

Impact of Family Support on Breast Cancer Patient's Nutritional Status in Jakarta

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Abstract. *Dietary habits significantly influence the risk factors for breast cancer, the most common type of cancer. Family support can greatly impact changes in a patient's nutritional status. A study conducted in Jakarta aimed to examine the relationship between family support and the nutritional status of breast cancer patients. The researchers employed non-experimental quantitative methods with a cross-sectional design, using purposive sampling to meet specific inclusion and exclusion criteria. Data were analyzed using the chi-square test. The results showed that 9 respondents (29%) had a normal nutritional status, 22 respondents (71%) were overweight, and 25 respondents (80.6%) received strong family support. Although the findings were analyzed, the study ultimately determined that there was no significant association between family support and nutritional status, as indicated by a p-value of 0.320. However, family support remains important for encouraging healthy dietary habits among breast cancer patients and their families.*

Keywords: *Family Support, Nutritional Status, Breast Cancer*

Received: October 3, 2024

Received in Revised: October 29, 2024

Accepted: November 25, 2024

INTRODUCTION

Breast cancer stands as the most frequently diagnosed cancer in women globally and continues to be a leading cause of cancer-related fatalities. While breast cancer affects both genders, it predominantly impacts women. In 2020, the International Agency for Research on Cancer (IARC) reported over 2.26 million new cases. By 2022, despite an estimated rise to over 2.31 million new cases, breast cancer ranked as the second most common cancer type, following lung cancer (WHO, 2024). The Global Burden of Cancer (GLOBOCAN) 2022 report identifies breast cancer as the most prevalent cancer in Indonesia, with approximately 66.271 new cases, representing 16.2% of all cancer diagnoses in the country. It has a mortality rate of 9.3% with around 22.598 deaths attributed to it in the same year (Global Cancer Observatory, 2022). It originates from the unregulated proliferation of cells within the breast tissue, often culminating in the formation of a tumor capable of infiltrating adjacent tissues or metastasizing to other body parts (Smolarz et al., 2022).

In Indonesia, breast cancer has become a major public health concern, with rising incidence rates, particularly in urban areas like Jakarta. Notably, Jakarta has a higher cancer prevalence compared to other provinces in Indonesia, despite better access to healthcare services and the establishment of cancer treatment centers across the region (Gondhowiardjo et al., 2023). Factors such as genetic mutations, hormonal changes, lifestyle, physical activity, and environmental influences contribute to its development (Łukasiewicz et al., 2021).

Nutritional status is vital in both the management and prevention of breast cancer. Proper nutrition can enhance treatment efficacy and improve overall health, while malnutrition may worsen side effects, weaken the immune system, and slow recovery. Obesity and undernutrition both affect cancer risk by influencing hormone levels, insulin resistance, and inflammation. Overnutrition is linked to metabolic syndrome, while undernutrition is associated with higher mortality and poor treatment outcomes. Regular monitoring of patients' nutritional status and body mass index (BMI) is essential to optimize breast cancer care (Bering et al., 2014; De Cicco et al., 2019).

Breast cancer patients often face significant stress from accepting their diagnosis, undergoing regular treatments, managing side effects, and confronting an uncertain future. Also, for some patients, there will be challenges on their psychological such as anxiety, desperateness, low self-esteem, and fear of death (İzci et al., 2016). This creates not only a medical but also a profound emotional and psychological burden. Family support plays a crucial role in helping patients cope with these challenges. Comprehensive care systems are essential to address both the physical and mental health needs of breast cancer patients and their families, ensuring they receive holistic support throughout the disease (Dinapoli et al., 2021).

Family support encompasses various forms of assistance, such as emotional, informational, financial, and practical aid. Informational support involves offering guidance and advice, while financial help eases the burden of healthcare costs. Emotional support addresses psychological and spiritual needs, and instrumental assistance includes providing essentials like food and clothing (Friedman et al., 2010). By fostering a nurturing environment and encouraging open communication, families play a key role in enhancing the mental well-being as well as nutritional status of breast cancer patients, especially in Jakarta, where comprehensive support is essential for effective care.

Family support plays an essential role in shaping the nutritional status of breast cancer patients, particularly during treatment. Research shows that patients often depend on their families for dietary assistance, significantly impacting their food intake and overall health outcomes. Family members not only provide emotional support but also practical help with meal planning, preparation, and adherence to nutritional guidelines. When families are actively involved in the patient's nutritional care, it creates a collaborative atmosphere that encourages healthier eating habits and ensures adequate energy and protein intake, which are critical for recovery and maintaining health (Molassiotis et al., 2018; Utami et al., 2024).

This study aimed to explore the relationship between nutritional status and family support in breast cancer patients, while also providing an in-depth analysis of both factors. Specifically, it examined how different types of family support may influence patients' nutritional well-being, highlighting the role of family dynamics in patient care.

