

## *Effectiveness of Massage Therapy on Fatigue in Cancer Patients Undergoing Chemotherapy: Scoping Review*

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**Abstract:** Cancer patients undergoing chemotherapy have several side effects. Cancer patients felt side effects when undergoing chemotherapy, including nausea, vomiting, diarrhea, constipation, peripheral neuropathy, alopecia, pain, and fatigue. Fatigue is a condition that occurs in patients because the bone marrow stops producing red blood cells during the chemotherapy process. Fatigue can be severe when patients experience pain, depression, and lack of sleep. Fatigue management can be done with non-pharmacological therapy, one of the therapy is massage therapy. Massage therapy can be a manual stimulation of tissues in the body to improve blood circulation, relax muscles, reduce pain, reduce fatigue, and improve sleep quality. Massage therapy can overcome anxiety and reduce fatigue significantly. This study aims to analyze the effect of massage therapy on fatigue in cancer patients undergoing chemotherapy. The researchers used several databases such as Pubmed and Science Direct. A total of 9 articles were analyzed. In the article, there are several massage therapy interventions used to overcome fatigue in cancer patients including acupressure, reflexology, Thai massage, back massage, and progressive muscle relaxation. Based on several journals that have been analyzed, it can be concluded that the provision of massage therapy interventions can reduce fatigue in cancer patients.

**Keywords:** Cancer patients, chemotherapy, fatigue, massage therapy

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### INTRODUCTION

Cancer is an abnormal cell state in which there is uncontrolled proliferation and produces aggressive malignancies that cause high mortality ([Anand et al., 2023](#)). Worldwide cancer data (2020) estimates that there will be 18.1 million cancer cases worldwide in 2020. The high prevalence of cancer in the world is supported by data from [Riskseddas \(2018\)](#) which states that the frequency of cancer cases in Indonesia has risen from 1.4 per 1000 population in 2013 to 1.79 per 1000 population in 2018. According to the International Agency for Research on Cancer (IARC) in 2020, the most common types of cancer in Indonesia are breast cancer accounting for 16.6%, cervical cancer at 9.2%, and lung cancer at 8.8%.

One of the important interventions performed in cancer patients is chemotherapy ([Anand et al., 2023](#)). Chemotherapy aims to inhibit cell proliferation and tumor multiplication, to avoid cancer cell invasion and metastasis. Chemotherapy impacts not only cancer cells but also has the potential to affect normal cells. Administering chemotherapy at specific doses can alter the functional status of patients, leading to associated side effects ([Amjad et al., 2023](#)).

Side effects felt by cancer patients undergoing chemotherapy are nausea, vomiting, diarrhea, constipation, peripheral neuropathy, alopecia, pain and fatigue (Fatigue management can be done with non-pharmacological therapy. Non-pharmacological or complementary therapies offer a viable solution to address health issues in patients due to their relatively straightforward implementation, safety, and minimal side effects ([Yudha & Nurul Makiyah, 2021](#)). Complementary therapy is not a curative therapy, but a therapy that aims to ease the symptoms of the disease. Complementary therapy can also minimize the side effects of the therapy and can increase the welfare and quality of life of the patients. One of the

complementary therapies that can be performed on cancer patients undergoing chemotherapy is massage therapy.

Massage is one of the therapies performed by touching individuals through the skin with certain movements. Massage is a cheap and easy application without side effects, can reduce the stress response, and leads to muscle relaxation by reducing tension ([Toth et al., 2013](#)). Massage is the manual manipulation of body tissues for therapeutic purposes, it can improve blood circulation, relax muscles, reduce pain and fatigue, and improve sleep ([Ernst, 2009](#)). Massage therapy has several advantages for cancer patients undergoing chemotherapy.

