exp B/OR= 21.904), meaning that a history of smoking has a 21,904 times greater risk of developing cancer. Breast compared to other external factors. This research aligns with research (Rukmi, 2018), with the statistical analysis results showing a significant relationship between *menopausal age* ≥55 years and the incidence of breast cancer with a value of p=0.003. The risk is 1.010 (95% CI: 0.00-0.22) times greater than that of women who experience *menopause* at age ≥55.

The statistical analysis results in research (Ningrum & Rahayu, 2021) show a relationship between smoking and the incidence of breast cancer. Breast Cancer at RSUD Dr. Achmad Mochtar Bukittinggi with a p-value of 0.003 for breast cancer to occur compared to respondents in the category of non-smokers.

CONCLUSION

Mammary ultrasound sonograms can be differentiated between expected results and abnormalities identified using the results of the images carried out by a competent *sonographer and the results of the expertise* carried out by a radiologist. Most respondents have a high level of knowledge about BSE, and most respondents have good behavior about BSE. There is a significant relationship between BSE behavior and the incidence of breast abnormalities in this study. It can be seen from the results of mammary ultrasound, which shows that *more* respondents had average results. There is a relationship between birth history, breastfeeding history, history of hormonal birth control use, genetic history, history of alcohol consumption, smoking history, age at *menarche*, age at *menopause*, history of *junk food consumption*, and history of *soft drink consumption* with ultrasound image observation in the implementation of *the mammary* organ *scanning protocol*. The more dominant variable is the history of *menopause*.

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