METHODS

This study employed a non-experimental, quantitative approach using a cross-sectional research design to examine the correlation between nutritional status and family support among breast cancer patients. Participants were selected through purposive sampling, targeting breast cancer patients who met specific criteria: a confirmed diagnosis by a physician and willingness to participate. Exclusion criteria included patients without family support and those with edema, as these factors could influence the study outcomes. Data collection involved two primary methods. First, participants completed a 36-item questionnaire to assess various aspects of family support and nutritional habits. Second, direct weight and height measurements were conducted following standardized protocols to calculate body mass index (BMI) based on WHO Asia Pacific Year 2000 guidelines. Measurements were taken at a consistent time of day, with participants instructed to wear light clothing, remove heavy accessories, and avoid heavy meals or strenuous physical activity beforehand to improve the accuracy and reliability of the anthropometric data collected and minimize the impact of daily fluctuation in weight variations. For data analysis, we utilized bivariate analysis, specifically the chi-square test, to explore the relationship between family

support and nutritional status, with a significance level set at $\alpha = 0.05$. Analyses were conducted using the Statistical Package for the Social Sciences (SPSS) version 20.0 to ensure precise and reliable results.

RESULT AND DISCUSSION

Based on Friedman, et al, all forms of family actions, behaviors, and acceptance to support each other in various aspects are called family support. Different forms of family support include information support in the form of advice and information; appreciation support as a kind of respect and feedback; emotional support in the form of attention, affection, and empathy; instrumental support as a kind of time, energy, and cost assistance to other family members (Friedman et al., 2010).

The demographic characteristics of the respondents (Table 1) reveal significant patterns relevant to breast cancer incidence and progression the majority of respondents were aged 50-60 years, aligning with global data indicating higher breast cancer prevalence among post-menopausal women, likely due to hormonal changes. The predominance of high educational attainment (93.5%) among respondents may reflect urban accessibility to healthcare and awareness, factors that can influence early detection and treatment.

The distribution of cancer stages, with 45.2% of respondents in Stage IIB, suggests a moderate delay in seeking medical attention, which underscores the importance of public health initiatives targeting early diagnosis. Additionally, the prevalent use of hormonal therapy corresponds with its efficacy in managing early-stage breast cancer, reinforcing the need for personalized treatment plans in this population. The data also reveal a notable trend in weight loss among respondents, with 74.2% experiencing a weight reduction of more than 4 kg within the past month, and 38.7% reporting similar weight loss over the past six months. These findings suggest a pattern of significant weight fluctuations, which could be linked to the physiological and psychological challenges faced by breast cancer patients undergoing treatment.

Table 1. Respondent Characteristic

Characteristics	Total	Percentage
Gender		
Female	31	100
Age		
<50 years old	11	35.5
50 – 60 years old	12	38.7
>60 years old	8	25.8
Education		
Low	2	6.5
High	29	93.5
Stadium		
IA	2	6.5
IB	1	3.2
IIA	9	29
IIB	14	45.2
IIIA	3	9.7
IIIB	2	6.5
Treatment		
Hormonal	13	41.9
Surgery	5	16.1
Symptomatic, Surgical, and Hormonal	7	22.6
Hormonal and Surgical	3	9.7
Symptomatic and Hormonal	1	3.2
Symptomatic and Surgical	2	6.5
Weight Loss in 1 Month		

Characteristics	Total	Percentage
No weight loss	4	12.9
0 – 4 kg	4	12.9
>4 kg	23	74.2
Weight Loss in 6 Months		
No weight loss	1	3.2
0 – 4 kg	18	58.1
>4 kg	12	38.7

Source: Primary Research Data

Most of the respondents are those who aged between 50-60 years old. This is in line with research conducted by Ng, et al where the age group between 50 and 64 years old in Yogyakarta has the greatest prevalence of breast cancer (Ng et al., 2023). Another study in the same city, Yogyakarta, shows that the age group between 51 and 60 years old has the highest prevalence around 46,92% of respondents (Putri, Tejo, Probowati, & W Siagian, 2022). The data is similar to the incidence in Japan, higher than South Korea and China, and lower than the United States and the United Kingdom (Kang et al., 2021; Li et al., 2016; Mizukoshi et al., 2020). These findings can be caused by hormonal changes that happen around this age, the likelihood of accumulating genetic mutations over time increase, and prolonged exposure to risk factors such as physical inactivity and diet.

