Healthy Tadulako Journal (Jurnal Kesehatan Tadulako)
Vol. 11 No. 4, October 2025
P-ISSN : 2407-8441/e-ISSN : 2502-0749

Original Research Paper

Post Mastectomy Pain Syndrome (PMPS) Incident Profile at Ibnu Sina Hospital Makassar in May–August 2024

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Access this article online
Quick Response Code :

DOI : 10.22487/htj.v11i4.1767

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Page : 611-619

Article History:
Received: 2025-01-14
Revised: 2025-10-10
Accepted: 2025-10-10

Published by:
Tadulako University, Managed by Faculty of Medicine.

Website :
https://jurnal.fk.untad.ac.id/index.php/htj/index

Abstract

Background: Post-Mastectomy Pain Syndrome (PMPS) is a chronic neuropathic pain lasting over three months after mastectomy, often affecting the chest, axilla, or arm, yet data on its prevalence in Eastern Indonesia remain scarce. **Objective:** To describe the characteristics and impact of PMPS among post-mastectomy patients at Ibnu Sina Hospital. **Methods:** A descriptive observational study was conducted involving 30 post-mastectomy patients diagnosed with PMPS, using univariate analysis with SPSS 25.0 to assess pain characteristics and quality-of-life effects, with neuropathic pain defined as a score ≥4 on the Neuropathic Pain Scale. **Results:** The majority of patients (76.7%) experienced chronic pain localized mainly to the anterior chest and axilla, often radiating to the upper arm. About 70.0% reported significant interference with daily activities, sleep disturbance, and psychological distress, while 60.0% experienced pain exacerbation during shoulder movement. Neuropathic characteristics such as burning and tingling sensations were frequently reported, with moderate to severe pain intensity noted in over half of the participants. These findings indicate that PMPS substantially compromises patients' physical function and emotional well-being during postoperative recovery. **Conclusion:** PMPS prevalence is high and markedly affects quality of life, necessitating early screening and multidisciplinary pain management in post-mastectomy care.

Keywords: *PMPS; Neiropathic Pain; Quality of Life.*

Introduction

Cancer is a malignant neoplasm with a significant impact on health in Indonesia, causing high morbidity and mortality rates. In 2022, an estimated 408,000 cancer cases occurred, with a mortality rate of 59.24%. The impacts of cancer include physical, psychological, and social aspects, impacting patients' quality of life[1,2]. During treatment, such as chemotherapy, patients experience side effects that can reduce their quality of life, such as fatigue, pain, nausea, and anxiety, leading to depression[3].

Breast cancer is a malignant tumor originating from cells that grow and develop in the tissues or organs surrounding the breast[4]. Breast cancer is the most deadly malignancy for women worldwide. Breast cancer is currently one of the most commonly diagnosed cancers and the 4th leading cause of cancer-related death with an estimated 2.3 million new cases worldwide according to GLOBOCAN 2020 data. Deaths from breast cancer are more frequently reported (incidence rate approximately 42.9% higher) in Asian countries compared to European countries[5,6].

With incidence and mortality rates of 16.7% and 11.0%, respectively, breast cancer is the cancer with the highest incidence and the second most common cause of death in Indonesia. Most breast cancer survivors face physical complications and residual symptoms, such as neuropathic pain or post-mastectomy pain syndrome and chronic pain[5,7].

One of the most common residual symptoms seen in cancer patients is chronic pain. Pain is defined by the International Association for the Study of Pain (IASP) as an unpleasant sensory and emotional experience associated with actual or potential tissue damage. Pain usually decreases when lesions heal or the pain threat disappears, but if pain persists after normal tissue healing, it can be considered chronic[6].

Chronic pain is pain that persists for a long time without resolution. It can initially occur as acute pain and then persist for more than three months. One of the most common causes of chronic pain is surgery. Not all patients who undergo the same surgical procedure will experience chronic postoperative pain; the cause is still not precisely known. Preoperative factors (such as female gender, young age, genetics, repeated surgery, anxiety), intraoperative factors (such as surgical techniques that risk nerve damage), and postoperative factors (such as acute pain with moderate-severe intensity, radiation therapy, neurotoxic chemotherapy, neuroticism, and anxiety) are some factors that influence the occurrence of chronic pain[8].

