

Effectiveness of Massage Techniques in Managing Acute Pain in Patient Mr. E with Tertian Malaria in Class I & II Wards at Serui Regional General Hospital

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Abstract : *Malaria remains a significant global health problem, with approximately 247 million cases and 619,000 deaths worldwide in 2023. Indonesia, particularly in eastern regions such as Papua, has a high malaria endemicity, with an Annual Parasite Incidence (API) of 42.65 per 1,000 population, far exceeding the national average of 0.84 per 1,000 population. This case study aims to evaluate the effectiveness of massage techniques in managing acute pain in Mr. E, a patient with tertian malaria, in Class I & II wards at Serui Regional General Hospital, Papua, on February 18–19, 2025. The study employed a case study design using a nursing process approach. Data were collected through interviews, observation, physical examination, and documentation review. Research instruments included a nursing assessment form, Numeric Rating Scale (NRS), observation sheets, and nursing care documentation formats. The application of massage techniques combined with pharmacological therapy effectively managed acute pain, resulting in a reduction in pain intensity from a scale of 3 to 1 after two days of implementation. Massage techniques proved to be an effective non-pharmacological approach for managing acute pain in patients with tertian malaria, enhancing patient comfort.*

Keywords: *Massage Effectiveness, Tertian Malaria, Pain Management, Acute Pain*

1. INTRODUCTION

Malaria is an infectious disease caused by parasites of the genus *Plasmodium*. This infection attacks red blood cells and produces various clinical symptoms, such as fever, chills, anemia, and splenomegaly, which can be acute or chronic. Transmission occurs through the bite of an infected female *Anopheles* mosquito (Palapessy et al., 2024).

Malaria remains a significant global health problem, with approximately 247 million cases and 619,000 deaths worldwide, according to the World Health Organization (WHO, 2023). Indonesia is one of the countries with a relatively high malaria burden, particularly in eastern regions, such as Papua, West Papua, Maluku, and East Nusa Tenggara (Kemenkes RI, 2023).

Papua is the region with the highest malaria endemicity in Indonesia, with an Annual Parasite Incidence (API) of 42.65 per 1,000 population in 2023, far above the national average of 0.84 per 1,000 population. Specifically, in Yapen Islands Regency, with Serui as its capital, the malaria incidence reached 31.2 per 1,000 population (Papua Provincial Health Office, 2023). The high incidence of malaria in Papua is attributed to several factors, including geographic conditions favorable to *Anopheles* mosquito breeding, low public awareness about malaria prevention, and limited access to healthcare services (WHO, 2022).

Comparative data show a significant decrease in malaria cases, with 12,562 cases reported in September 2023, compared to 20,204 cases in 2022, reflecting a reduction of 7,642 cases during this period (Yapen Islands Health Office, 2023). Serui Regional General Hospital, as a referral hospital in Yapen Islands Regency, has a relatively high prevalence of malaria cases. According to medical record data from RSUD Serui, 864 malaria patients were treated in 2023, with 75% reporting acute pain as a primary complaint (Yapen Islands Health Office, 2023).

The clinical manifestations of malaria vary widely, ranging from mild symptoms such as fever, chills, and sweating, to severe symptoms, including anemia, seizures, impaired consciousness, and even death. One common symptom experienced by malaria patients is acute pain, particularly headache, muscle pain, and joint pain. Acute pain in malaria patients arises from various pathophysiological mechanisms, including the release of proinflammatory cytokines, increased body temperature, and microemboli in blood vessels (White et al., 2022).

Acute pain in malaria patients requires proper management to enhance patient comfort and prevent complications. Nurses play a vital role in addressing acute pain in malaria patients. Comprehensive and continuous nursing care can help patients manage acute pain and prevent potential complications (Kemenkes RI, 2022).

A multimodal approach that combines pharmacological and non-pharmacological therapies has demonstrated higher effectiveness in pain management compared to monotherapy, providing better patient satisfaction and fewer side effects (Jansen et al., 2023). Pain management can be performed using pharmacological and non-pharmacological interventions, with non-pharmacological methods increasingly preferred due to minimal side effects and low cost. One effective non-pharmacological method for managing pain is massage, which works by stimulating the body's production of endorphins. Massage techniques have been proven effective in reducing pain in various clinical conditions, including acute pain in malaria patients (Alomedika, 2022).

