MEDFARM: Jurnal Farmasi dan Kesehatan, Vol. 15, No. 1, 2026, Page 305-318
e-ISSN : 2715-9957
p-ISSN: 2354-8487

Assessing the Impact of Opioid Analgesics on Pain Intensity Among Breast Cancer Inpatients at Dharmais Cancer Hospital, Jakarta

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ABSTRACT

Pain is a major clinical problem among breast cancer patients and requires regular evaluation of analgesic effectiveness. This study aimed to evaluate the effectiveness of opioid analgesics in reducing pain intensity among breast cancer inpatients at Dharmais Cancer Hospital, Jakarta, in 2023. This observational retrospective study included 58 medical records selected by total sampling. Pain intensity was measured using the Numeric Rating Scale (NRS) before and after opioid therapy. Data were analyzed using univariate analysis, Wilcoxon signed-rank test, and Fisher's exact test. Most patients were aged 45–59 years (41.38%), had stage IV breast cancer (70.69%), and had hypertension as the most common comorbidity (38.89%). Morphine was the most frequently prescribed opioid (62.07%). Before therapy, most patients reported mild pain (NRS 2–3), whereas after therapy, the majority reported no pain (43.10%) or NRS 1 (37.93%). Overall, 54 patients (93.10%) experienced pain reduction, with a mean pain reduction of 76.1±1.92%, while only four patients (6.90%) showed no reduction in pain intensity. The Wilcoxon signed-rank test demonstrated a significant reduction in pain intensity following opioid therapy ($p < 0.001$). Bivariate analysis showed no significant associations between therapeutic effectiveness and patient demographic or clinical characteristics (all $p > 0.05$). Opioid analgesics were highly effective in reducing pain intensity among hospitalized breast cancer patients, supporting their continued use in routine clinical management of cancer pain.

Keywords: Breast Cancer; Cancer Pain; Opioid Analgesics; Pain Management; Therapeutic Effectiveness

Introduction

Breast cancer has the greatest epidemiological impact on women, affecting 2.1 million women annually, and is the leading cause of cancer death in women. In 2020, 2.3 million women were diagnosed with breast cancer, and 685,000 died globally, accounting for approximately 15% of all cancer deaths in women (Sung et al., 2021). In Indonesia, breast cancer is the most common cancer among women, with an incidence rate of 42.1 per 100,000 and a mortality rate of 16.6 per 100,000 in 2020 (Osborne et al., 2025). Indonesia is one of the countries with a high incidence of breast cancer, followed by Japan, Malaysia, the Philippines, Singapore, Sri Lanka, and Taiwan. Breast cancer in Indonesia is the type of cancer with the second-highest number of cases in women after cervical cancer (Widiana & Irawan, 2020).

Pain is a significant problem and one of the most distressing symptoms in breast cancer patients, negatively impacting functional status and quality of life. A painless lump is the first symptom in breast cancer patients. In advanced stages, breast cancer patients experience severe, excruciating pain due to the involvement of internal structures, such as muscles and ribs, with chest movement. The aetiology of pain in breast cancer is multifactorial and can be caused by the release of inflammatory mediators, progression (metastasis) to other tissues such as bone, muscle, and neural structures, and treatment-related pain. Pain can be chronic, acute, or breakthrough, occurring even after treatment. Furthermore, pain can occur after medical management. Chemotherapy causes sensory nerve degeneration, resulting in neuropathic pain, and radiation causes microvascular changes and nerve compression. Surgery can also cause pain if it damages the intercostobrachial nerve and forms a neuroma (Alhazmi et al., 2021; Lucia et al., 2021).

Effective pain management is a crucial component of palliative cancer care (Herawati & Pratiwi, 2018). The WHO Analgesic Ladder guidelines serve as the primary reference for pain management using analgesics (Schwinghammer et al., 2021; World Health Organization, 2018). Opioids remain the primary treatment of choice for moderate to severe cancer pain (Herawati & Pratiwi, 2018; Mestdagh et al., 2023; Schwinghammer et al., 2021). Opioids are the most common analgesics for cancer pain and are included in international guidelines recommended for background cancer pain (persistent and relatively constant pain that occurs at rest) (Caraceni & Shkodra, 2019) and breakthrough cancer pain (transient worsening of pain despite stable and well-controlled background cancer pain) (Fallon et al., 2018; Mawatari et al., 2022; Paice et al., 2023; World Health Organization, 2018).

Pain management in breast cancer patients requires a thorough patient evaluation and critical assessment of the pain. Careful assessment of pain characteristics is essential for effective management of pain in breast cancer patients, and patient-reported pain intensity is considered the gold standard for routine pain assessment. Furthermore, it is crucial to understand pain assessment techniques and determine the type of treatment (pharmacological or nonpharmacological). Other factors, including patient history, previous pain management, prognosis, comorbidities, risk of pain medication abuse, patient preferences, and other predictive factors, can also influence pain management for breast cancer (Alhazmi et al., 2021).