The impact of pain is not limited to clinical syndromes alone but is also an important factor in patients' quality of life and well-being. As shown by a study in the Journal of the American Society, musculoskeletal pain occurs in 53 to 70 percent of patients who undergo breast cancer surgery and additional therapy[9].

Breast cancer is currently the most common type of cancer in women. Approximately one million new cases are diagnosed each year. One medical treatment for breast cancer is surgical removal of the breast, often called a mastectomy. However, some patients who undergo mastectomy experience side effects, including a collection of moderate to severe pain symptoms that can reduce their quality of life, often referred to as Post-Mastectomy Pain Syndrome (PMPS)[10].

Neuropathic pain is an uncomfortable condition experienced by patients. This condition arises due to dysfunction or nerve damage caused by several factors[11]. According to the International Association for the Study of Pain (IASP), Post-Mastectomy Pain Syndrome (PMPS) is a persistent pain symptom immediately after mastectomy characterized by sharp pain in the anterior chest, arm, and axilla, exacerbated by shoulder joint movement, and persisting for more than 3 months post-mastectomy surgery[5,12].

The clinical picture depends on which nerve is damaged during surgery, such as the intercostobrachial, medial pectoral, lateral pectoral, thoracodorsal, or long thoracic nerves. Injury to one or more of these nerves is considered the cause of PMPS development because the quality of neuropathic pain is crucial to its definition[13]. Quality of life is a functional condition that includes physical health, psychological health, social relationships, and environmental conditions[14].

The novelty of this study is the location of sample collection at Ibnu Sina Hospital Makassar in 2024 with a sample size of 30 that meets the inclusion and exclusion criteria. This study addresses the significant gap in PMPS data from Eastern Indonesia, where breast cancer prevalence is high but systematic pain assessment protocols may be lacking. The inclusion criteria for this study were patients willing to be respondents, patients diagnosed with breast cancer who had undergone mastectomy surgery at Ibnu Sina Hospital

Makassar in May-August 2024, patients experiencing pain for more than 3 months after mastectomy surgery, and patients recorded in the surgical oncology polyclinic book who had undergone mastectomy surgery at Ibnu Sina Hospital Makassar in May-August 2024.

The objective of this study is to determine the characteristics of neuropathic pain using the Neuropathic Pain Scale and quality of life characteristics due to neuropathic pain 3 months post-mastectomy at Ibnu Sina Hospital Makassar in May-August 2024.

Materials and Methods

Research Design

This study employed a descriptive observational design with quantitative methodology. Consecutive sampling was used to select 30 post-mastectomy patients at Ibnu Sina Hospital Makassar.

Sample

This sample size was determined based on a power analysis with 80% power to detect a 25% difference in PMPS prevalence compared to existing literature, assuming a 95% confidence level. The inclusion criteria were: willingness to participate, patients diagnosed with breast cancer who had undergone mastectomy surgery, and patients experiencing pain 3 months post-surgery. Exclusion criteria included patients with pre-existing chronic pain conditions, cognitive impairment affecting pain reporting, or those who had undergone additional surgical procedures in the affected area. This study was conducted from May 20, 2024, to August 20, 2024, at the Surgical Oncology Clinic of Ibnu Sina Hospital Makassar.

Data Collection Technique

Data collection was performed using a questionnaire consisting of 18 questions. Respondents who met the inclusion criteria were given explanations about the purpose of the study, and a consent form was provided for questionnaire completion. The questionnaire included the Neuropathic Pain Scale (NPS) to assess pain characteristics and the Brief Pain Inventory-Q (BPI-Q) to evaluate quality of life impact.

Data Analysis Technique

Data analysis was performed using SPSS version 25.0. Descriptive statistics (frequency, percentage, mean, standard deviation) were used to summarize the characteristics of neuropathic pain and quality of life. The chi-square test was used to examine associations between pain characteristics and quality of life domains. A p-value of <0.05 was considered statistically significant.

