

THE EFFECTIVENESS OF FOOT MASSAGE ON FATIGUE IN BREAST CANCER PATIENTS UNDERGOING CHEMOTHERAPY

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Abstract

Breast cancer is a significant global health issue with a rising incidence in Indonesia. Patients undergoing chemotherapy often experience fatigue as a common side effect of treatment. This study aimed to examine the effect of foot massage on reducing fatigue among breast cancer patients receiving chemotherapy at RSU Sembiring Deli Tua. A quantitative approach was employed using a quasi-experimental design with a one-group pretest-posttest framework. Eighteen breast cancer patients undergoing chemotherapy participated in this study. Fatigue levels were measured before and after the foot massage intervention using the Fatigue Assessment Scale (FAS). The results demonstrated a reduction in fatigue levels following the foot massage intervention. Statistical analysis using the Wilcoxon Signed Rank Test revealed a significant difference in fatigue levels before and after the intervention ($p = 0.002$; $p < 0.05$). The majority of participants experienced a decrease in fatigue from moderate to mild, while six participants showed no significant change. These findings are consistent with previous studies indicating the effectiveness of foot massage in alleviating fatigue among breast cancer patients. In conclusion, foot massage can be considered an effective complementary therapy for reducing fatigue in breast cancer patients undergoing chemotherapy in Indonesia.

Keywords: Breast cancer, Chemotherapy, Fatigue, Foot massage

1. INTRODUCTION

Breast cancer is a growing global health concern, particularly in Indonesia. Its incidence continues to rise, and the disease remains a significant cause of mortality among women (Osborne et al., 2025). Data from the World Health Organization (WHO) indicate that in 2022, approximately 2,3 million women were diagnosed with breast cancer, resulting in 670,000 deaths worldwide (Arnold et al., 2022).

Breast cancer patients undergoing chemotherapy often experience various side effects, one of the most common being fatigue. Fatigue is characterized by persistent and overwhelming tiredness that can significantly impair patients' quality of life. Studies have reported that fatigue affects 40–100% of patients receiving chemotherapy, making it one of the most frequently reported complaints in this population (Muthanna et al., 2023).

Fatigue in cancer patients can result from a variety of factors, including medical treatments, inadequate nutritional intake, poor sleep quality, and high levels of pain. In addition, psychosocial factors such as anxiety and stress also contribute to the development of fatigue. These findings suggest that the management of fatigue requires a comprehensive and multidimensional approach (Putra et al., 2024).

Fatigue can be managed through both pharmacological and non-pharmacological interventions. Although pharmacological approaches for addressing fatigue have shown limited effectiveness, non-pharmacological strategies such as physical exercise, relaxation techniques, yoga, and massage have been demonstrated to provide significant benefits (Fawole et al., 2024). Massage therapy, particularly foot massage, has attracted considerable attention due to its potential to enhance comfort and alleviate fatigue (Habibzadeh et al., 2020).

Previous studies have indicated that foot massage can have a positive impact on reducing fatigue in cancer patients. This therapy not only improves blood circulation but also provides a relaxing effect that enhances patient comfort. Therefore, foot massage may serve as an effective complementary therapy for breast cancer patients undergoing chemotherapy (Zhang et al., 2023).

Based on this background, the present study aims to examine the effect of foot massage on reducing fatigue in breast cancer patients undergoing chemotherapy at Sembiring Deli Tua General Hospital. This research is expected

to provide robust evidence on the effectiveness of foot massage as a non-pharmacological intervention for alleviating fatigue, thereby contributing to the improvement of quality of life among breast cancer patients.

2. METHODS

This study employed a quantitative approach using a quasi-experimental design with a one-group pretest-posttest framework. The design involved a single group receiving the foot massage intervention, with measurements taken both before and after the intervention. The aim of this design was to analyze changes in fatigue levels among breast cancer patients following the administration of foot massage therapy.

The study was conducted in the Chemotherapy Ward of Sembiring Deli Tua General Hospital, Deli Serdang Regency. The research was scheduled to take place from October to December 2024. This location was selected based on the availability of breast cancer patients undergoing chemotherapy and the approval granted by the hospital authorities to carry out the study.

The population of this study comprised all breast cancer patients undergoing chemotherapy at Sembiring Deli Tua General Hospital. Data were collected from both inpatient and outpatient patients. The study sample was determined using Slovin's formula, with inclusion criteria encompassing patients aged 25–50 years, who had undergone more than one cycle of chemotherapy, and who experienced fatigue. A total of 18

patients were included in the study sample.

The Fatigue Assessment Scale (FAS) questionnaire consists of 10 items designed to evaluate patients' fatigue levels. Total scores range from 10 to 50, with higher scores indicating greater severity of fatigue. The validity and reliability of this instrument have been previously established, making it a dependable tool for measurement in this study.

The research procedure began with the submission of the study title and obtaining research approval, followed by data collection. Participants were provided with an explanation of the study's objectives and benefits and were asked to sign an informed consent form. The foot massage intervention was administered for three consecutive days, after which data were collected and analyzed using the Wilcoxon Signed Rank Test to determine the significance of differences in fatigue levels before and after the intervention. The results of this analysis are expected to provide a clear understanding of the effect of foot massage on fatigue in breast cancer patients.