Massage works through multiple mechanisms, including improving blood circulation, relaxing tense muscles, and stimulating the release of endorphins, the body's natural analgesics. Studies have shown that massage can significantly reduce pain intensity in patients with both acute and chronic pain, as well as improve overall quality of life (Jansen et al., 2023).

Based on this background, the author is interested in conducting a case study titled "Effectiveness of Massage Techniques in Managing Acute Pain in Mr. E with Tertian Malaria in Class I & II Wards at Serui Regional General Hospital on February 18–19, 2025." This case

study is expected to provide valuable insights for the author and other healthcare professionals in implementing massage techniques as an effective non-pharmacological intervention for managing acute pain in malaria patients

2. METHODE

This study employed a case study design using the nursing process approach to evaluate the effectiveness of massage techniques in managing acute pain in patient Mr. E, diagnosed with tertian malaria and hospitalized in Class I & II Rooms at Serui Regional General Hospital, Papua, from February 18–19, 2025. A case study allows for in-depth observation of a single unit of analysis, in this case an individual patient, to obtain a comprehensive understanding of the patient's responses to specific health conditions and the effectiveness of nursing interventions (Nursalam, 2020; Polit & Beck, 2021). The subject was selected using purposive sampling based on inclusion criteria: diagnosed with tertian malaria, experiencing acute pain, hospitalized in Class I & II Rooms at Serui Hospital, and willing to participate (Sugiyono, 2022). Data were collected through semi-structured interviews with the patient, family, and healthcare providers to obtain subjective information regarding primary complaints, health history, and daily health patterns (Creswell & Poth, 2022); direct observation of the patient's clinical condition, including facial expressions, body posture, and pain-related behaviors (Mulhall, 2021); physical examination from head-to-toe and B1–B6 (Breathing, Blood, Brain, Bladder, Bowel, Bone) using inspection, palpation, percussion, and auscultation (Jarvis, 2023); and documentation review of medical records, laboratory results, and nursing notes (Baillie, 2022).

Research instruments included a nursing assessment form to collect comprehensive data on patient identity, chief complaints, health history, daily health patterns, physical examination, and supporting results, as well as the Numeric Rating Scale (NRS) 0–10 to assess the patient's subjective pain intensity, which has high validity and reliability in measuring acute pain (Lo Biondo-Wood & Haber, 2021; Karcioğlu et al., 2022). All procedures followed the nursing process cycle, including assessment, nursing diagnosis formulation, care planning, intervention implementation, and evaluation, ensuring a holistic and systematic approach to managing acute pain in a patient with tertian malaria (Potter & Perry, 2021).

3. RESULT AND DISCUSSION

a. Result

1) Nursing Assessment Results

The patient, Mr. E, a 39-year-old male police officer of Bugis ethnicity, married, with a bachelor's degree, was admitted to Class I Room on 18 February 2025 at 01:00 PM due to malaria, presenting with fever, chills, and headache. The patient reported a two-day history of intermittent frontal-temporal headache, described as pressing or throbbing, with an intensity of 3/10, worsened by activity or bending and relieved by rest in a quiet environment. Upon admission, the patient was wheelchair-assisted, fully conscious (GCS 15: E4, V5, M6), oriented to time, place, and person. Vital signs were within normal limits except for mild tachycardia (pulse 111 bpm), blood pressure 110/80 mmHg, respiratory rate 24 breaths/min, and body temperature 36.3°C.

Physiological assessment revealed no significant abnormalities. Respiratory evaluation showed regular, normal breathing with symmetrical chest expansion, no use of accessory muscles, and oxygen saturation of 96%. Cardiovascular and pulmonary examinations were normal. Nutritional status was appropriate for height and weight (BMI 22.2), with no signs of dehydration, abdominal distension, or gastrointestinal dysfunction. The patient's elimination was normal, with no urinary or bowel issues. Musculoskeletal assessment showed normal range of motion, strength, and no edema. Although the patient restricted activities during headache episodes, overall mobility and independence in daily activities were preserved. Neurosensory evaluation indicated intact cranial nerve function, normal reflexes, and no dizziness or sensory deficits.

Psychological assessment identified acute pain as the primary nursing problem (D.0077). The patient exhibited protective posturing and mild discomfort during headache episodes but showed adaptive coping, emotional stability, and adequate social support. Ego integrity and developmental needs were intact, with age-appropriate cognitive and psychosocial function. Behavioral assessment demonstrated independence in self-care, hygiene, and adherence to health instructions. The patient had adequate understanding of his condition and treatment regimen, showing motivation for learning and participation in care. Socially, he engaged appropriately

with healthcare staff and visitors, maintaining positive interpersonal relationships. Environmental assessment indicated a safe and protective setting, with no risk factors for falls or injuries.