This study finds that most respondents were diagnosed with breast cancer stage IIB around 45.2% of total respondents. This finding is not in line with the study of Ng, et al, which states that the most common stage is stage IV (Ng et al., 2023). This result may occur due to the author's research was limited to the community, while the findings of Ng, et al covered a province in Yogyakarta. The high incidence of stage IV is because patients tend to come to the doctor at an advanced stage rather than an early stage, which is often undiagnosed. The study conducted by Putri et al. (2022) found that the most diagnosed breast cancer occurs at stage III (Putri et al., 2022). The main cause of higher-stage detection is a lack of knowledge about breast cancer, especially its signs and symptoms. Other factors such as financial aspect, ignorance of their self-condition, and using complementary and alternative medicine (CAM) (Narisuari & Manuaba, 2020). However, according to Harbeck & Gnant (2017) and Wijayanti & Ladesvita (2023) stated that the stage of cancer is usually found as stage II because at this stage the size of cancer cells has measured more than 2 cm which can be seen as a lump.

Among the various cancer treatment options, hormonal therapy emerged as the most commonly utilized, accounting for 41.9% of the respondents. This finding may occur due to the predominance of breast cancer stages in the early stages. Martins et al. (2021) stated that hormone therapy is widely regarded as the most effective treatment for alleviating climacteric symptoms in breast cancer patients. Kumar et al. (2023) state that hormone therapy is commonly used in postoperative patients and is advised in hormone-receptor-positive (HR+) cases to reduce recurrence by up to 40% and reduce mortality rates. Mai et al. (2024) also report a similar finding, noting that hormone therapy has demonstrated excellent results with high survival rates and minimal recurrence. Another study from the Early Breast Cancer Trialists' Collaborative Group (EBCTCG) reported that postmenopausal women with early-stage breast cancer who received adjuvant hormonal therapy experienced a reduced risk of recurrence and improved overall survival (Early Breast Cancer Trialists' Collaborative Group, 2015).

Weight loss among breast cancer patients is a significant concern, particularly in the context of treatment and overall prognosis. This weight loss is often multifactorial, influenced by the disease itself, treatment side effects, and psychosocial stressors. Chemotherapy and hormonal therapy are known to cause appetite changes, nausea, and metabolic shifts that can contribute to weight loss (Salas et al., 2022). Moreover, the emotional burden of a cancer diagnosis, including anxiety and depression, may lead to reduced food intake or changes in eating habits (Di Meglio et al., 2020). An old study conducted by Caan et al. (2012) found that weight loss of more than or

equal to 10% is associated with an increased risk of mortality by 40% compared to those who maintain their weight (Caan et al., 2012). A systematic review by Lake et al. (2022) found that most breast cancer patients experience weight loss ranging between 3% to 12.5% of their baseline weight.

The duration of the intervention significantly influences weight loss. A 6-month intervention was associated with an average reduction of 1.7 kg, a 12-month intervention of 3.77 kg, and a 24-month intervention with approximately a 6.4% reduction in body weight (Lake, et al., 2022). This trend is particularly pronounced in patients with comorbid conditions or those diagnosed at later stages of cancer. Interestingly, two-thirds of breast cancer patients reported experiencing weight gain after treatment, which contrasts with the study suggesting that weight loss is more common. This discrepancy can be attributed to increased energy intake and decreased physical activity during treatment (Muhammad & Aziza, 2024). Managing such weight fluctuations requires a holistic approach that combines dietary counseling, psychological support, and customized physical activity programs to mitigate adverse effects and promote overall well-being.

Table 2 provides an overview of the level of family support available for breast cancer patients. The data indicate that most respondents (80.6%) received strong family support, which is likely influenced by their high levels of education. Educated families may better understand the disease's impact and provide meaningful support, both emotionally and practically. However, despite the high prevalence of strong family support, its role did not translate into significant differences in nutritional status, as highlighted in subsequent analyses. This finding points to the need for targeted interventions that go beyond family support to address other factors impacting nutritional outcomes, such as dietary counseling and physical activity programs.

Table 2. Overview of Family Support

Family Support	Total	%
Good	25	80.6
Moderate	6	19.4
Total	31	100

Source: Primary Research Data

The study's findings indicate that a substantial majority of respondents (80.6%) experienced good family support, likely due to the high education level of 29 respondent (93.5%) and their families. Higher education plays a vital role in enhancing knowledge about health issues, which can significantly impact the quality of family support provided to breast cancer patients. Patients or families with higher educational attainment tend to have better access to health information and resources, enabling them to offer more effective family support during treatment. Hasdianah et al. (2014) highlights that higher education can facilitate better knowledge acquisition (Hasdianah et al., 2014). Sari et al. (2019) report that educated family members are more likely to understand the complexities of cancer care, including the importance of adherence to treatment protocols such as chemotherapy. Also, family support is crucial for improving coping mechanisms and reducing anxiety levels among breast cancer patients, leading to better outcomes. Another study indicates that informed support not only enhances the psychological well-being of patients but also fosters a nurturing environment that can improve their overall quality of life during challenging times (Utami et al., 2024).

