



**THE EFFECTIVENESS OF MASSAGE THERAPY IN REDUCING FATIGUE
AMONG CANCER PATIENTS UNDERGOING CHEMOTHERAPY: SYSTEMATIC
REVIEW**

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ABSTRACT

Fatigue is one of the most common side effects experienced by cancer patients undergoing chemotherapy and has a serious impact on quality of life. Massage therapy has emerged as a potential non-pharmacological intervention to alleviate this symptom. Objective: To systematically review the effectiveness of massage therapy in reducing fatigue among cancer patients undergoing chemotherapy. Methods: This study employed a systematic review design based on the PRISMA guidelines. Literature was searched through PubMed, ScienceDirect, ProQuest, and Google Scholar databases. Articles published in English or Indonesian in the last 10 years (2014–2024). Included articles were randomized controlled trials (RCTs), quasi-experimental studies, or clinical trials evaluating the effects of massage therapy on fatigue in cancer patients. 139 Articles were found and 10 article were selected. Study quality was assessed using the CASP tool, and data were analyzed descriptively. Results: A total of 10 studies met the inclusion criteria. Findings showed that massage therapy—including slow-stroke back massage, Swedish massage, hand and foot massage, and combinations with aromatherapy—was effective in reducing fatigue. The effectiveness was influenced by the type of massage, duration, and frequency of the intervention. Conclusion: Massage therapy is an effective intervention that can be integrated into clinical care to reduce fatigue in chemotherapy patients. Further research is needed to strengthen the existing evidence.

Keywords: cancer; chemotherapy; fatigue; massage therapy; systematic review

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INTRODUCTION

Indonesia is a country with very rapid population growth. The population of Indonesia will reach 278.8 million people in 2023 (Hardianto, 2023). Most of Indonesia's population are toddlers. The number of toddlers in Indonesia in 2023 will reach 30.2 million people (10,91%) of the total population of Indonesia (Hardianto, 2023). Toddlers are the future of the nation, so the growth and development of toddlers is very important to pay attention to. In toddlers, there is a very rapid growth and development process, to support optimal growth and development, adequate nutrition and nutrition are needed (Setiawati, 2020). Toddlers are one of the groups that are vulnerable to nutritional problems (Indrayani, 2020). The number of toddlers experiencing malnutrition in Indonesia in 2023 was 21.6% (SGGI, 2023). The Semarang City Health Office recorded that in November 2023, 922 toddlers experienced nutritional problems (Semarang City Health Office, 2023). The results of a preliminary study conducted on 10 mothers of toddlers in the Krobokan Health Center Area found that 70% of toddlers were picky eaters and 30% of toddlers were not picky eaters.

Picky eater is an eating disorder in the form of being picky about food, only consuming certain types of food or spitting out food that has entered the mouth. If left untreated, it will cause nutritional status problems in toddlers. This is because there is an imbalance of nutrients in the body. Picky eaters are caused by several factors, one of which is parenting patterns. This is supported by research conducted by Handayani T., (2023), showing that parenting patterns are related to the nutritional status of toddlers. The role of the family is very important in handling toddlers with picky eaters. The family is the person who often interacts with toddlers, is closest to toddlers, and can understand toddlers' desires. This is what causes the importance of family parenting patterns in handling picky eaters in toddlers. Good parenting patterns will have a positive impact on children. So an intervention is needed to change the family's parenting patterns for children. Family Care Therapy (FaCe-T) is an intervention carried out by the family, while humanism is a behavior that humanizes humans. Humanistic Family Care Therapy (FaCe-T) is an intervention given by the family to toddlers with gentleness, attention, and affection that aims to change parenting patterns, especially in implementing toddler eating habits.

Family Care Therapy (FaCe-T) interventions implemented by families include hypnoparenting, Tui Na massage, and the application of feeding rules. Hypnoparenting is a hypnosis method that involves parents or toddler families by providing suggestions in the form of repeating words that are done when the toddler is sleeping (Kusumaningrum, 2015). Hypnoparenting carried out by parents to children with love will have a physical and psychological impact. Toddlers need to be stimulated to increase appetite with Tui Na massage (Munjidah, 2019). In addition, parents and families also apply feeding rules. Feeding rules are basic rules in feeding which include regular meal schedules or times, a pleasant environment (without distractions such as toys, cellphones), and correct eating procedures (not forcing children to eat and eating for no more than 30 minutes) (Ghinanda SR, 2022). Currently, there are still many parents who do not understand that parenting patterns can affect children's nutrition and growth and development. This study aims to analyze the effect of humanistic Family Care Therapy (FaCe-T), which utilizes an application, in improving the nutritional status of toddlers with picky eating habits.

METHOD

Research Design

This study uses a *systematic review* design that aims to identify, evaluate, and critically synthesize the results of previous research on the effectiveness of massage therapy in reducing fatigue in cancer patients undergoing chemotherapy. This design was carried out by following *the guidelines of Preferred Reporting Items for Systematic Reviews and Meta-Analyses* (PRISMA) as a standard reference in reporting the results of systematic reviews.

Article Selection Criteria

Inclusion criteria in this study include: Original research articles with *randomized controlled trial (RCT)*, *quasi-experimental*, or *clinical trial* designs. The population is cancer patients undergoing chemotherapy. The main intervention is massage therapy (in various forms). The main outcome measured was the level of fatigue assessed using standardized instruments. Articles published in English or Indonesian in the last 10 years (2014–2024).