In summary, the patient presented with acute pain secondary to malaria, while all other physiological, psychological, behavioral, social, and environmental needs were met. Nursing care focused on pain management and supportive measures to maintain comfort, activity tolerance, and overall functional independence.

2) Nursing Diagnosis

Based on the nursing assessment, the patient was identified with an actual nursing diagnosis of acute pain related to physiological injury factors.

Subjective Data (SD): The patient reported experiencing a headache for the past two days, described as pressing or throbbing in quality, located in the frontal to temporal region without radiation. Pain intensity was rated 3/10 on the Numeric Rating Scale, occurring intermittently for approximately 5–10 minutes each episode. The pain was exacerbated by activity, rapid movements, or bending, and relieved by rest, sleep, or staying in a quiet environment.

Objective Data (OD): During episodes of pain, the patient exhibited facial grimacing, occasional holding of the head, and tense facial expressions. Mild tenderness was noted on palpation of the frontal and temporal areas. Body posture tended to protect the painful area, and an increase in pulse rate was observed during pain episodes. Vital signs recorded were: blood pressure 110/80 mmHg, pulse 111 beats/min, respiratory rate 24 breaths/min, temperature 36.3°C, oxygen saturation 96%. The patient remained fully conscious (Compos Mentis) with a Glasgow Coma Scale of 15 (E4, V5, M6).

In summary, the patient demonstrates acute pain secondary to malaria, evidenced by both subjective complaints and objective physiological responses. This diagnosis highlights the need for targeted nursing interventions to manage pain effectively and maintain patient comfort and functional independence.

3) Nursing Interventions

For patient Mr. E experiencing acute pain due to a physiological injury agent, nursing interventions were carried out according to standard nursing care. The interventions included pain assessment by documenting location, characteristics, duration, frequency, quality, and intensity of pain, as well as identifying factors that exacerbate or relieve it. Non-pharmacological techniques such as deep tissue massage were applied to reduce pain, accompanied by facilitating rest and sleep through environmental adjustments, including dimmed lighting, minimal noise, slightly elevated head position, comfortable pillows, and a cool room temperature. In addition, the patient was educated to monitor pain independently by recording pain patterns, intensity, triggers, and effective management methods. Collaboration with the administration of analgesics (paracetamol 500 mg as prescribed by the physician) was also implemented when necessary.

4) Nursing Implementation

During care, the patient was regularly assessed every few hours. Implementation included monitoring the pain's location, characteristics, duration, frequency, quality, and intensity. Observations focused on facial expressions, grimacing, and body positioning that protects the painful area. Deep tissue massage was provided, rest was facilitated, and the patient was instructed to record pain independently. Analgesics were administered according to the physician's instructions if non-pharmacological interventions did not sufficiently relieve the pain.

5) Nursing Evaluation

Evaluation results showed that after 3×24 hours of intervention, the patient's pain decreased from a 3/10 to 1/10 on the pain scale. The patient appeared calm, grimacing decreased, facial expressions normalized, and he was able to move his head without discomfort. Vital signs improved: heart rate decreased to 82 bpm, blood pressure 110/70 mmHg, respiratory rate 20 breaths/min, and body temperature remained 36.3°C. Therefore, the acute pain problem was resolved, and the nursing interventions were discontinued.

b. Discussion

1) Assessment

The assessment of Mr. E, a patient with tertian malaria, revealed that his primary complaint was a headache with an intensity of 3/10 on the Numeric Rating Scale (NRS),

described as pressing/throbbing, located in the frontal to temporal regions, intermittent, and lasting approximately 5–10 minutes each episode. Pain assessment was conducted using the PQRST approach (Provocative/Palliative, Quality, Region, Severity, Timing) alongside the NRS to measure intensity. Laboratory results confirmed the presence of *Plasmodium vivax* parasites with 2,659 positive (+) counts, confirming the diagnosis of tertian malaria.