To date, evidence regarding the effectiveness of opioid analgesics among breast cancer patients in Indonesia remains limited. Most available studies have focused on general cancer pain management or opioid prescribing practices, whereas studies evaluating real-world pain reduction outcomes among hospitalized breast cancer patients are still scarce. Furthermore, the influence of clinical and demographic characteristics, such as age, cancer stage, comorbidities, opioid type, and dosage regimen, on pain management outcomes has not been adequately described in the Indonesian setting. The novelty of this study lies in the use of real-world clinical data from a national cancer referral hospital to evaluate opioid effectiveness alongside patient demographic and clinical characteristics, including cancer stage, comorbidities, opioid type, and dosage regimen. Therefore, this study aimed to evaluate the effectiveness of opioid therapy in mitigating pain intensity among hospitalized breast cancer patients. The results of this study are expected to provide context-specific evidence to support more comprehensive and individualized cancer pain management strategies.

Methodology

Research Design, Timeline, and Location

This study was designed as a quantitative observational study with a retrospective approach. The data used were secondary data sourced from patient medical records, which were then presented descriptively and analytically. Data collection was conducted in the medical records unit of Dharmais Cancer Hospital Jakarta, located at Jl. Letjen S. Parman No. 84-86, West Jakarta. The research process took place over a three-month period, from December 2024 to February 2025. This study received ethical approval from the Dharmais Cancer Hospital Research Ethics Committee under Number DP.04.03/11.5/273/2024 and a research permit from the Dharmais Cancer Hospital Clinical Research Unit under Number DP.04.03/D.XII/15941/2024.

Research Population and Sample

The population in this study was all breast cancer patients experiencing cancer pain in the Inpatient Unit of Dharmais Cancer Hospital during 2023. The sampling technique used was total sampling, where the entire population meeting the study criteria was taken as a sample. Based on this technique, 58 samples were obtained that met the established criteria.

The inclusion criteria for the sample were as follows:

a. Female patients diagnosed with breast cancer and with complete medical records.
b. Patients with recorded Numeric Rating Scale (NRS) results before and after receiving opioid analgesic therapy.
c. Patients receiving opioid analgesic therapy, either as a single therapy or in combination.
d. Meanwhile, the exclusion criteria applied were:
    - Patients diagnosed with other types of cancer besides breast cancer.
    - Patients who had undergone surgical procedures such as lumpectomy and/or mastectomy, or other surgeries.
    - Patients with comorbidities that could trigger sudden pain.
    - Patients with acute painful conditions unrelated to breast cancer, such as fractures, acute trauma, postoperative pain, or other conditions that could independently alter pain assessment.

Therapeutic effectiveness was operationally defined as a decrease in pain intensity after opioid analgesic administration, measured using the Numeric Rating Scale (NRS). Therapy was categorized as effective when the post-therapy NRS score was lower than the pre-therapy NRS score. Therapy was categorized as ineffective when there was no reduction in the NRS score after opioid administration. The percentage of pain reduction was calculated using the following formula:

Pain reduction (%) = [(pre-therapy NRS − post-therapy NRS) / pre-therapy NRS] × 100.

Data Analysis

Data analysis was conducted using univariate and bivariate analyses. Univariate analysis was used to describe patient characteristics, opioid use, pain intensity, and therapeutic effectiveness. Bivariate analysis was performed to evaluate the association between patient characteristics and therapeutic effectiveness using Chi-

square or Fisher's exact test, as appropriate. The Wilcoxon signed-rank test was used to compare pre- and post-therapy NRS scores. A p-value <0.05 was considered statistically significant.

Result and Discussion

Table 1. Patient Characteristics Based on Age

Age	Total (N=58)	
	Number (n)	Percentage (%)
Adolescents (10-18 years)	1	1.72
Adults (19-44 years)	22	37.93
Middle-aged adults (45-59 years)	24	41.38
Elderly (> 60 years)	11	18.97

Breast cancer patients at Dharmais Cancer Hospital in Jakarta in 2023 were predominantly pre-elderly, aged 45–59 years, at 41.38% (**Table 1**). As women age, their risk of developing breast cancer increases by 2.18 times compared to younger women aged 20–29 years (Awaliyah et al., 2017; McGuire et al., 2015). The age-related risk factor for cancer can be explained by the theory that gene mutations can cause cancer and the immune system. Furthermore, hormonal factors that occur with ageing are considered to be contributing factors to cancer (Hermawan & Djamaludin, 2016). Exposure to oestrogen and progesterone, which affect the breasts, is considered an age-related risk factor for breast cancer. One of the functions of oestrogen is to stimulate the production of growth factors, such as transforming growth factor alpha, platelet-derived growth factor, and fibroblast growth factor. This goal is achieved through autocrine and paracrine mechanisms. The hormone oestrogen causes proliferation during cancer development, from precursor lesions to malignant carcinoma and metastasis (McGuire et al., 2015; Yulianti et al., 2016). The results of this study are strongly supported by research conducted by (Az Zahra et al., 2024; Susanti et al., 2024) which found that patients aged 45-59 years have the highest proportion. Another study (Mochtar et al., 2024) showed that the majority of breast cancer respondents at Dr Soedomo Trenggalek Regional General Hospital during the 2020-2021 period were patients over the age of 40, comprising 34 patients (94.4%), while those under 40 years old accounted for 5.6% or 2 patients.

