The effect of Copaiba aromatherapy on pain scale among postpartum Breast Cancer surgery patients at Prof. Dr. Margono Soekarjo Hospital, Purwokerto

O efeito da aromaterapia com Copaíba na escala de dor entre pacientes de cirurgia de Câncer de Mama pós-parto no Prof. Dr. Margono Soekarjo Hospital, Purwokerto

El efecto de la aromaterapia Copaiba en la escala de dolor entre las pacientes posparto de cirugía de Cáncer de Mama en el Hospital Prof. Dr. Margono Soekarjo, Purwokerto

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ABSTRACT
Background: The global incidence of breast cancer remains alarmingly high as of 2020. Following breast cancer surgery, patients often endure varying degrees of pain once the anesthesia wears off. Copaiba aromatherapy, a non-pharmacological approach, offers relief through natural compounds like beta-caryophyllene and alpha-humulene, effectively reducing pain levels. Aim: This study aimed to find out the effect of giving copaiba aromatherapy on the pain scale among postpartum breast cancer patients at Prof. Dr. Margono Soekarjo Purwokerto Regional Hospital. Method: This study employs a pre-
experimental research design, utilizing a one-group pre-test and post-test approach. Consecutive sampling was employed to select 41 respondents. The research instruments comprised pain scale checklist observation sheets and copaiba aromatherapy. Statistical analysis included bivariate analysis and paired t-tests. Results based on the findings, the majority of respondents fell within the age range of 50 to 60 years, possessed elementary school education, were housewives by occupation, and had undergone previous surgery. The pain scale was assessed both before and after administering copaiba aromatherapy to test its efficacy in pain management. Conclusion Copaiba aromatherapy has an effect on reducing the pain scale in mothers after breast cancer surgery.

**Keywords:** copaiba aromatherapy, post-op wound pain, Breast Câncer.

RESUMO

Contexto: A incidência global de câncer de mama continua alarmantemente alta em 2020. Após a cirurgia de câncer de mama, as pacientes geralmente sofrem vários graus de dor após o término da anestesia. A aromaterapia com copaíba, uma abordagem não farmacológica, oferece alívio por meio de compostos naturais como beta-caríofíleno e alfa-humuleno, reduzindo efetivamente os níveis de dor. Objetivo: Este estudo teve como objetivo descobrir o efeito da aplicação de aromaterapia com copaíba na escala de dor entre as pacientes com câncer de mama pós-parto no Hospital Prof. Método: Este estudo emprega um projeto de pesquisa pré-experimental, utilizando uma abordagem de pré-teste e pós-teste de um grupo. A amostragem consecutiva foi empregada para selecionar 41 entrevistados. Os instrumentos de pesquisa incluíram folhas de observação da lista de verificação da escala de dor e aromaterapia com copaíba. A análise estatística incluiu análise bivariada e testes t pareados. Com base nos resultados, a maioria dos entrevistados se enquadrava na faixa etária de 50 a 60 anos, possuía ensino fundamental, era dona de casa e havia se submetido a uma cirurgia anterior. A escala de dor foi avaliada antes e depois da administração da aromaterapia com copaíba para testar sua eficácia no controle da dor. Conclusão A aromaterapia com copaíba tem um efeito na redução da escala de dor em mães após a cirurgia de câncer de mama.

Palavras-chave: aromaterapia de copaíba, dor pós-operatória, Câncer de Mama.