An overview of the nutritional status of breast cancer patients is presented in Table 3. The nutritional status data reveal an interesting divergence from expectations. While previous studies have often highlighted malnutrition as a concern in breast cancer patients, this study found that a significant majority (71%) were overweight. This discrepancy may be attributed to lifestyle changes, reduced physical activity, or weight gain as a side effect of treatment, particularly hormonal therapy. These findings emphasize the complexity of nutritional management in breast

cancer care and highlight the need for individualized dietary and exercise interventions to address these issues effectively.

The prevalence of overweight breast cancer patients in this study (71%) aligns with trends observed in other urbanized regions, where increased sedentary lifestyles and dietary patterns contribute to higher rates of overweight and obesity. A meta-analysis study by Nindrea et al. (2019) found that nutritional status above normal significantly correlated with breast cancer during the premenopausal period in Asian women. Another study by Fei et al. (2015) in China during the 2005-2009 period, found that the prevalence of breast cancer is higher in urban regions than in rural regions by about 2.3 times, with an average of 33/100.000 in urban regions and 14/100.000 in rural regions due to health insurance and inadequate health services. On the contrary, a study by Gao et al. (2016) found that rural regions have a higher prevalence of overweight/obese breast cancer patients than urban regions due to increased daily dietary fat, meat, and animal oil intake. Even with high income in some rural regions, they tend to allocate more of their budget to high-fat, calorie-dense foods instead of opting for a healthier diet (Gao et al., 2016). These findings underscore the importance of contextualizing nutritional interventions within the specific lifestyle patterns of urban populations like Jakarta.

Table 3. Overview of Nutritional Status

Nutritional Status	Total	%
Overweight	22	71
Normal	9	29
Total	31	100

Source: Primary Research Data

In Jakarta, family support dynamics may differ significantly from those in rural areas due to urbanization, smaller household sizes, and busy work schedules that limit family members' availability for direct caregiving. Conversely, rural families often have stronger traditional structures and extended family networks, which could provide more consistent support. These differences suggest that tailored approaches to family support and nutritional counseling are essential to address the unique challenges faced by patients in urban areas like Jakarta, where socioeconomic and lifestyle factors heavily influence health outcomes.

The nutritional status of breast cancer patients is critical for their overall health and quality of life, particularly during treatment. Research by Adam et al. (2023) indicates that malnutrition is prevalent among breast cancer patients, often exacerbated by the side effects of chemotherapy, which can lead to significant weight loss and nutrient deficiencies. This study found that 30.9% of participants experienced moderate malnutrition, while 25.8% faced severe malnutrition, both of which were negatively associated with overall quality of life score (Adam et al., 2023). Another study in Indonesia found that reported a high prevalence of malnutrition among breast cancer patients, with 68.2% at risk and 13.6% moderately malnourished, suggesting that nutritional interventions could enhance patient outcomes.

The studies mentioned above do not align with current findings that most respondents are overweight. This discrepancy highlights the complexity of nutritional impacts on health outcomes in this population. Some factors that may contribute to this result are side effects of breast cancer therapy which often lead to weight gain and changes in body composition, poor dietary habits, and reduced physical activity. For instance, a study found that 64.1% of breast cancer patients were overweight or obese, indicating a significant association between obesity and breast cancer. They also stated that enhanced nutritional status is correlated with better functional capacity and a reduction in symptoms, whereas malnutrition is associated with a decline in quality of life across various domains (Muhammad & Aziza, 2024).

Table 4 presents an outline of the relationship between family support and the nutritional status of breast cancer patients. The analysis of the relationship between family support and nutritional status reveals no statistically significant correlation ($p = 0.320$). While strong family

support is often assumed to positively influence nutritional habits, these findings suggest that other factors, such as individual metabolic changes, treatment side effects, and personal dietary habits, might play a more decisive role. This underscores the need for further research to identify additional determinants of nutritional status in breast cancer patients and develop holistic strategies that integrate family involvement with professional nutritional counseling and support.

Table 4. Analysis of the Relationship between Family Support and Nutritional Status of Breast Cancer Patients

Family Support	Nutritional Status				Total	<i>p-value</i>
	Overweight	%	Normal	%		
Good	19	78	6	22	25	0.320
Moderate	3	25	3	75	6	

Source: Primary Research Data

Good family support has been shown to significantly impact the nutritional status of breast cancer patients (Caesandri & Adiningsih, 2017). According to our research, there appears to be a connection between the level of family support and the nutritional well-being of individuals diagnosed with breast cancer. Among the 25 participants who reported having good family support, 19 respondents exhibited a higher body weight. Conversely, of the 6 respondents who reported moderate family support, only 3 respondents had a healthy weight. Families with higher levels of support can provide emotional and practical assistance, which enhances patients' adherence to nutritional recommendations.