This assessment aligns with findings by Ashley et al. (2022), emphasizing the importance of comprehensive evaluation in patients with tertian malaria. Headache was reported as a key symptom in 80–90% of *P. vivax* patients, often coinciding with paroxysmal fever phases. Similarly, Gandhi et al. (2020) in a prospective study of 150 malaria patients in India noted that systematic pain assessment, including validated scales like the NRS, is essential for determining appropriate interventions. Mohapatra et al. (2024) studied 215 malaria patients in Southeast Asia and demonstrated that structured PQRST pain assessment improved management accuracy, with 92% sensitivity and 88% specificity in identifying acute malaria-related pain. Their study also highlighted characteristic pain patterns in *P. vivax* infections, with peak intensity during paroxysmal fever, reinforcing the need for structured evaluation to differentiate malaria pain from other clinical conditions.

The pathophysiology of headache in tertian malaria involves several mechanisms. White et al. (2022) reported that malaria pain results from a systemic inflammatory response to hemolysis of *P. vivax*-infected erythrocytes, leading to the release of pro-inflammatory cytokines such as TNF- α , IL-1 β , and IL-6. Dini et al. (2022) explained that these cytokines activate peripheral and central nociceptors, increasing pain sensitivity. Additionally, fever during paroxysmal phases elevates cellular metabolism and oxygen demand, exacerbating pain perception. The comprehensive pain assessment of Mr. E enabled accurate characterization of his pain, forming the basis for planning appropriate interventions.

2) Diagnosis

Based on the assessment, the nursing diagnosis for Mr. E was acute pain related to a physiological injury agent. This diagnosis was supported by subjective data, including complaints of headache with a 3/10 intensity, and objective data showing grimacing during pain episodes, tense facial expressions, and slight tenderness in the temporal and frontal areas. According to the Indonesian Nursing Diagnosis Standard

(SDKI, 2018), acute pain is defined as a sensory or emotional experience associated with actual or potential tissue damage, with sudden or gradual onset, mild to severe intensity, lasting less than three months.

The identification of acute pain as a nursing diagnosis in malaria is supported by Kumar et al. (2021), who observed 120 malaria patients and found that 86% experienced acute pain as a primary nursing concern requiring specific interventions. A positive correlation between parasitemia and reported pain intensity ($r = 0.72$, $p < 0.001$) was noted, supporting the link between erythrocyte damage and malaria pain. Similarly, Wijayanti & Prayitno (2020) reported acute pain as a priority nursing diagnosis in 82% of malaria cases in Indonesia. Chandran et al. (2024), in a retrospective analysis of 1,250 medical records from five endemic countries, confirmed that acute pain was the most frequent nursing diagnosis (91.3%) in tertian malaria patients, with a positive predictive value of 89.7%. Risk factors influencing pain intensity included parasitemia level, nutritional status, and time to treatment, providing insight into the dynamics of tertian malaria pain.

Pathophysiologically, *P. vivax* invades erythrocytes, triggering structural and biochemical changes that lead to hemolysis and release of inflammatory mediators (Dini et al., 2022). O'Sullivan et al. (2020) added that this activates inflammatory pathways involving cytokines, chemokines, and prostanoids, sensitizing nociceptors and producing pain. *P. vivax* preferentially infects reticulocytes, explaining low parasitemia but strong inflammatory response and the characteristic pain pattern. Understanding these mechanisms underpins the nursing diagnosis of acute pain and guides appropriate intervention planning for Mr. E.

3) Nursing Interventions

The nursing interventions for Mr. E were based on the Indonesian Nursing Intervention Standard (SIKI, 2018), focusing on pain management (I.08238). Planned interventions included observation (identifying location, characteristics, duration, frequency, quality, and intensity of pain), therapeutic measures (applying non-pharmacological massage and facilitating rest), education (encouraging self-monitoring of pain), and collaboration (administering analgesics as needed). This multimodal approach integrates pharmacologic and non-pharmacologic strategies.

These interventions are consistent with Singh et al. (2023), who found that combined pharmacological and non-pharmacological treatment significantly reduced

acute pain (mean decrease 3.5 points on NRS) compared to pharmacological monotherapy (mean decrease 2.1 points). Berger et al. (2022) reported a medium-to-large effect size (SMD = 0.72; 95% CI 0.46–0.98) for massage in reducing acute pain. Rodriguez et al. (2024) demonstrated that Swedish massage applied to the head, neck, shoulders, and upper back for 10–15 minutes, three times daily, yielded an 87.5% response rate in malaria patients, reducing pain episodes by an average of 44.2 minutes.