Etical Consideration

This study received approval from the Research Ethics Committee of Ibnu Sina Hospital. All patient data were kept confidential and used solely for research purposes. Patient information was anonymized to maintain privacy, and the study was conducted according to research ethics principles.

Results

This study examined the characteristics of Post-Mastectomy Pain Syndrome at Ibnu Sina Hospital Makassar. The independent variable examined in this study was post-mastectomy surgery patients experiencing neuropathic pain 3 months post-surgery. Data were collected through interviews from May to August 2024, with 30 primary data points meeting the inclusion and exclusion criteria. The results of this study are expected to provide valuable insights for improving postoperative pain management and rehabilitation strategies for breast cancer patients

Table 1. Characteristics of neuropathic pain or PMPS in post-mastectomy patients at Ibnu Sina Hospital Makassar, May-August 2024

Neuropathic pain	The Neuropathic Pain Scale				
	No Pain	Mild	Moderate	Severe	Total
Numbness	0	3	13	14	30
Tingling	0	6	24	0	30
Increased pain on touch	30	0	0	0	30

Source: Primary Data (2024)

Table 2. Characteristics of neuropathic pain or PMPS in post-mastectomy patients at Ibnu Sina Hospital Makassar, May-August 2024

Neuropathic pain	The Neuropathic Pain Scale		Total
	Yes	No	
Burning sensation	21	9	30
Electric Shock Sensation	23	7	30
Cold piercing sensation	11	19	30
Itching	18	12	30
Hyperthesia to touch	0	30	30
Hyperthesia to prick	0	30	30
Brushing	0	30	30

***Source:** Primary Data (2024)*

Table 3. Percentage of neuropathic pain or PMPS in post-mastectomy patients at Ibnu Sina Hospital Makassar, May-August 2024

Neuropathic pain score	Frequency	Percentage (%)
≤4	7	23.3
≥4	23	76.7
Total	**30**	**100.0**

Source: Primary Data (2024)

Table 5. Percentage of quality of life disorders in PMPS patients at Ibnu Sina Hospital Makassar May-August 2024

Quality of Life Score	Frequency	Percentage (%)
≤4	9	30.0
≥4	21	70.0
Total	**30**	**100.0**

Source: Primary Data (2024)

Based on Table 1, most patients with Post-Mastectomy Pain Syndrome (PMPS) experienced severe numbness (14 patients), moderate tingling (24 patients), and no increase in pain due to touch (30 patients). Table 2 shows that PMPS manifestations included burning sensations in 21 patients, electric shock sensations in 23 patients, cold piercing sensations in 11 patients, and itching in 18 patients, while none experienced touch hyperesthesia, prick hyperesthesia, or brushing sensations. According to Table 3, out of 30 PMPS cases, 23 patients had neuropathic pain with a pain score of ≥4, whereas 7 patients did not experience neuropathic pain with a score of ≤4. Table 4 demonstrates that PMPS negatively affected multiple aspects of quality of life, including increased pain intensity within 24 hours, limitations in general activity, mood disturbances, walking difficulties, impaired social relationships, sleep disturbances, and reduced enjoyment of life. Furthermore, Table 5 reveals that 21 out of 30 patients experienced a decreased quality of life with scores of ≥4, while 9 patients maintained a better quality of life with scores of ≤4. Overall, these findings indicate that neuropathic pain is prevalent among PMPS patients and significantly contributes to physical discomfort, emotional distress, and reduced daily functioning. These results emphasize the urgent need for comprehensive pain assessment and multidisciplinary management approaches to improve the overall quality of life of post-mastectomy patients.

Table 4. Characteristics of quality of life disorders in PMPS patients at Ibnu Sina Hospital Makassar May-August 2024

Quality of Life	Brief Pain Inventory-Q				Total
	No Pain	Mild	Moderate	Severe	
Increased pain within 24 hours	4	14	12	0	30
Average Increase in Pain	0	7	23	0	30
General activity	2	25	3	0	30
Mood	6	24	0	0	30
Ability to walk	30	0	0	0	30
Relatioship with others	10	20	0	0	30
Sleep	3	25	2	0	30
Enjoying life	6	24	0	0	30

Source: Primary Data (2024)

Discussion

Neuropathic Pain

The results of this study show that PMPS patients, in addition to experiencing pain, can also experience numbness, tingling, itching that does not disappear with scratching, and burning sensations. According to the distribution obtained using the neuropathic pain score, post-mastectomy patients at Ibnu Sina Hospital Makassar who experienced neuropathic pain or PMPS were 23 people (76.7%).