Table 2. Patient Characteristics Based on Breast Cancer Stage

Stages	Total (N=58)	
	Number (n)	Percentage (%)
Stage IB	1	1.72
Stage IIA	2	3.45
Stage IIB	1	1.72
Stage IIIA	1	1.72
Stage IIIB	8	13.80
Stage IIIC	4	6.90
Stage IV	41	70.69

Patient characteristics based on breast cancer stage in this study were found to be 70.69% in stage IV (**Table 2**). Breast cancer patients with higher stages will experience more severe pain due to tumoor infiltration. This scenario also applies to patients who have experienced metastasis, where the higher stage can cause damage to visceral organs and the bone skeleton, resulting in chronic visceral pain or bone cancer pain (Bernadetha & Sriyati, 2024). More than 70% of breast cancer patients are diagnosed at an advanced stage. Stages III and IV are classified as advanced in

cancer patients (Wawolumaja et al., 2019). The results of this study are in line with research conducted by (Van Den Beuken-van Everdingen et al., 2016) which indicated that the prevalence of cancer pain experienced by patients with advanced stages or metastasis was 66.4%. Patients with advanced stages will experience an increasing prevalence of pain as the disease progresses (Bennett et al., 2025). The results of this study are supported by research conducted by (Wongkar et al., 2022), which showed that 70% of the symptoms experienced by stage IV cancer patients were pain. Pain is often experienced by cancer patients, especially those in advanced stages, where the prevalence is estimated to be over 70% (V. Subramaniam et al., 2019). Research conducted by (Siregar & Fadinie, 2025) at Haji Adam Malik General Hospital in 2019 showed that 71.8% of breast cancer patients experienced advanced stages.

Table 3. Patient Characteristics Based on Comorbidities

Comorbidities	Total (F=72)	
	Frequency (f)	Percentage (%)
With comorbidities:		
Hypertension	28	38.89
Diabetes mellitus	8	11.11
Pneumonia	5	6.94
Gout	4	5.56
Hypercholesterolemia	3	4.17
Coronary Artery Disease	1	1.39
Chronic Hepatitis C	1	1.39
Without comorbidities	22	30.56

In this study, the majority of breast cancer patients with cancer pain at the Inpatient Unit of Dharmais Cancer Hospital Jakarta in 2023 had hypertension as a comorbidity, amounting to 38.89% (**Table 3**). Research conducted by (Park et al., 2025) showed that approximately 56.8% of cancer patients treated in the hospital had hypertension as a comorbidity. Hypertension is the most common comorbidity experienced by cancer patients. The results of this study are also supported by research conducted by (Nicoline Naomy Lamria & Heru Sutanto Koerniawan, 2024) at Siloam Lippo Village Hospital, which stated that hypertension is not only a comorbidity but also has the potential to contribute to the development of breast cancer. Hypertension can worsen pain perception in breast cancer patients through several physiological mechanisms, where increased blood pressure and vascular damage due to hypertension can cause impaired tissue perfusion and trigger chronic inflammation, which can then amplify pain signals. Furthermore, hypertension can increase the production of reactive oxygen species (ROS), which cause oxidative stress, increasing peripheral and central nervous system sensitivity. This condition, therefore, makes cancer pain experienced by patients more intense and difficult to control (Deswindra et al., 2020).

Table 4. Patient Characteristics Based on Pain Scale

Pain Scale Before Administration Opioid Analgesics	Total (N=58)	
	Number (n)	Percentage (%)
Scale 1	3	5.17
Scale 2	25	43.10
Scale 3	16	27.59
Scale 4	6	10.35
Scale 5	1	1.72
Scale 6	1	1.72
Scale 7	3	5.17

Scale 8	2	3.45
Scale 9	1	1.72

Pain measurement is highly subjective because the level of pain experienced by each person varies. Generally, the standard parameter used to measure a pain scale or pain intensity is the Numeric Rating Scale (NRS) (Vebrianti et al., 2023). The results in **Table 4** show the distribution of patient characteristics based on the pain scale before opioid analgesic administration, indicating that the majority of patients experienced pain on a scale of 2 (43.10%). Breast cancer patients generally experience several symptoms, one of which is the appearance of a lump growing in the breast that can gradually cause pain. The main complaint often reported of by breast cancer patients is pain. Mild pain is generally experienced by breast cancer patients in the early stages; such discomfort occurs because the tumour and tissue damage are still limited, so the pain stimulus is relatively small (Siregar & Fadinie, 2025).The results obtained are in line with research conducted (Bernadetha & Sriyati, 2024) at the Yogyakarta City Hospital, which indicated that the majority of respondents had mild pain levels, namely a scale of 1-3. The study also indicated that some patients (13 people) continued to report mild pain even though the cancer was in an advanced stage. This is related to the location and metastasis that affect the nerves, where tumours that metastasise in areas with low pain sensitivity will interpret mild pain even though the patient is diagnosed at an advanced stage. Research conducted by (Sari et al., 2024) also had similar results, stating that most participants experienced pain on a scale of 1-3, which can be called mild pain. This effect occurs because past experiences can influence the pain scale so that when severe pain stimuli occur that originate from the past, there is almost no reaction at all (Butar-Butar et al., 2015).