RESUMEN

Antecedentes: La incidencia mundial del cáncer de mama sigue siendo alarmantemente alta en 2020. Tras una operación de cáncer de mama, las pacientes suelen sufrir diversos grados de dolor una vez que desaparece el efecto de la anestesia. La aromaterapia con copaiba, un enfoque no farmacológico, ofrece alivio a través de compuestos naturales como el beta-cariofileno y el alfa-humuleno, reduciendo eficazmente los niveles de dolor. Objetivo: El objetivo de este estudio era averiguar el efecto de la aromaterapia con copaiba en la escala de dolor de las pacientes posparto con cáncer de mama del Hospital Regional Prof. Dr. Margono Soekarjo Purwokerto. Método: Este estudio emplea un diseño de investigación pre-experimental, utilizando un enfoque de pre-prueba y post-prueba de un grupo. Se empleó un muestreo consecutivo para seleccionar a 41 encuestados. Los instrumentos de investigación consistieron en hojas de observación de la lista de comprobación de la escala de dolor y aromaterapia copaiba. El análisis estadístico incluyó análisis bivariados y pruebas t pareadas. Según los resultados, la mayoría de las encuestadas tenían entre 50 y 60 años, habían cursado estudios primarios, eran amas de casa y se habían sometido a intervenciones quirúrgicas previas. Se evaluó la escala de dolor antes y después de administrar aromaterapia de copaiba para comprobar
su eficacia en el tratamiento del dolor. Conclusión La aromaterapia con copaiba tiene un efecto en la reducción de la escala de dolor en las madres después de la cirugía de cáncer de mama.

**Palabras clave:** aromaterapia copaiba, dolor postoperatorio de heridas, Cáncer de Mama.

1 INTRODUCTION

In 2020, breast cancer accounted for 685,000 deaths globally, making it the leading cause of cancer-related mortality according to the World Health Organization (Shang & Xu, 2022; Sözen & Emir, 2023). According to the Cancer Registration Agency, the Association of Indonesian Pathology Specialists (IAPI) and the Indonesian Cancer Foundation (YKI), the prevalence of breast cancer in Indonesia is 12/100,000 women with a death rate of 18% (Ng et al., 2023; Solikhah et al., 2021). Globally, breast cancer constituted 16.6% of new cancer cases in Indonesia in 2020, totaling 68,858 cases out of 396,914 new cancer diagnoses, with over 22,000 deaths reported (Ferlay et al., 2019).

Efforts to prevent and treat breast cancer are crucial to reducing mortality rates, involving chemotherapy, immunotherapy, hormone therapy, and surgery (Burguin et al., 2021; García-Aranda & Redondo, 2019). Mastectomy, the surgical removal of the breast, is a common oncological procedure for breast cancer, involving the removal of breast tissue, areola, nipple, and surrounding skin, accompanied by axillary lymph node dissection (Al-Hilli & Wilkerson, 2021; Corradini et al., 2019; Magnoni et al., 2021).

Post-surgery, patients commonly experience pain ranging from mild to severe, hindering their recovery and mobility (Chen et al., 2020; Khan et al., 2020). Aromatherapy, specifically using copaiba essential oil has shown promise in pain reduction, attributed to its high content of beta-caryophyllene, which acts as a local anesthetic (Cirilo et al., 2024; Furlan et al., 2024; Johnson et al., 2020).

Data from Margono Soekarjo Hospital in Purwokerto revealed 547 breast cancer surgeries conducted in 2023, averaging 45 surgeries per month. Among post-surgery patients, pain levels varied, with four experiencing severe pain, five reporting moderate pain, and one with mild pain (RSMS medical records, 2023).

Continual pain post-surgery can impede mobility and recovery, highlighting the potential of copaiba aromatherapy as a non-pharmacological adjunct therapy, meriting further research.
2 METHODOLOGY

2.1 STUDY DESIGN

A quantitative research approach with a pre-experimental design employing a one-group pre-test and post-test using purposive sampling was conducted. Data were collected from January 1, 2023, to December 30, 2023.

2.2 SETTING AND PARTICIPANTS

Women were recruited from the oncology surgical wards (Class I, II, and III) at Prof Dr. Margono Soekarjo Purwokerto Hospital, Central Java Province, Indonesia. The eligibility criteria of participation were 1) Patient after breast cancer surgery, 2) Aged ≥ 18 years old, 3) Patients who have pain levels after breast cancer surgery on the first day that can be measured using a pain scale determined by the Numerical Rating Scale (NRS), 4) Patients who were willing and able to provide consent to participate in the study. Exclusion criteria are: 1) Patients with a history of severe allergic disorders to essential oils ingredient, 2) Patients undergoing Chinese medicine therapy, 3) Patients with a history of respiratory disorders that may affect the receipt of aromatherapy (e.g., severe asthma), 4) Patients with neurological disorders that may affect pain perception (e.g., peripheral neuropathy), 5) Patients who are or have used strong analgesic therapy that may affect pain measurements (e.g., fentanyl, MST), 6) Patients who cannot communicate well or have significant cognitive problems that may affect pain measurements.