Massage therapy when given during chemotherapy can overcome anxiety and reduce fatigue significantly ([Karagozoglu & Kahve, 2013](#)). Other research also found that massage therapy combined with progressive muscle relaxation can reduce pain and fatigue so that it can improve quality of life ([Dikmen & Terzioglu, 2019](#)). The results of other studies also show that foot massage can have significant effect on reducing fatigue in cancer patients after chemotherapy ([Alizadeh et al., 2021](#)). Many journals discuss the benefits various types of massage therapy for patients with cancer. Therefore, researchers are interested in examining how the effectiveness of massage therapy on fatigue in cancer patients undergoing chemotherapy.

## METHOD

This study is a scoping review, which provides a precise overview of the few previously available studies on a particular topic so it can provide information on new research areas to other researchers. Variables in this study are massage therapy and fatigue. Massage therapy is a complementary therapy that is carried out by touching the skin to create a comforting effect, meanwhile, fatigue is a feeling of tiredness due to physiological effects as well as side effects due to chemotherapy.

The purpose of this literature review is to identify the effectiveness of massage therapy on fatigue in cancer patients undergoing chemotherapy. The article search process was carried out through PubMed and Science Direct databases. Search strategy using a Boolean technique using the keywords Cancer OR Carcinoma AND Chemotherapy AND Massage OR Reflexology AND Fatigue.

The inclusion criteria for article searches were articles in full text, publications from 2013 to 2023, English language, experimental research methods, cancer patients undergoing chemotherapy, associated with massage therapy, and associated with fatigue. The exclusion criteria for this research article were articles that discussed the effects of non-specific massage therapy on fatigue. The detailed process of review is available in [Figure 1](#).

## RESULTS

### Research Characteristics

We analyzed a total of 9 studies in this literature review. These studies came from four countries, namely Turkey (n=3), Egypt (n=3), Iran (n=2), and Thailand (n=1). The majority of the studies were published in 2019. The research designs reviewed were experimental with RCT design (n=4), and Quasi Experiment (n=5). There were intervention and control groups in the reviewed studies. The intervention group received massage intervention, while the control group received standard care. The majority of instruments used to measure fatigue are the Visual Analog Scale (VAS) and Brief Fatigue Inventory (BFI). Most of the results showed that massage therapy reduced fatigue in cancer patients undergoing chemotherapy. More details can be seen in [Table 1](#).