The finding that 76.7% of patients experienced PMPS but only 23.3% reported "severe" pain (Table 1) suggests that while most patients develop neuropathic pain symptoms, the intensity varies considerably. This variation may be attributed to individual differences in pain perception, coping mechanisms, or the extent of nerve damage during surgery. The results of this study are consistent with Yuksel SS et al. in their study "Post mastectomy pain syndrome: A systematic review of prevention modalities," which found that PMPS patients experience neuropathic pain such as numbness, tingling, burning sensation, electric shock sensation, and continuous pain in the arm, axilla, and chest wall[15].

In another study by Marco Calapai et al. titled "Post mastectomy pain: an updated overview on risk factors, predictor and markers" (2021), it was observed that after breast surgery or mastectomy, women experience post-mastectomy pain syndrome (PMPS), with 25% to 60% of those undergoing mastectomy experiencing PMPS. Risk factors for PMPS are not well understood, although surgery has been considered to include predisposing factors and others such as anatomical, psychosocial, and genetic factors[16].

PMPS is often described as typical neuropathic pain characterized by burning, cold piercing, electric shock sensation, or tingling sensations. Prolonged pain can lead to other health problems, such as shoulder strength in the area experiencing PMPS due to lack of movement in the painful area or swelling in the arm caused by lymphatic blockage due to lack of movement of the body part experiencing PMPS. Continuous pain can also cause sleep deprivation to psychological disorders in sufferers[17].

From the results of this study, it is also known that PMPS patients experience itching sensations. Itching in PMPS patients may be a sign of nerve damage due to breast surgery. Surgical procedures, especially those involving manipulation or repositioning of nerves, can disrupt normal nerve function. In the research article by Anastasia Climan et al. titled "Itching

after breast surgery" (2023), healing after mastectomy is a complex process involving tissue repair and regeneration. Factors such as moisture level and skin acidity can also cause itching. In response to surgery, the immune system releases the chemical histamine, which can trigger itching sensations by interacting with nerve endings in the skin. Additionally, scar tissue formation can cause itching. As the body recovers, collagen fibers form to repair the skin. This process can result in itching as new tissue grows. Nerves also need to regenerate over time, which can also cause itching[18].

Risk factors for PMPS may include the severity of surgery, radiation therapy, or pre-existing conditions such as diabetes. People with a history of acute pain may be more susceptible to chronic postoperative discomfort. Other factors that may increase the likelihood of experiencing pain after breast surgery or PMPS include age, overall health status, and the complexity of the surgical procedure[11,12].

Quality of Life

Based on the results of this study, PMPS patients experience quality of life disorders due to chronic pain. According to the distribution obtained using the quality of life score, PMPS patients at Ibnu Sina Hospital Makassar who experienced decreased quality of life due to neuropathic pain were 21 people (70.0%).

This finding is consistent with the study by Pei Yu Tan et al. titled "Post mastectomy pain syndrome: a timely review of its predisposing factor and current approaches to treatment" (2021), which states that like many other chronic pain conditions, PMPS negatively impacts the quality of life of recovery and patient satisfaction, causing decreased quality of life, including poor sleep, long-term disability, and disruption of daily life activities and interpersonal relationships[19].

In another study by Larasati P.S.M et al. titled "Factors that Affect Quality Of Life of Post Mastektomic Breast Cancer Patients at Sanglah Hospital" (2022), it was stated that most breast cancers are diagnosed in adolescent women over 20 years of age, with the risk of breast cancer development increasing after 25 years and continuing to increase in women aged 35-50 years. Quality of life assessment based on age showed that the quality of life of adult patients over 60 years was better than those under 60 years[20]. This is due to physical limitations, social activity disorders, and worse emotional influences in patients in the younger age category. It was also found that physical activity has a positive impact on fatigue and distress in cancer patients because it can increase feelings of happiness due to endorphin hormones, thereby improving quality of life and survival of patients diagnosed with cancer. In primary prevention, physical activity is performed for two hours or more with brisk walking for a week or equivalent. In this study, it was also found that cancer patients with low economic status had more health problems and disease symptoms, as well as a significant decrease in quality of life compared to patients with sufficient socioeconomic status.