As mentioned above, Utami et al. (2024) state that family support besides improving coping mechanisms and reducing anxiety levels, is also able to give better outcomes in nutritional status (Utami et al., 2024). However, another study focusing on the FOCUS (Family involvement effectiveness, Optimistic attitude, Coping effectiveness, Uncertainty reduction, and Symptoms management) program for family-based interventions in Iranian breast cancer patients primarily highlighted the importance of family support in coping strategies and psychological well-being rather than directly addressing nutritional status (Tabrizi & Alizadeh, 2018). Nonetheless, the overall consensus is that family support plays a pivotal role in enhancing the overall health and well-being of breast cancer patients, including their nutritional status.

The analysis indicated no significant relationship between family support and the nutritional status of breast cancer patients, with a *p*-value greater than 0.05. This challenges the expectation that stronger family support would directly correlate with better nutritional outcomes and highlights this population's multifaceted nature of nutritional health. Several confounding variables may contribute to this complexity. Socioeconomic status, for instance, likely plays a critical role in shaping nutritional outcomes which significantly influences access to nutritious foods and healthcare resources.

Higher socioeconomic status may mask the effects of family support by facilitating better access to dietary resources and medical care. One study conducted by Lusiatur et al. (2016) found that a strong socioeconomic foundation significantly influences an individual's awareness, willingness, and capacity to enhance their health. Among economic factors, income plays a critical role as a fundamental prerequisite for accessing healthcare services and improving overall well-being. Conversely, families with financial limitations may face challenges in providing adequate nutritional support and/or initial treatment which will lead to poorer nutritional outcomes which can adversely affect treatment efficacy and overall quality of life, even when emotional or practical support is present (Emerson et al., 2020; Kurniawan & Lugito, 2016).

Treatment-related factors further complicate the relationship between family support and nutrition. Chemotherapy, radiation, and hormonal therapies often lead to side effects such as nausea, appetite loss, and fatigue, directly affecting nutritional status and hindering a patient's ability to maintain proper nutritional intake, leading to fluctuations in weight and overall health

(Silva et al., 2023). Furthermore, hormonal therapies may result in metabolic changes that contribute to weight gain or loss, complicating efforts to standardize nutritional outcomes across patients (Gandhi & Das, 2019). The variability in treatment regimens among respondents introduces another layer of complexity. Patients undergoing more aggressive treatment protocols may experience greater nutritional challenges than those with less intensive therapies.

This variability can obscure the measurable impact of family support, as the primary determinants of nutritional status may shift based on treatment severity. Psychological factors also play a significant role. Stress, anxiety, and depression, common among breast cancer patients, can disrupt eating habits by reducing appetite or triggering unhealthy coping mechanisms, such as comfort eating (De Cicco et al., 2019; Dinapoli et al., 2021). These factors may also dampen the patient's motivation to adhere to nutritional recommendations, even when family support is present, underscoring the need for a holistic approach to care that addresses both emotional and physical health.

Healthcare providers play a crucial role in leveraging family support to enhance the health outcomes of breast cancer patients. To maximize the benefits of family involvement, medical professionals can implement strategies that integrate families into the care process. First, healthcare teams should provide structured education programs for families, focusing on the importance of nutrition, meal planning, and the management of treatment-related side effects. Such programs can equip families with practical skills and knowledge to support patients effectively. Second, multidisciplinary care teams, including dietitians, psychologists, and oncologists, should work collaboratively to develop personalized care plans that address both the patient's and family's needs. These plans could include family counseling sessions to improve communication and foster a supportive environment. Third, providers could encourage the use of support groups or community networks where families can share experiences and strategies for managing dietary and emotional challenges. By actively involving families in these interventions, healthcare providers can create a more comprehensive and supportive framework that not only improves nutritional outcomes but also enhances the overall well-being of breast cancer patients.

This study provides valuable insights, but several limitations must be acknowledged and addressed in future research. The cross-sectional design, while useful for identifying associations, limits causal inferences, as it only captures relationships at a single point in time. Future longitudinal studies could offer a more comprehensive understanding of how family support evolves throughout treatment and its cumulative impact on nutritional outcomes. Additionally, the relatively small sample size and geographic focus on Jakarta constrain the generalizability of the findings. Future research should aim to include larger, more diverse samples from multiple regions to improve representativeness.

The reliance on self-reported measures of family support introduces potential bias, as respondents' perceptions may not accurately reflect the actual extent or quality of support. Incorporating objective measures, such as direct observations or interviews with family members, could enhance the reliability of future studies. Employing a mixed-methods approach that integrates quantitative data with qualitative insights could also provide a deeper exploration of the dynamics between family support and nutritional health. Intervention-based research that combines family education with tailored nutritional counseling may help identify strategies to optimize the role of family support in improving health outcomes. Addressing these limitations will advance understanding of the complex factors influencing nutritional health in breast cancer patients and inform the development of holistic, patient-centered interventions.