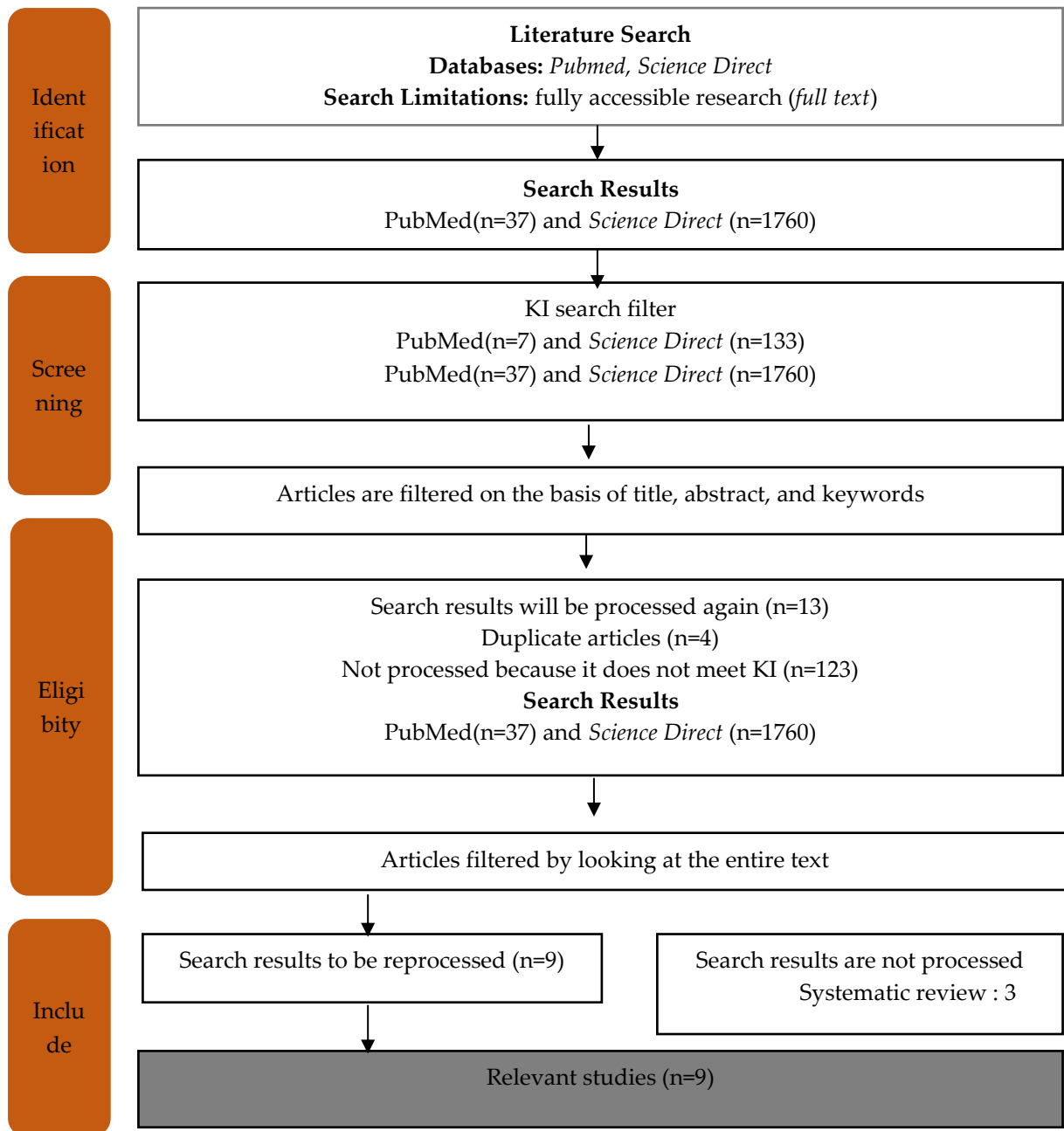


Figure 1  
Flow of Article Search with PRISMA

**Table 1. Research Characteristics**

Author (Year), country	Massage Method	Design	Instrument	Responden t	Results
<a href="#">(Khanghah et al., 2019)</a> Iran	Acupressure	Randomized Clinical Trial	Visual Analog Scale (VAS)	90 cancer patients undergoing chemotherapy.	The results indicated that following chemotherapy, the average visual analog scale for fatigue in the intervention group was notably lower compared to the control group (p = 0.028).
<a href="#">(Özdelikara &amp; Tan, 2017)</a> Turkey	Reflexology	Experimental	Rhoses index of nausea, vomiting, and retching (INVR), Brief Fatigue Inventory (BFI)	60 patients diagnosed with Stage I-III breast cancer undergoing chemotherapy.	The findings revealed a progressive decline in the mean score of BFI in an experimental group across the first, second, and third measurements (P < 0.05).
<a href="#">(Khiewkher n et al., 2013)</a> Thailand	Thai Massage	Randomized Controlled Trial	Numeric rating scale	66 patients with colorectal cancer.	Following the post-assessment, the level of fatigue in the intervention group was notably lower than that of the control group when compared to the pre-assessment results (P = 0.001).
<a href="#">(Karagozog lu &amp; Kahve, 2013)</a> Turkey	Back Massage	Quasi experiment	The State Anxiety State-Trait Anxiety Inventory (STAI), Brief Fatigue Inventory (BFI)	40 cancer patients undergoing chemotherapy in 1 day.	There was a statistically significant reduction in fatigue levels observed in the intervention group on the day following chemotherapy (p = 0.020; effect size = 0.84)..
<a href="#">(Alizadeh et al., 2021)</a> Iran	Foot massage	Quasi experiment	Visual Analogue Scale of Vafatigue (VAS-F)	88 gastrointestinal cancer patients.	A notable distinction in average fatigue scores emerged between the two groups following