Table 5. Therapy Profile Based on Opioid Analgesic Type

Opioid Analgesic	Total (N=58)	
	Number (n)	Persentage (%)
Morphine	36	62.07
Fentanyl	11	18.96
Tramadol	10	17.24
Codeine	1	1.72

Table 6. Therapeutic Profile Based on Opioid Analgesic Dosage Regimen

Analgesic Dosage Regimen Opioid	Total (N=58)	
	Number (n)	Persentage (%)
Morphine PO dose 10-30 mg	20	34.48
Morphine IM/IV dose 10-20 mg	16	27.59
Tramadol IV dose 50-112.5 mg	10	17.24
Transdermal Fentanyl dose 12.5-100 □g	7	12.07
IM/IV fentanyl dose 0.05-0.075 mg	4	6.90
Codeine PO dose 15-30 mg	1	1.72

Table 5 shows that in 2023, the majority of opioid analgesics used at Dharmais Cancer Hospital in Jakarta were morphine (62.07%), while **Table 6** displays the distribution of opioid analgesic therapy profiles based on dosage regimens, dominated by PO morphine at a dose of 10-30 mg (34.48%). Research conducted at Haji Adam Malik General Hospital in Medan by Ritonga et al. (2017) aligns with this study because it shows that morphine can reduce the pain scale from 7 to 3, while also explaining that administering morphine-type opioid analgesics can improve the quality of life of cancer patients and reduce the cancer pain experienced by patients.

Morphine is recommended as a first-line opioid for cancer pain due to its availability in various formulations and is classified as a relatively low-cost opioid. However, its use needs to be adjusted to the patient's condition, especially for patients with impaired kidney function and the elderly (Hawley, 2021).

Morphine was the most frequently prescribed opioid in this study, accounting for 62.07% of all opioid prescriptions. This prescribing pattern is consistent with international cancer pain guidelines, which recommend morphine as the first-line strong opioid for moderate-to-severe cancer pain because of its well-established efficacy, multiple dosage formulations, wide availability, and relatively affordable cost (Hawley, 2021) (Paice et al., 2023). The predominance of oral morphine regimens observed in this study further suggests that many hospitalized patients were clinically stable enough to receive oral opioid therapy while maintaining adequate pain control. Therefore, the high utilization of morphine in this study likely reflects both adherence to evidence-based clinical guidelines and routine prescribing practices at a national cancer referral hospital (Heri & Subarnas, 2019).

Table 7. Distribution of NRS Scores Before and After Opioid Analgesic Therapy

NRS Score	Before therapy n (%)	After therapy n (%)
0	0 (0.00)	25 (43.10)
1	3 (5.17)	22 (37.93)
2	25 (43.10)	6 (10.34)
3	16 (27.59)	4 (6.90)
4	6 (10.35)	0 (0.00)
5	1 (1.72)	1 (1.72)
6	1 (1.72)	0 (0.00)
7	3 (5.17)	0 (0.00)
8	2 (3.45)	0 (0.00)
9	1 (1.72)	0 (0.00)

Table 8. Effectiveness of Opioid Analgesics Based on Pain Scale

Pain Scale Reduction (%)	Total (N=58)		Mean± SD
	Number (n)	Persentage (%)	
0	4	6.90	
25	2	3.45	
33	2	3.45	
38	1	1.72	
50	12	20.69	
67	6	10.34	76.1 ± 1.92
71	1	1.72	
75	1	1.72	
86	2	3.44	
88	1	1.72	
100	25	43.10	

The results presented in **Tables 7** and **8** demonstrate that opioid analgesic therapy substantially reduced pain intensity among hospitalized breast cancer patients. Before treatment, most patients reported mild pain, particularly NRS scores of 2 (43.10%) and 3 (27.59%), whereas after opioid administration, the distribution shifted markedly toward lower pain scores, with 43.10% of patients reporting no pain (NRS 0) and 37.93% reporting NRS 1. This marked shift in NRS distribution indicates that opioid therapy effectively relieved pain in the majority of patients.

Consistent with these findings, **Table 8** shows that 54 of 58 patients (93.10%) experienced a reduction in pain intensity, with a mean pain reduction of 76.1± 1.92%. Notably, 43.10% of patients achieved complete pain relief (100% pain reduction), while only 6.90% showed no reduction in pain intensity following opioid therapy. These findings suggest that opioid analgesics provide substantial clinical benefits in controlling cancer-related pain among hospitalized breast cancer patients in routine clinical practice.

The significant improvement in pain intensity was further confirmed by the Wilcoxon signed-rank test **(Table 9)**, which demonstrated a statistically significant reduction in NRS scores after opioid therapy ($p < 0.001$). This finding supports current international guidelines recommending opioid analgesics as the standard treatment for moderate-to-severe cancer pain and indicates that opioid therapy remains highly effective when appropriately prescribed and monitored in a tertiary oncology setting (Hawley, 2021) (Paice et al., 2023).