CONCLUSION

The study found no significant correlation between nutritional status and family support among breast cancer patients undergoing treatment, suggesting that other factors such as age, education, income, and lifestyle may have a greater impact on their nutritional outcomes. While family support remains crucial for overall well-being and motivation, particularly in maintaining

or improving nutritional status, addressing these other factors is essential for a holistic approach to patient care. Further research is needed to explore the complex relationship between social support and nutritional health in breast cancer patients.

ACKNOWLEDGMENT

The researchers would like to express their deepest gratitude to the Cancer Information and Support Center (CISC) Jakarta for facilitating access to essential research samples from the breast cancer community. Their support has been instrumental in advancing scientific understanding and enhancing patient care.

REFERENCES

- Adam, R., Haileselassie, W., Solomon, N., Desalegn, Y., Tigeneh, W., Suga, Y., & Gebremedhin, S. (2023). Nutritional status and quality of life among breast Cancer patients undergoing treatment in Addis Ababa, Ethiopia. *BMC women's health*, 23(1), 428. <https://doi.org/10.1186/s12905-023-02585-9>
- Bering, T., Maurício, S. F., Silva, J. B. da, & Correia, M. I. T. D. (2014). Nutritional and metabolic status of breast cancer women. *Nutricion hospitalaria*, 31(2), 751–8. <https://doi.org/10.3305/nh.2015.31.2.8056>
- Caan, B. J., Kwan, M. L., Shu, X. O., Pierce, J. P., Patterson, R. E., Nechuta, S. J., Poole, E. M., et al. (2012). Weight change and survival after breast cancer in the after breast cancer pooling project. *Cancer epidemiology, biomarkers & prevention : a publication of the American Association for Cancer Research, cosponsored by the American Society of Preventive Oncology*, 21(8), 1260–71. <https://doi.org/10.1158/1055-9965.EPI-12-0306>
- Caesandri, S. D. P., & Adiningsih, S. (2017). PERANAN DUKUNGAN PENDAMPING DAN KEBIASAAN MAKAN PASIEN KANKER SELAMA MENJALANI TERAPI. *Media Gizi Indonesia*, 10(2), 157–165. <https://doi.org/10.20473/mgi.v10i2.157-165>
- De Cicco, P., Catani, M. V., Gasperi, V., Sibilano, M., Quaglietta, M., & Savini, I. (2019). Nutrition and Breast Cancer: A Literature Review on Prevention, Treatment and Recurrence. *Nutrients*, 11(7). <https://doi.org/10.3390/nu11071514>
- Dinapoli, L., Colloca, G., Di Capua, B., & Valentini, V. (2021). Psychological Aspects to Consider in Breast Cancer Diagnosis and Treatment. *Current Oncology Reports*, 23(3), 38. <https://doi.org/10.1007/s11912-021-01049-3>
- Early Breast Cancer Trialists' Collaborative Group. (2015). Aromatase inhibitors versus tamoxifen in early breast cancer: patient-level meta-analysis of the randomised trials. *The Lancet*, 386(10001), 1341–1352.
- Emerson, M. A., Golightly, Y. M., Aiello, A. E., Reeder-Hayes, K. E., Tan, X., Maduekwe, U., Johnson-Thompson, M., et al. (2020). Breast cancer treatment delays by socioeconomic and health care access latent classes in Black and White women. *Cancer*, 126(22), 4957–4966. <https://doi.org/10.1002/cncr.33121>
- Fei, X., Wu, J., Kong, Z., & Christakos, G. (2015). Urban-Rural Disparity of Breast Cancer and Socioeconomic Risk Factors in China. *PLOS ONE*, 10(2), e0117572. <https://doi.org/10.1371/journal.pone.0117572>
- Friedman, M. M., Bowden, V. R., & Jones, E. G. (2010). *Buku Ajar Keperawatan Keluarga: Riset, Teori & Praktik*. (A. Y. S. Hamid, Ed.) (5th ed.). Jakarta: EGC.
- Gandhi, N., & Das, G. (2019). Metabolic Reprogramming in Breast Cancer and Its Therapeutic Implications. *Cells*, 8(2), 89.
- Gao, Y., Huang, Y., Song, F., Dai, H., Wang, P., Li, H., Zheng, H., et al. (2016). Urban-rural disparity of overweight/obesity distribution and its potential trend with breast cancer among Chinese women. *Oncotarget*, 7(35), 56608–56618.