<a href="#">(Kamal, 2018)</a> Mesir	Therapeutic massage	Quasi experiment	PedsQL Multidimensional Fatigue Scale	66 children with leukemia aged 4-16 years.	chemotherapy (P>0.001), as well as 24 hours post-chemotherapy (P<0.001). Within the intervention group, fatigue scores exhibited a gradual decrease (P = 0.031), whereas in the control group, there was an observed increase in fatigue scores (P = 0.001). Results showed that children in the intervention group had significantly lower fatigue (p=0.000) than children in the control group.
<a href="#">(Eladham et al., 2021)</a> Mesir	Reflexology	Quasi experiment	Rhoses index of nausea, vomiting, and retching (INVR), The brief fatigue inventory self report assessment tool (BFI)	50 respondents were breast cancer patients who are scheduled for chemotherapy	A remarkably substantial statistical distinction was observed between the intervention and control groups following the 2nd and 3rd foot reflexology interventions. difference pertained to the total experience score, occurrence and discomfort associated with nausea, vomiting, and retching, as well as the degree of fatigue and its impact on daily activities (P<0.001).
<a href="#">(Elkalashy &amp; Binshalan, 2019)</a> Mesir	Back massage	Quasi experiment	Rhodes Index of Nausea and Vomiting (RINV), Beck Anxiety Inventory (BAI), The Brief Fatigue Inventory (BFI)	98 respondents were breast cancer patients undergoing	Following the massage, a statistically noteworthy reduction in BFI scores was observed in the intervention

					chemothera py	group when compared to the control group ( $p \leq$ 0.001).
<a href="#">(Dikmen &amp; Terzioglu, 2019)</a> Turkey	Reflexology	Random ized controll ed trial	Brief Inventory Brief Inventory Multi dimensional Quality of Life Scale Cancer (MQOLS-CA)	Pain (BPI), Fatigue (BFI), ovarian and cervical cancer in grades I-III and treated with second or third cycle chemothera py	80 patient respondent s diagnosed with uterine, ovarian and cervical cancer in grades I-III and treated with second or third cycle chemothera py	In the reflexology and reflexology + Progressive Muscle Relaxation groups, a significant reduction in pain severity and fatigue was found and an increase in QoL ( $p < 0.05$ ).

### Types of Massage Therapy Interventions

The review results show that there are many types of massage therapy that can be performed on cancer patients undergoing chemotherapy. There are reflexology (n=4), back massage (n=2), acupressure (n=1), Thai massage (n=1), and therapeutic massage (n=1). Based on the results, the average massage therapy can be done once or twice a visit for 30-60 minutes. More details can be seen in [Table 2](#).

**Table 2: Types of massage therapy for chemotherapy patients**

Type intervention	time	Prosedur time
Acupressure	2 minutes/point	In the study, the investigator opted for three acupuncture points: hegu (located at the midpoint between the first and second metacarpals), zusanli (positioned one finger laterally below the tibial tuberosity and four fingers below the knee joint), and sanyigjiao (located four fingers above the medial ankle and behind the tibia). Pressure was administered at the commencement and conclusion of chemotherapy sessions. The technique involved delicately applying pressure to each designated acupoint using the finger, with the intensity gradually heightened until a pain sensation was perceived.
Reflexology/ foot massage	30-40 minutes	A reflexology session typically lasts for approximately 30-40 minutes, beginning with the right foot and then proceeding to the left foot. To facilitate a smooth experience, unscented baby oil at room temperature is employed. The session commences with the right foot, employing techniques such as effleurage, shaking, rotation, and stretching to relax the foot. Throughout the procedure, the researcher supports the patient's foot with one hand while using the fingers of the other hand, with a