The study population consisted of 547 patients, as identified from medical records spanning from. Sample size determination followed the Slovin formula, resulting in 41 samples selected based on predefined inclusion and exclusion criteria.

2.3 MEASUREMENTS

The research instrument employed was a Numerical Rating Scale (NRS) pain score observation sheet, administered before and after the intervention, in adherence to established operational standards (SOP) for copaiba aromatherapy administration.
2.4 STUDY PROCEDURE

Ethical approval was obtained from the Institutional Review Board of Prof Dr. Margono Soekarjo Purwokerto Hospital, Central Java Province, Indonesia (No. 420/02472). Additionally, permission to conduct the research was acquired from the heads of the hospital Prof Dr. Margono Soekarjo Purwokerto Hospital, Central Java Province, Indonesia prior to conducting the study. Data collection was carried out twice by measuring the pain scale using the Numeric Rating Scale (NRS). The first measurement is called the pre test and the second measurement is called the post test. The pre-test was carried out on the first post-operative day 6 hours after administering analgesics. After measuring the pain scale, the researchers administered copaiba aromatherapy for approximately 30 minutes. The post test is carried out after the aromatherapy administration is complete. The distance between the pre test and post test is 30 minutes. Pain scale measurements were carried out using the Numerical Rating Scale (NRS).

2.5 DATA ANALYSIS

The data were analysed using SPSS version 23. Descriptive statistics (frequencies, percentages, mean and standard deviation) were used to present demographic factors and health characteristics. Paired t-tests were utilized to determine the significance of the intervention's effect.

3 RESULTS

3.1 DEMOGRAPHIC FACTORS AND HEALTH CHARACTERISTICS

The research results revealed that the majority of respondents were aged between 50 and 60 years, comprising 23 individuals (56.1%). In terms of education, a majority of respondents had completed elementary school, totaling 21 participants (51.2%). Additionally, the predominant occupation among respondents was housewives, accounting for 26 individuals (63.4%). All 41 respondents (100%) had undergone previous surgery.
Table 1. Demographic Factors and Health Characteristics of Study Sample (n=41)

<table>
<thead>
<tr>
<th>Variable</th>
<th>Category</th>
<th>n</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age</td>
<td>18-34</td>
<td>2</td>
<td>4.9</td>
</tr>
<tr>
<td></td>
<td>35-49</td>
<td>16</td>
<td>39.0</td>
</tr>
<tr>
<td></td>
<td>50-60</td>
<td>23</td>
<td>56.1</td>
</tr>
<tr>
<td>Education</td>
<td>Uneducated</td>
<td>2</td>
<td>4.9</td>
</tr>
<tr>
<td></td>
<td>Elementary school</td>
<td>21</td>
<td>51.2</td>
</tr>
<tr>
<td></td>
<td>Junior high school</td>
<td>4</td>
<td>9.8</td>
</tr>
<tr>
<td></td>
<td>Senior high school</td>
<td>12</td>
<td>29.3</td>
</tr>
<tr>
<td></td>
<td>D3/S1</td>
<td>2</td>
<td>4.9</td>
</tr>
<tr>
<td>Work</td>
<td>Housewife</td>
<td>26</td>
<td>63.4</td>
</tr>
<tr>
<td></td>
<td>Employee</td>
<td>2</td>
<td>4.9</td>
</tr>
<tr>
<td></td>
<td>Farmer</td>
<td>4</td>
<td>9.8</td>
</tr>
<tr>
<td></td>
<td>Self-employed</td>
<td>8</td>
<td>19.5</td>
</tr>
<tr>
<td></td>
<td>civil servant</td>
<td>1</td>
<td>2.4</td>
</tr>
<tr>
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<td>Yes</td>
<td>41</td>
<td>100.0</td>
</tr>
<tr>
<td></td>
<td>No</td>
<td>0</td>
<td>0.0</td>
</tr>
</tbody>
</table>

Source: Primary Data, 2023

Respondents’ Pain Scale Before and After Giving Copaiba Aromatherapy

The majority of respondents reported moderate pain in the post-cancer surgery breast pain scale before receiving copaiba aromatherapy, accounting for 27 individuals (65.9%). Following copaiba aromatherapy administration, the majority experienced mild pain, with 26 respondents (63.4%).