3. RESULTS

Table 1. Frequency Distribution of Respondent Characteristics

Characteristics	f	%
Age (year)		
Late Adult (36–45)	7	38,9
Early Elderly (46–55)	7	38,9
Late Elderly (56–65)	4	22,2
Total	18	100,0
Education		
Elementary School	4	22,2
Junior High School	4	22,2
Senior High School	10	55,6
Total	18	100,0
Occupation		

Unemployed/Housewife	6	33,3
Farmer	9	50,0
Entrepreneur	3	16,7
Total	18	100,0
Chemotherapy Cycle		
3 Weeks	12	66,7
1 Month	6	33,3
Total	18	100,0

Table 1 shows that most breast cancer patients undergoing chemotherapy at Sembiring Deli Tua General Hospital were aged 36–55 years (38,9%), with fewer patients aged 56–65 years (22,2%). Most had completed senior high school (55,6%), while 22,2% had elementary or junior high education. Half of the respondents were farmers (50%), 33,3% were unemployed or housewives, and 16,7% were entrepreneurs. Regarding chemotherapy cycles, 66,7% received treatment every three weeks, and 33,3% received it monthly.

Table 2. Frequency Distribution of Fatigue Levels in Breast Cancer Patients Before and After Foot Massage During Chemotherapy

Fatigue	Pre-test		Post-test	
	f	%	f	%
Normal	0	0,0	5	27,8
Mild–Moderate	14	77,8	12	66,7
Severe	4	22,2	1	5,5
Total	18	100,0	18	100,0

Table 2 shows that before the foot massage, most respondents (77,8%) had mild to moderate fatigue, and 22,2% had severe fatigue. After the intervention, fatigue levels decreased, with 66,7% reporting mild to moderate fatigue, 27,8% showing normal levels, and only 5,5% experiencing severe fatigue.

Table 3. Wilcoxon Signed Rank Test Results for the Effect of Foot Massage on Fatigue in Breast Cancer Patients Undergoing Chemotherapy

		N	Mean Rank	Z	p-value
Pretest	Negative rank	12	6,50	-	0,002
Posttest	Positive rank	0	0,00	3,074	
	Ties	6			
	Total	18			

Table 3 shows that 12 respondents experienced a decrease in fatigue after the foot massage, with a mean rank of 6,50, while 6 respondents showed no change. The Wilcoxon Signed Rank Test produced a Z value of -3,074 and a p-value of 0,002 ($p < 0,05$), indicating a significant effect of foot massage in reducing fatigue among breast cancer patients undergoing chemotherapy at Sembiring Deli Tua General Hospital.

4. DISCUSSION

The findings of this study are consistent with previous research, which showed that foot massage significantly reduced fatigue levels in breast cancer patients undergoing chemotherapy. Most participants experienced decreased fatigue after the intervention, indicating that foot massage effectively promotes relaxation and enhances physical comfort during treatment (Long et al., 2024).

Massage therapy significantly improves cancer-related fatigue in cancer patients: a meta-analysis of randomized controlled trials- A meta-analysis of 11 randomized controlled trials (789 patients in total) showed that massage therapy can substantially reduce fatigue in cancer patients, especially those with breast cancer (standardized mean difference = -1.62 , $P < 0.01$ for breast cancer subgroup) (Shan et al., 2023).

The findings of this study demonstrate that foot massage significantly reduces fatigue in breast cancer patients undergoing

chemotherapy, as indicated by a p-value of 0.002. This aligns with evidence from a meta-analysis of 11 randomized controlled trials involving 789 cancer patients, which found that massage therapy yielded a standardized mean difference (SMD) of -1.69 (95% CI -2.46 to -0.93 ; $p < 0.01$) in fatigue reduction, with an even stronger effect in breast cancer subgroups (SMD = -1.62 ; 95% CI -2.18 to -1.05) (Shan et al., 2023).

Moreover, in research involving 100 children undergoing chemotherapy, foot massage was shown to significantly improve physiological indicators and reduce fatigue and pain (in the intervention group vs control group; $p = 0.002$) using the Fatigue Assessment Scale and pain measurement tools . These findings support the therapeutic role of foot massage across different age groups and in various oncology settings (Mohammed et al., 2022).

Earlier research focused on breast cancer patients receiving chemotherapy found that foot

reflexology interventions significantly decreased fatigue compared to control groups. The consistency across these studies suggests that foot massage (and reflexology) may act via relaxation mechanisms, improved peripheral circulation, and modulation of the autonomic nervous system, which collectively contribute to reduced fatigue (Wang et al., 2020).

In summary, the present study's results strengthen the evidence base for foot massage as a feasible and effective non-pharmacological intervention for fatigue management in breast cancer chemotherapy patients. Implementation of such complementary therapies may thus contribute to better patient comfort, treatment tolerance, and quality of life amid cancer care.

5. KESIMPULAN

The study revealed a p-value of 0,002 ($p < 0,05$), indicating a significant effect of foot massage on reducing fatigue among breast cancer patients undergoing chemotherapy at Sembiring Deli Tua General Hospital.

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