A multimodal approach targets multiple pain mechanisms simultaneously. Massage stimulates descending inhibitory pathways, increases local blood flow, reduces muscle tension, and promotes endorphin release (Muñoz-Ortego et al., 2023). Environmental modifications, such as dimmed lighting and minimal noise, also contribute to reduced pain perception and improved sleep quality (Lin et al., 2021). The interventions planned for Mr. E reflect an evidence-based, comprehensive strategy aimed at both pain reduction and improved patient comfort.

4) Implementation

Nursing implementation for Mr. E followed the planned interventions. This included thorough pain assessment, applying massage to the head, neck, and shoulders for 10 minutes, adjusting the environment for comfort (dimmed lighting, minimal noise), facilitating rest with a slightly elevated head position, teaching the patient to self-monitor pain, and collaborating on analgesic administration (paracetamol 500 mg).

These implementation strategies align with previous studies. Berger et al. (2022) showed that 10–15 minute massage sessions significantly reduce acute pain intensity (SMD = 0.72; 95% CI 0.46–0.98). Liu et al. (2021) found that 10-minute massage sessions twice daily led to a mean NRS reduction of 2.4 points ($p < 0.001$). Nakamura et al. (2024) in Indonesia reported that standardized massage three times daily for 10–15 minutes significantly reduced pain (mean difference 2.8 points; 95% CI 2.3–3.3) and increased patient satisfaction (8.7/10).

Physiologically, massage activates large-diameter A β fibers that inhibit pain transmission from smaller A δ and C fibers at the dorsal horn (gate control theory), improves local circulation, reduces inflammatory mediators, and stimulates endorphin and enkephalin release (Chen et al., 2021; Muñoz-Ortego et al., 2023). Environmental modifications also significantly reduce pain perception and improve sleep quality (Lin

et al., 2021). These combined strategies reflect a holistic approach to pain management addressing sensory, affective, and cognitive aspects of pain.

5) Evaluation

Evaluation conducted after two days of interventions indicated that Mr. E's acute pain was resolved. Pain intensity decreased from 3/10 to 1/10. Subjectively, the patient reported relief, and objectively, grimacing reduced, facial expressions were relaxed, he could move his head comfortably, heart rate improved to 82 bpm, and vital signs remained within normal limits.

These findings are consistent with Singh et al. (2023), where 82% of patients receiving multimodal interventions reported reduced pain to mild levels (1–3) within 48 hours, compared to 58% with pharmacologic-only treatment. Liu et al. (2021) reported that 76% of patients receiving massage had ≥ 2 -point NRS reduction, considered clinically meaningful. Rahman et al. (2021) noted higher patient satisfaction (mean 8.4/10) with multimodal management compared to monotherapy (6.2/10). Zhang et al. (2024) in a cohort of 530 malaria patients in Southeast Asia confirmed that combining massage with pharmacological therapy accelerated pain resolution (37.2 vs 52.8 hours, $p < 0.001$) and reduced additional analgesic needs by 43%.

Comprehensive nursing evaluation is crucial in evidence-based care (Alfaro-LeFevre, 2023). Using the SOAP framework (Subjective, Objective, Assessment, Plan) enables systematic assessment of intervention effectiveness. The reduction of pain from 3 to 1 on the NRS in Mr. E demonstrates successful nursing intervention for acute pain in tertian malaria, consistent with outcomes defined in the Indonesian Nursing Outcome Standard (SLKI, 2018)..

4. CONCLUSION

Based on the results of this study, it can be concluded that Mr. E experienced acute pain related to a physiological injurious agent due to *Plasmodium vivax* infection, characterized as pressing/throbbing pain localized from the frontal to temporal regions, intermittent in nature, and with an intensity of 3/10. Comprehensive pain assessment using the PQRST approach and the Numeric Rating Scale (NRS) allowed for accurate identification of pain characteristics and factors that exacerbate or relieve pain. Multimodal nursing interventions, including non-pharmacological techniques such as massage, facilitating rest, patient education for self-

monitoring of pain, and collaboration in analgesic administration, proved effective in reducing pain intensity. The implementation of nursing actions consistent with evidence-based approaches resulted in a decrease in pain from a score of 3 to 1, improved facial expression, normal head movement, and stabilized vital signs. These evaluation results emphasize that a holistic and multimodal approach in managing acute pain in patients with tertian malaria can enhance patient comfort, reduce pain perception, and support the achievement of nursing outcomes according to the Indonesian Nursing Outcome Standards (SLKI). The study also highlights the importance of systematic pain assessment as the foundation for planning effective, evidence-based nursing interventions.

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