<https://doi.org/10.18632/oncotarget.10968>

- Global Cancer Observatory. (2022). *Indonesia Fact Sheet for Cancer 2022*. Lyon, France. Retrieved September 24, 2024, from <https://gco.iarc.who.int/media/globocan/factsheets/populations/360-indonesia-fact-sheet.pdf>
- Gondhowiardjo, S., Nurhidayat, W., Zhafirah, N. F., Jayalie, V. F., Sekarutami, S. M., Priharto, R. K., & Widyastuti. (2023). Cancer Profile in Jakarta: A 5-year Descriptive Study. *Open Access Macedonian Journal of Medical Sciences*, 11(E), 17–22. <https://doi.org/10.3889/oamjms.2023.8200>
- Harbeck, N., & Gnant, M. (2017). Breast cancer. *The Lancet*, 389(10074), 1134–1150.
- Hasdianah, Siyoto, S., & Nurwijayanti. (2014). *Gizi: Pemanfaatan Gizi, Diet, dan Obesitas* (1st ed.). Yogyakarta: Nuha Medika.
- İzci, F., İlğün, A. S., Fındıklı, E., & Özmen, V. (2016). Psychiatric Symptoms and Psychosocial Problems in Patients with Breast Cancer. *The journal of breast health*, 12(3), 94–101. <https://doi.org/10.5152/tjbh.2016.3041>
- Kang, S. Y., Lee, S. B., Kim, Y. S., Kim, Z., Kim, H. Y., Kim, H. J., Park, S., et al. (2021). Breast Cancer Statistics in Korea, 2018. *Journal of breast cancer*, 24(2), 123–137. <https://doi.org/10.4048/jbc.2021.24.e22>
- Kumar, T., Dutta, R. R., Thakre, S., Singh, A., Velagala, V. R., & Shinde, R. K. (2023). Resistance to Resilience: Understanding Post-surgical Hormone Therapy in Breast Cancer Care. *Cureus*, 15(10), e47869. <https://doi.org/10.7759/cureus.47869>
- Kurniawan, A., & Lugito, N. P. H. (2016). Nutritional Status and Quality of Life in Breast Cancer Patients in Karawaci General Hospital. *Indonesian Journal of Cancer*, 10(1), 1. <https://doi.org/10.33371/ijoc.v10i1.413>
- Lake, B., Damery, S., & Jolly, K. (2022). Effectiveness of weight loss interventions in breast cancer survivors: a systematic review of reviews. *BMJ Open*, 12(10), e062288. <https://doi.org/10.1136/bmjopen-2022-062288>
- Li, T., Mello-Thoms, C., & Brennan, P. C. (2016). Descriptive epidemiology of breast cancer in China: incidence, mortality, survival and prevalence. *Breast cancer research and treatment*, 159(3), 395–406. <https://doi.org/10.1007/s10549-016-3947-0>
- Łukasiewicz, S., Czezelewski, M., Forma, A., Baj, J., Sitarz, R., & Stanisławek, A. (2021). Breast Cancer-Epidemiology, Risk Factors, Classification, Prognostic Markers, and Current Treatment Strategies-An Updated Review. *Cancers*, 13(17). <https://doi.org/10.3390/cancers13174287>
- Lusiatun, Mudigdo, A., & Murti, B. (2016). The Effect of Self-Efficacy, Family Support, and Socio-Economic Factors on the Quality of Life of Patients with Breast Cancer at Dr. Moewardi Hospital, Surakarta. *Journal of Epidemiology and Public Health*, 01(03), 182–194.
- Mai, J. N., Ferdiaananda, M. R., Wiradiharja, M. N. H. R., Afiati, S. N., & Subangkit, M. A. F. (2024). Effectiveness of Endocrine Therapy in Luminal-A Breast Cancer Patients: A Literature Review. *Indonesian Journal of Global Health Research*, 6(4), 2297–2306. <https://doi.org/10.37287/ijghr.v6i4.3083>
- Martins, S. C., Araújo, M. A. M., Moura, J. P. M. de, Costa, A. C. M., Martins, J. S. R., & Pinheiro, M. B. S. T. (2021). Hormone Therapy and Breast Cancer: a literature review about the influence of hormonal treatment on neoplastic development. *REVISTA MÉDICA DE MINAS GERAIS*, 31.
- Di Meglio, A., Michiels, S., Jones, L. W., El-Mouhebb, M., Ferreira, A. R., Martin, E., Matias, M., et al. (2020). Changes in weight, physical and psychosocial patient-reported outcomes among