Table 2. Respondents’ Pain Scale Before and After Giving Copaiba Aromatherapy (n=41)

<table>
<thead>
<tr>
<th>Variable</th>
<th>Pre-test</th>
<th>Post-test</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>f</td>
<td>%</td>
</tr>
<tr>
<td>Painful mild (scale 1-3)</td>
<td>7</td>
<td>17.1</td>
</tr>
<tr>
<td>Moderate pain (scale 4-6)</td>
<td>27</td>
<td>65.9</td>
</tr>
<tr>
<td>Painful heavy (scale 7-10)</td>
<td>7</td>
<td>17.1</td>
</tr>
<tr>
<td>Total</td>
<td>41</td>
<td></td>
</tr>
</tbody>
</table>

Source: Primary Data, 2023

4 DISCUSSION

The characteristics of the respondents in this study indicate an age range between 50 and 60 years. This finding aligns with previous research by Momenimovahed & Salehiniya (2019), which suggests that women entering menopause after age 55 are at a higher risk of developing breast cancer due to prolonged exposure to hormones (Momenimovahed & Salehiniya, 2019). Notably, a significant portion of breast cancer cases occurs in women aged 50 years or older. Furthermore, the majority of respondents in this study had elementary school education, comprising 51.2% of the sample, consistent with findings by Balekouzou et al. (2017), who observed a higher breast cancer
risk among individuals with lower education levels, possibly due to lifestyle, dietary, and
environmental factors (Balekouzou et al., 2017).

Regarding occupation, a majority of respondents were housewives (63.4%), a
demographic identified as having a heightened risk of breast cancer due to lower
socioeconomic status (Momenimovahed & Salehiniya, 2019). Additionally, all
respondents in this study had undergone previous surgical procedures, indicating prior
biopsy examinations to diagnose breast tumors, a practice recommended by Breast
Cancer Specialists, EUSOMA, to ensure accurate diagnosis (Bick et al., 2020).

The study results revealed that before receiving copaiba aromatherapy, the
majority of respondents experienced moderate post-breast cancer surgery pain,
accounting for 27 individuals (65.9%). However, after the intervention, a significant
decrease in pain scale was observed, with 26 respondents (63.4%) reporting mild pain.
This reduction in pain scale suggests that copaiba aromatherapy induced relaxation and
comfort among respondents, with some even reporting feelings of drowsiness. It is worth
noting that individual experiences and coping mechanisms influence pain perception
(Ardhiansyah, 2021), and aromatherapy's relaxing effects can contribute to pain reduction
(Lakhan et al., 2016). The use of copaiba oil, known for its anti-inflammatory and
antimicrobial properties, not only reduces pain but also promotes skin healing (Carvalho
et al., 2022; Frazão et al., 2023). Thus, copaiba aromatherapy proves effective in
alleviating post-breast cancer surgery pain and promoting recovery.

5 CONCLUSION

Copaiba aromatherapy significantly affects the pain scale among post-operative
breast cancer patients, indicated by a p-value of 0.000, signifying its significance at p <
0.05. Before Copaiba aromatherapy administration, the post-breast cancer surgery pain
scale predominantly fell within the moderate category, with 27 patients (65.9%).
Following treatment, the majority experienced a shift to the mild category, comprising 26
patients (63.4%). These findings underscore the effectiveness of Copaiba aromatherapy
as a viable intervention for pain reduction among post-operative patients, particularly
those undergoing breast surgery, suggesting its practical application in hospital surgical
wards.
REFERENCES