Table 9. Wilcoxon Test Results for Pain Intensity Reduction Before and After Opioid Administration

Uji *Wilcoxon*	p
Z	< 0.001
Asymp. Sig. Two-tailed	< 0.001

Table 10. Bivariate Analysis of Factors Associated with Therapeutic Effectiveness

Variable	Effective		Ineffective		p-value
	n	%	n	%	
Age group:					
Adolescents	1	100,0	0	0.0	0.522
Adults	21	95.5	1	4.5	
Pre-elderly	21	87.5	3	12.5	
Elderly	11	100	0	0.0	
Stage:					
Stage I–III	15	88.2	2	11.8	0.573
Stage IV	39	95.1	2	4.9	
Comorbidity status:					
With comorbidity	32	88.9	4	11.1	0.287
Without comorbidity	22	100.0	0	0.0	
Opioid type:					
Morphine	33	91.7	3	8.3	0.764
Fentanyl	11	100.0	0	0.0	
Tramadol	9	90.0	1	10.0	
Codeine	1	100.0	0	0.0	
Baseline pain intensity:					
Mild	40	90.9	4	9.1	0.505
Moderate	8	100.0	0	0.0	
Severe	6	100.0	0	0.0	
WHO therapy appropriateness:					
Appropriate	9	100.0	0	0.0	1.000
Inappropriate	45	91.8	4	8.2	

Bivariate analysis showed that age group, cancer stage, comorbidity status, opioid type, baseline pain intensity, and WHO therapy appropriateness were not significantly associated with therapeutic effectiveness (all $p > 0.05$). Although all ineffective cases occurred among patients with comorbidities and among those

receiving therapy that was not fully consistent with WHO recommendations, these associations did not reach statistical significance. The absence of statistically significant associations may be explained by the overwhelmingly high therapeutic response rate (93.1%) and the very small number of ineffective cases (n = 4), which limited variability between comparison groups and reduced statistical power.

Despite these findings, the present study demonstrated that opioid analgesic therapy was highly effective in reducing pain intensity among hospitalized breast cancer patients. A marked shift in NRS distribution was observed after treatment, with most patients reporting NRS scores of 2–3 before therapy and NRS scores of 0–1 after therapy. Overall, 54 of 58 patients (93.10%) experienced a reduction in pain intensity, with a mean pain reduction of 76.1±1.92%. These findings indicate that opioid analgesics provide substantial clinical benefits for cancer pain management in routine clinical practice at a national cancer referral hospital.

Morphine was the most frequently prescribed opioid, accounting for 62.07% of all opioid prescriptions. This finding is likely related to the patient profile observed in this study, where 70.69% of patients had stage IV breast cancer and therefore required strong opioid analgesics for persistent cancer-related pain. In addition, morphine remains the first-line strong opioid recommended by the WHO Analgesic Ladder and international cancer pain guidelines because of its proven efficacy, wide availability, multiple dosage forms, and relatively affordable cost compared with other opioid options. The predominance of oral morphine regimens (34.48%) further suggests that many patients were still able to receive oral therapy, making morphine a practical option for pain management in hospitalized breast cancer patients.

Although most patients experienced pain improvement, 6.90% of patients showed no reduction in NRS score after opioid therapy. Interestingly, all ineffective cases occurred among patients with comorbidities and among patients whose therapy was categorized as inappropriate according to WHO recommendations. Although these associations were not statistically significant, likely because only four patients were classified as having ineffective therapy, the findings suggest that inadequate pain control may be influenced by factors beyond opioid selection alone. Comorbid conditions may contribute to more complex pain mechanisms, including inflammatory or neuropathic components, which are often less responsive to opioid monotherapy and may require multimodal pain management approaches.

Another important finding was that cancer stage was not significantly associated with opioid effectiveness ($p = 0.573$). Interestingly, the proportion of effective pain control was slightly higher among stage IV patients (95.1%) than among patients with stage I–III disease (88.2%). Although advanced-stage cancer is generally associated with greater pain burden due to tumor progression and metastasis, these results suggest that opioid therapy remains effective even in advanced disease when appropriately prescribed and monitored.

Hypertension was the most common comorbidity, affecting 38.89% of patients. Although comorbidity status was not significantly associated with therapeutic effectiveness ($p = 0.287$), all cases of ineffective therapy occurred among patients with at least one comorbidity. This observation suggests that comorbid diseases may complicate pain management and potentially influence treatment outcomes. Patients with hypertension often experience chronic inflammation, vascular dysfunction, and polypharmacy, which may affect pain perception and response to analgesic therapy. However, because the current study was not specifically designed to evaluate the effect of individual comorbidities, further studies are needed to clarify this relationship.

This study has several limitations. First, the retrospective design relied on the completeness and accuracy of medical record documentation, particularly NRS assessment before and after opioid administration. Second, this study was conducted in a single national cancer referral hospital; therefore, the findings may not be fully generalizable to other hospitals or broader Indonesian clinical settings. Third, the sample size was limited to the number of eligible medical records available during the study period, and only four patients were categorized as having ineffective therapy. Consequently, the statistical power of the bivariate analyses was limited, and small associations may not have been detected. Fourth, several clinically relevant factors that may influence opioid effectiveness, such as opioid-related adverse effects, timing of pain reassessment, duration of opioid use, adjuvant analgesic therapy, cancer metastasis site, and non-pharmacological pain management, were not consistently documented in the medical records and therefore could not be evaluated in this study. Therefore, future prospective multicenter studies are needed to provide stronger evidence regarding opioid effectiveness and its influencing factors among breast cancer patients.