		predominant use of the thumb technique.
	25-30 minutes/leg	Before initiating the reflexology session, the feet undergo relaxation through the application of effleurage, shaking, rotation, and stretching techniques. To trigger the release of endorphins and send messages throughout the body, pressure is applied to the "solar plexus" point. This involves the method of pressing and lifting the thumb three times.
	30 minutes	Foot hygiene was performed on all patients, and no creams or lotions were applied to their feet. All reflexology sessions began with applying controlled pressure using the thumb or index finger on the patient's foot. Then the reflex points on the right foot, such as the brain (frontal lobe), thyroid, upper lymph, and diaphragm, followed by the patient's left foot.
	20 minutes	In a PMR exercise session, the patient takes a deep breath as the muscle is tightened and exhales as it relaxes, progressing from the leg to the facial muscles (i.e., from bottom to top).
	56 minutes for 3 hours of chemotherapy	Foot massage is performed using superficial effleurage techniques with gentle pressure, deep effleurage with relatively harder pressure, petrissage techniques (movements from the soles of the feet to the shins using both palms of the therapist), friction techniques in the form of penetrating pressure with fingertips, and finally superficial effleurage massage. The massage starts from the right foot first and then continues with the left foot.
Thai Massage	45 minutes	The same experienced therapist conducted standardized massages on the head, neck, face, back, shoulders, arms, hands, lower legs, and feet using coconut oil infused with 0.05 ml of ginger oil. These massages were administered during three sessions for one week.
Back Massage	60 minutes for 2 hours chemotherapy	The massage begins with warming the hands by rubbing and applying Vaseline to make them slippery. The massage starts from the waist with a long effleurage and continues to the neck in a circular motion. Effleurage is the application of uninterrupted gliding movements that are repeated and follow the contours of the client's body. In the subsequent step, the researcher proceeded with the back massage using petrissage, involving the gripping of subcutaneous tissue and muscles using the thumb and other fingers. Following petrissage, the back massage transitioned to friction movements. The massage commenced from the sacroiliac junction, with the tips of the thumbs stacked, and circular friction movements were then applied with the fingertips along the spine towards the occipital region.
	75 minutes for 3 hours chemotherapy	
Therapeutic Massage	20 minutes	The massage therapy employed consisted of effleurage, petrissage, friction, and tapotement techniques, applying light to medium pressure and utilizing unscented olive oil. For

children, the massage covered the back, legs, arms, and neck, administered in three sessions—two before chemotherapy and one following chemotherapy.

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## DISCUSSION

Of the nine articles that the authors have discussed related to the effectiveness of massage therapy on fatigue in cancer patients undergoing chemotherapy, the results show that it is able to reduce the level of fatigue in cancer patients undergoing chemotherapy. The occurrence of fatigue in cancer patients is a common side effect of chemotherapy that adversely affects patients (Prieto-Callejero, et al, 2020). The frequent occurrence of fatigue in cancer patients has been described in a number of previous studies. Fatigue can occur in patients because the bone marrow will stop producing red blood cells during the chemotherapy process. This will cause the body to lack red blood cells, resulting in anemia and a decrease in the patient's energy level. Fatigue can be severe when patients experience pain, depression, and lack of sleep (Rishe, 2021).

Fatigue in cancer patients is caused by a hypermetabolic state associated with tumor growth, competition for nutrients between the body and the tumor, harmful effects of chemotherapy, and improper treatment with antitumor drugs associated with nausea and vomiting and anemia (Kamal, 2018).

Several studies have shown that massage therapy can reduce fatigue due to psychological factors and physiological effects of touch (Karagozoglul & Kahve, 2013). the implications of massage therapy in cancer patients undergoing chemotherapy can reduce fatigue and save costs and do not require professional and long-term education for patients and patients.

## CONCLUSION

Based on several journals that have been reviewed, it can be concluded that massage therapy is beneficial in reducing fatigue in cancer patients. Some of these massage therapy interventions can be used to be a supporting intervention or holistic intervention for cancer patients in overcoming fatigue due to the course of the disease and chemotherapy treatment.

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