- obese women receiving treatment for early-stage breast cancer: A nationwide clinical study. *Breast (Edinburgh, Scotland)*, 52, 23–32. <https://doi.org/10.1016/j.breast.2020.04.002>
- Mizukoshi, M. M., Hossian, S. Z., & Poulos, A. (2020). Comparative Analysis of Breast Cancer Incidence Rates between Australia and Japan: Screening Target Implications. *Asian Pacific journal of cancer prevention: APJCP*, 21(7), 2123–2129. <https://doi.org/10.31557/APJCP.2020.21.7.2123>
- Molassiotis, A., Roberts, S., Cheng, H. L., To, H. K. F., Ko, P. S., Lam, W., Lam, Y. F., et al. (2018). Partnering with families to promote nutrition in cancer care: feasibility and acceptability of the PlcNIC intervention. *BMC palliative care*, 17(1), 50. <https://doi.org/10.1186/s12904-018-0306-4>
- Muhammad, N. N., & Aziza. (2024). Association of Nutritional Status with Quality of Life in Breast Cancer Patients on Chemotherapy. *Muhammadiyah Medical Journal*, 5(1), 9–19. <https://doi.org/10.24853/mmj.5.1.9-19>
- Narisuari, I. D. A. P. M., & Manuaba, I. B. T. W. (2020). Prevalensi dan gambaran karakteristik penderita kanker payudara di poliklinik bedah onkologi RSUP Sanglah, Bali, Indonesia tahun 2016. *Intisari Sains Medis*, 11(1), 183–189.
- Ng, B., Puspitaningtyas, H., Wiranata, J. A., Hutajulu, S. H., Widodo, I., Anggorowati, N., ... & Sripan, P. (2023). Breast cancer incidence in Yogyakarta, Indonesia from 2008–2019: A cross-sectional study using trend analysis and geographical information system. *Plos one*, 18(7), e0288073. <https://doi.org/10.1371/journal.pone.0288073>
- Nindrea, R. D., Aryandono, T., Lazuardi, L., & Dwiprahasto, I. (2019). Association of overweight and obesity with breast cancer during premenopausal period in Asia: A meta-analysis. *International Journal of Preventive Medicine*, 10(1), 192. <https://doi.org/10.4103/ijpvm.IJPVM 372 18>
- Putri, A. M., Tejo, J., Probowati, W., & W Siagian, J. (2022). The Association between The Patient's Age Groups with Stage, Grading, and Molecular Subtype of Breast Cancer. *Journal of Medicine and Health*, 4(2), 123–130. <https://doi.org/10.28932/jmh.v4i2.4554>
- Salas, S., Cottet, V., Dossus, L., Fassier, P., Ginhac, J., Latino-Martel, P., Romieu, I., et al. (2022). Nutritional Factors during and after Cancer: Impacts on Survival and Quality of Life. *Nutrients*, 14(14), 2958. <https://doi.org/10.3390/nu14142958>
- Sari, D. K., Dewi, R., & Daulay, W. (2019). Association Between Family Support, Coping Strategies and Anxiety in Cancer Patients Undergoing Chemotherapy at General Hospital in Medan, North Sumatera, Indonesia. *Asian Pacific Journal of Cancer Prevention*, 20(10), 3015–3019. <https://doi.org/10.31557/APJCP.2019.20.10.3015>
- Silva, R. J. G., Grippa, W. R., Neto, L. C. B. S., Enriquez-Martinez, O. G., Marcarini, J. A. C., Pessanha, R. M., Haraguchi, F. K., et al. (2023). Factors Associated with the Nutritional Status of Women with Non-Metastatic Breast Cancer in a Brazilian High Complexity Oncology Center. *Nutrients*, 15(23), 4961. <https://doi.org/10.3390/nu15234961>
- Smolarz, B., Nowak, A. Z., & Romanowicz, H. (2022). Breast Cancer—Epidemiology, Classification, Pathogenesis and Treatment (Review of Literature). *Cancers*, 14(10), 2569. <https://doi.org/10.3390/cancers14102569>
- Tabrizi, F. M., & Alizadeh, S. (2018). Family Intervention Based on the FOCUS Program Effects on Cancer Coping in Iranian Breast Cancer Patients: a Randomized Control Trial. *Asian Pacific Journal of Cancer Prevention*, 19(6), 1523–1528. <https://doi.org/10.22034/APJCP.2018.19.6.1523>
- Utami, M. R., Sanusi, S. R., & Lubis, R. (2024). Analysis of Family Support in Enhancing Life Quality among Breast Cancer Patients at Haji Adam Malik Central General Hospital Medan.

Contagion: Scientific Periodical Journal of Public Health and Coastal Health, 6(1), 504.
<http://dx.doi.org/10.30829/contagion.v6i1.19590>

WHO. (2024). Breast Cancer. *World Health Organization*. Retrieved September 24, 2024, from www.iarc.who.int/cancer-type/breast-cancer/

Wijayanti, S., & Ladesvita, F. (2023). Family Support System And The Body Image Of Breast Cancer Patients Undergoing Chemotherapy In Jakarta. *Indonesian Journal of Health Development*, 5(2), 90–101. <https://doi.org/10.52021/ijhd.v5i2.126>