Conclusion

This study showed that opioid analgesics were significantly effective in reducing pain intensity among breast cancer inpatients at Dharmais Cancer Hospital, Jakarta, in 2023. Most patients were aged 45–59 years (41.38%), had stage IV breast cancer (70.69%), and had hypertension as the most common comorbidity (38.89%). Morphine was the most frequently used opioid (62.07%). After opioid therapy, 54 of 58 patients (93.10%) experienced a reduction in NRS score, while 4 patients (6.90%) showed no reduction. The distribution of NRS scores shifted from predominantly NRS 2–3 before therapy to predominantly NRS 0–1 after therapy. The Wilcoxon test confirmed a significant reduction in pain intensity after opioid administration ($p < 0.001$). However, bivariate analyses did not identify any patient or therapy-related factor significantly associated with therapeutic effectiveness. Further prospective multicenter studies with larger sample sizes are recommended.

Declaration of Competing Interest

The authors declare that they have no competing interests.

Reference

Adamczyk, K., Zuzda, K., Jankowski, M., Świerczyński, R., Chudziński, K., Czapski, B., & Szułdrzyński, K. (2025). Effects of Opioids in Cancer Pain: An Interplay Among Genetic Factors, Immune Response, and Clinical Outcomes—A Scoping Review. *Cancers*, *17*(5), 863. https://doi.org/10.3390/cancers17050863

Alhazmi, L. S. S., Bawadood, M. A. A., Aljohani, A. M. S., Alzahrani, A. A. R., Moshref, L., Trabulsi, N., & Moshref, R. (2021). Pain Management in Breast Cancer Patients: A Multidisciplinary Approach. *Cureus*. https://doi.org/10.7759/cureus.15994

Angkejaya, O. (2018). Opioid. *Molucca Medica*, *11*(1), 79–95.

Awaliyah, N., Pradjatmo, H., & Kusnanto, H. (2017). Penggunaan kontrasepsi hormonal dan kejadian kanker payudara di rumah sakit Dr. Sardjito. *Berita Kedokteran Masyarakat (BKM Journal of Community Medicine and Public Health)*, *33*(10), 487–494.

Az Zahra, J., Santosa, A., & Do Toka, W. (2024). Karakteristik Klinikopatologi Karsinoma Duktal Invasif di Maluku Utara. *Malahayati Nursing Journal*, *6*(9), 3753–3764. https://doi.org/10.33024/mnj.v6i9.14419

Bennett, M., Paice, J. A., & Wallace, M. (2025). *Pain and Opioids in Cancer Care: Benefits, Risks, and Alternatives* (3rd ed., Vol. 45). American Society of Clinical Oncology Educational Book.

Bernadetha, S., & Sriyati, S. (2024). Hubungan Stadium dengan Derajat Nyeri pada Pasien Ca Mammae di RSUD Kota Yogyakarta. *Prosiding Seminar Nasional Penelitian dan Pengabdian Kepada Masyarakat LPPM Universitas 'Aisyiyah Yogyakarta*, *2*.

Butar-Butar, D., Yustina, I., & Harahap, I. A. (2015). Hubungan Karakteristik Nyeri Dengan Kecemasan Pada Pasien Kanker Payudara Yang Menjalani Kemoterapi Di RSUD Dr. Pirngadi Medan. *Idea Nursing Journal*, 51–60.

Caraceni, A., & Shkodra, M. (2019). Cancer Pain Assessment and Classification. *Cancers*, *11*(4), 510. https://doi.org/10.3390/cancers11040510

Corli, O., Floriani, I., Roberto, A., Montanari, M., Galli, F., Greco, M. T., Caraceni, A., Kaasa, S., Dragani, T. A., Azzarello, G., Luzzani, M., Cavanna, L., Bandieri, E., Gamucci, T., Lipari, G., Di Gregorio, R., Valenti, D., Reale, C., Pavesi, L., … Molinari, E. (2016). Are strong opioids equally effective and safe in the treatment of chronic cancer pain? A multicenter randomized phase IV 'real life' trial on the variability of response to opioids. *Annals of Oncology*, *27*(6), 1107–1115. https://doi.org/10.1093/annonc/mdw097

Deswindra, M. R., Muhartono, M., Hanriko, R., & Rudiyanto, W. (2020). Hubungan Antara Hipertensi dan Usia dengan Angka Kejadian Kanker Payudara Di RSUD Dr. H. Abdul Moeloek Bandar Lampung Tahun 2018. *Medula*, *10*(1), 11–15.