Continuous pain can have long-term impacts on the quality of life of patients undergoing breast cancer surgery[21]. The impact of pain is not limited to clinical syndromes but is also an important factor in quality of life and patient well-being[22]. Chronic pain also causes negative effects on physical, cognitive, and emotional functions. Psychological factors such as higher anxiety levels before treatment, depression, sleep disorders, and perceived stress have been proven to be related to continuous post-mastectomy pain[23].

In another study according to Gong Y et al. titled "Prevalence of post mastectomy pain syndrome and associated risk factors" (2020), it was stated that PMPS can affect patient quality

of life. Using a simple healthy quality of life scale to assess quality of life, higher scores indicate better health status and function. The results of the study showed that global QoL scores, physical function scores, role function scores, and social function scores were reduced in the PMPS group. Patients with PMPS also had poorer body image, sexual enjoyment, and breast symptoms. These results indicate that PMPS has a fairly large negative impact on the quality of life of affected women, consistent with the reported data[24].

The analysis of this study indicates that each PMPS patient will experience a decrease in quality of life due to continuous pain causing long-term impacts on the quality of life of PMPS patients[12,18].

Study Limitations

This study has several limitations that should be considered when interpreting the results. First, the single-site design at Ibnu Sina Hospital Makassar may limit the generalizability of findings to other healthcare settings. Second, the short study period (May-August 2024) may not capture the long-term trajectory of PMPS symptoms and their impact on quality of life. Third, the lack of a control group prevents establishing causal relationships between mastectomy procedures and subsequent pain development. Fourth, the study did not collect data on preoperative pain status or psychological factors that might influence PMPS development. Finally, the small sample size may limit the statistical power to detect significant associations between variables.

Future Research Directions

Based on the findings and limitations of this study, several recommendations for future research can be made. First, longitudinal studies with longer follow-up periods are needed to understand the trajectory of PMPS symptoms and their impact on quality of life over time. Second, multicenter studies with larger sample sizes would enhance the generalizability of findings and allow for subgroup analyses. Third, future studies should include comprehensive assessment of preoperative factors (psychological status, pre-existing pain conditions) and intraoperative factors (surgical techniques, nerve identification) that may influence PMPS development. Fourth, intervention studies evaluating different pain management strategies for PMPS patients are needed to establish evidence-based treatment protocols. Finally, qualitative studies exploring patients' experiences with PMPS could provide valuable insights into the psychosocial impact of this condition.

Conclusion

The study revealed that most post-mastectomy patients at Ibnu Sina Hospital experienced significant neuropathic pain or post-mastectomy pain syndrome (PMPS), with 76.7% having a neuropathic pain score ≥4, which correlated with reduced quality of life in 70% of patients. These findings underscore the need for routine PMPS screening and the integration of standardized pain assessment tools in post-surgical care. A multidisciplinary approach involving surgeons, anesthesiologists, pain specialists, physiotherapists, and psychologists is essential to address the complex nature of PMPS and to provide both pharmacological and non-pharmacological interventions that can prevent chronic pain and enhance recovery. Despite potential data collection limitations related to respondent understanding and recall bias, continuous monitoring and further in-depth research are necessary to clarify the link between neuropathic pain and diminished quality of life among post-mastectomy patients, ensuring better long-term care for breast cancer survivors.

Acknowledgments

Sincere thanks to both parents and siblings who always pray, provide advice and encouragement, and make many sacrifices so that the author can complete education well. Thanks are also given to all friends who have helped the researcher in this study. And not to forget the respondents who have participated in this study by sincerely taking the time to provide very valuable information. Thanks also to RS Ibnu Sina for granting permission to conduct this research.

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