Faisal, E., Puspadina, S., Putranto, R., & Shatri, H. (2022). Efektivitas Rotasi Opioid Dibandingkan Kombinasi Opioid untuk Mengobati Nyeri Kanker: Laporan Kasus Berbasis Bukti. *Jurnal Penyakit Dalam Indonesia*, *9*(2), 114. https://doi.org/10.7454/jpdi.v9i2.736

Fallon, M., Giusti, R., Aielli, F., Hoskin, P., Rolke, R., Sharma, M., & Ripamonti, C. I. (2018). Management of cancer pain in adult patients: ESMO Clinical Practice Guidelines. *Annals of Oncology*, *29*, iv166–iv191. https://doi.org/10.1093/annonc/mdy152
Hawley, P. (2021). Management of cancer pain with opioids. *BC MEDIC AL JOURNAL*, *63*(9), 372–376.

Herawati, F., & Pratiwi, V. F. (2018). Penggunaan Analgesik untuk Perawatan Paliatif Pasien Kanker di Poli Paliatif Puskesmas di Kota Surabaya. *MPI (Media Pharmaceutica Indonesiana)*, *2*(1), 13–21. https://doi.org/10.24123/mpi.v2i1.1298

Heri, A. A. P., & Subarnas, A. (2019). Morfin: Penggunaan Klinis Dan Aspek-Aspeknya. *Farmaka*, *17*(3), 134–141.

Hermawan, D., & Djamaludin, D. (2016). Kejadian Kanker Payudara Dilihat Dari Faktor Usia, Menstruasi Dini Dan Penggunaan Alat Kontrasepsi. *Jurnal Kesehatan Holistik (The Journal of Holistic Healthcare)*, *10*(2), 45–53.

Lucia, M., Luca, T., Federica, D. P., Cecilia, G., Chiara, M., Laura, D. M., Carlo, D. R., & Grazia, P. M. (2021). Opioids and Breast Cancer Recurrence: A Systematic Review. *Cancers*, *13*(21), 5499. https://doi.org/10.3390/cancers13215499

Mashayekhi-Sardoo, H., Mohammadpour, A. H., Nomani, H., & Sahebkar, A. (2019). The effect of diabetes mellitus on pharmacokinetics, pharmacodynamics and adverse drug reactions of anticancer drugs. *Journal of Cellular Physiology*, *234*(11), 19339–19351. https://doi.org/10.1002/jcp.28644

Mawatari, H., Shinjo, T., Morita, T., Kohara, H., & Yomiya, K. (2022). Revision of Pharmacological Treatment Recommendations for Cancer Pain: Clinical Guidelines from the Japanese Society of Palliative Medicine. *Journal of Palliative Medicine*, *25*(7), 1095–1114. https://doi.org/10.1089/jpm.2021.0438

McGuire, A., Brown, J., Malone, C., McLaughlin, R., & Kerin, M. (2015). Effects of Age on the Detection and Management of Breast Cancer. *Cancers*, *7*(2), 908–929. https://doi.org/10.3390/cancers7020815

Mestdagh, F., Steyaert, A., & Lavand'homme, P. (2023). Cancer Pain Management: A Narrative Review of Current Concepts, Strategies, and Techniques. *Current Oncology*, *30*(7), 6838–6858. https://doi.org/10.3390/curroncol30070500

Mochtar, N. M., Aisy, L. R., Irawati, D. N., & Finansah, Y. W. (2024). Hubungan Faktor Genetik dan Faktor Usia terhadap Kejadian Kanker Payudara pada Wanita di RSUD Dr.Soedomo Trenggalek Periode 2020-2021. *JurnalMU: Jurnal Medis Umum*, *1*(3), 175–184. https://doi.org/10.30651/jmu.v1i3.24772

Nicoline Naomy Lamria & Heru Sutanto Koerniawan. (2024). Hubungan Antara Obesitas dan Hipertensi dengan Kanker Payudara pada Pasien di Rumah Sakit Siloam Lippo Village Gedung B. *MEDICINUS*, *37*(2), 13–19. https://doi.org/10.56951/t7vk9k12

Nugraha, A. F., Mahmud, & Wisudarti, C. F. R. (2023). Penatalaksanaan Paliatif Pasien Dengan Nyeri Kanker. *Jurnal Komplikasi Anestesi*, *4*(1), 71–89. https://doi.org/10.22146/jka.v4i1.7268

Osborne, A., Adnani, Q. E. S., & Ahinkorah, B. O. (2025). Breast cancer incidence in Indonesia: A sex-disaggregated analysis using WHO health equity assessment toolkit data. *BMC Cancer*, *25*(1), 986. https://doi.org/10.1186/s12885-025-14332-4

Paice, J. A., Bohlke, K., Barton, D., Craig, D. S., El-Jawahri, A., Hershman, D. L., Kong, L. R., Kurita, G. P., LeBlanc, T. W., Mercadante, S., Novick, K. L. M., Sedhom, R., Seigel, C., Stimmel, J., & Bruera, E. (2023). Use of Opioids for Adults With Pain From Cancer or

Cancer Treatment: ASCO Guideline. *Journal of Clinical Oncology*, *41*(4), 914–930. https://doi.org/10.1200/JCO.22.02198

Park, C., Han, S., Litten, K. P., Mehta, S., & Ng, B. P. (2025). Prevalence of primary and secondary hypertension among hospitalized patients with cancer in the United States. *Chronic Illness*, *21*(1), 42–55. https://doi.org/10.1177/17423953231196613

Sari, N., Jurwita, L., Veriana, C., & Nurlaili, N. (2024). Pengalaman Pasien Kanker Payudara Yang Mengalami Nyeri Ringan Dalam Menerima Massage Aromaterapi Lavender: Studi Fenomenologi. *Multidisiplinary*, *2*(8), 2377–2386.

Schwinghammer, T., DiPiro, J., Ellingrod, V., & DiPiro, C. (2021). *Pharmacotherapy Handbook* (11th ed.). McGraw Hill.

Seangrung, R., Ahuja, M., Pasutharnchat, K., & Mahawan, R. (2021). Factors influencing non-adherence to opioids in cancer patients: A mixed-methods cross-sectional study [version 2; peer review: 2 approved]. *F1000Research*, *9*(1471), 1–14. https://doi.org/10.12688/f1000research.27725.2

Sempere-Bigorra, M., Julián-Rochina, I., & Cauli, O. (2021). Chemotherapy-Induced Neuropathy and Diabetes: A Scoping Review. *Current Oncology*, *28*(4), 3124–3138. https://doi.org/10.3390/curroncol28040273

Siregar, M. A. A., & Fadinie, W. (2025). Hubungan Derajat Nyeri pada Brief Pain Inventory dengan Stadium Kanker Payudara. *Jurnal Kesehatan Andalas*, *11*(1), 8–13. https://doi.org/10.25077/jka.v11i1.1889

Sung, H., Ferlay, J., Siegel, R. L., Laversanne, M., Soerjomataram, I., Jemal, A., & Bray, F. (2021). Global Cancer Statistics 2020: GLOBOCAN Estimates of Incidence and Mortality Worldwide for 36 Cancers in 185 Countries. *CA: A Cancer Journal for Clinicians*, *71*(3), 209–249. https://doi.org/10.3322/caac.21660

Susanti, N., Noura, V., Fardani, S. N., Zuhra, F. E., & Siahaan, D. P. (2024). Hubungan Usia Menarche Dini Dengan Kejadian Kanker Payudara: Literatur Review. *PREPOTIF : JURNAL KESEHATAN MASYARAKAT*, *8*(2), 2693–2698. https://doi.org/10.31004/prepotif.v8i2.27909

V. Subramaniam, A., Salem Yehya, A. H., & Oon, C. E. (2019). Molecular Basis of Cancer Pain Management: An Updated Review. *Medicina*, *55*(9), 584. https://doi.org/10.3390/medicina55090584

Van Den Beuken-van Everdingen, M. H. J., Hochstenbach, L. M. J., Joosten, E. A. J., Tjan-Heijnen, V. C. G., & Janssen, D. J. A. (2016). Update on Prevalence of Pain in Patients With Cancer: Systematic Review and Meta-Analysis. *Journal of Pain and Symptom Management*, *51*(6), 1070-1090.e9. https://doi.org/10.1016/j.jpainsymman.2015.12.340

Wawolumaja, A., Pontoh, V., & Merung, M. (2019). Terapi pada Pasien Kanker Payudara Stadium Lanjut Menurunkan Kadar C- Reaktif Protein dan Meningkatkan Kadar Albumin. *JURNAL BIOMEDIK (JBM)*, *11*(2), 116. https://doi.org/10.35790/jbm.11.2.2019.23324

Widiana, I. K., & Irawan, H. (2020). Clinical and Subtypes of Breast Cancer in Indonesia. *Asian Pacific Journal of Cancer Care*, *5*(4), 281–285. https://doi.org/10.31557/apjcc.2020.5.4.281-285

Wiffen, P. J., Wee, B., Derry, S., Bell, R. F., & Moore, R. A. (2017). Opioids for cancer pain—An overview of Cochrane reviews. *Cochrane Database of Systematic Reviews*, *2020*(2). https://doi.org/10.1002/14651858.CD012592.pub2

Wong, A. K., Hawke, J., Eastman, P., Buizen, L., & Le, B. (2023). Does cancer type and adjuvant analgesic prescribing influence opioid dose?—A retrospective cross-sectional study. *Annals of Palliative Medicine*, *12*(4), 783–790. https://doi.org/10.21037/apm-22-1296

Wongkar, R., Angka, R. N., & Angeline, R. (2022). Karakteristik Pasien Kanker Stadium 4 yang Mendapatkan Perawatan Paliatif di Rumah Sakit X. *Jurnal Kedokteran Meditek*, *28*(2), 126–132. https://doi.org/10.36452/jkdoktmeditek.v28i2.2235

World Health Organization. (2018). *WHO guidelines for the pharmacological and radiotherapeutic management of cancer pain in adults and adolescents*. World Health Organization.

Yulianti, I., Setyawan S, H., & Sutiningsih, D. (2016). Faktor-faktor Resiko Kanker Payudara (Studi Kasus Pada Rumah Sakit Ken Saras Semarang). *Jurnal Kesehatan Masyarakat (e-Journal)*, *4*(4), 401–409.