Exclusion criteria: Studies that do not provide quantitative data on fatigue levels before and after the intervention. Studies in cancer patients who did not undergo chemotherapy. Articles in the form of editorials, non-systematic reviews, case reports, or conference proceedings.

Literature Search Sources and Strategies

Article searches are carried out through several online scientific databases, namely: PubMed, ScienceDirect, ProQuest, Google Scholar. Search keywords used include: ("*massage therapy*" OR "*massage*") AND ("*cancer*" OR "*chemotherapy*") AND ("*fatigue*" OR "*cancer-related fatigue*") AND ("RCT" OR "clinical trial"). The search was conducted in the month [month of implementation], and the reference list of relevant articles was also manually searched to identify additional literature.

Study Selection Procedure

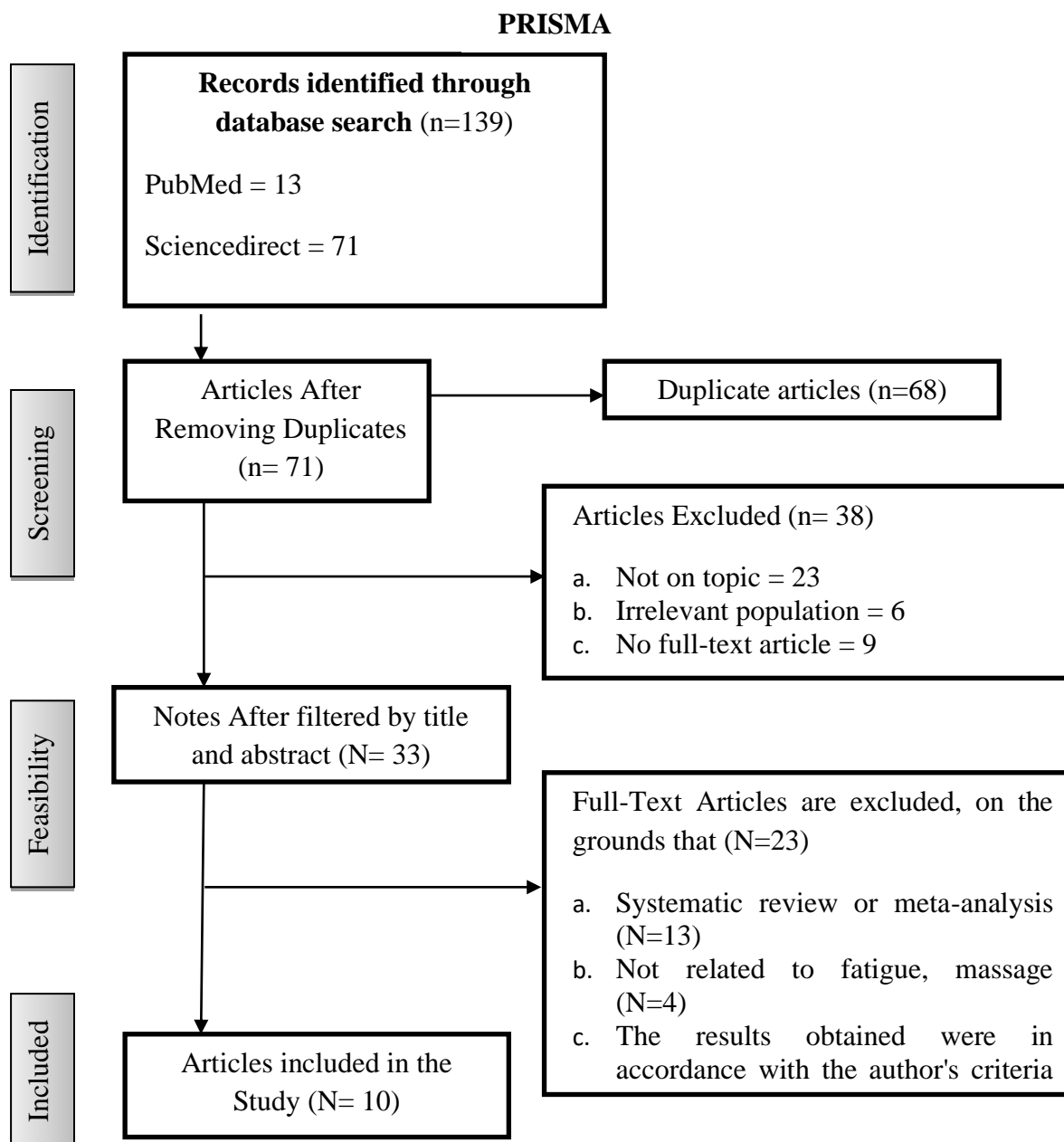
The selection process is carried out in three stages: Screening of titles and abstracts to get rid of irrelevant articles. Full-text assessment to ensure fit for inclusion criteria. And Data extraction using a systematic worksheet that includes: author name, year of publication, type of cancer, study design, type of massage, fatigue measurement instrument, details of the intervention, and key outcomes.

Study Quality Assessment

Each article that passed the selection was assessed for methodological quality using *the Critical Appraisal Skills Programme (CASP)* assessment tool for RCTs and *quasi-experimental studies*. The aspects evaluated included internal validity, bias, clarity of results, and relevance of findings to research questions.

Data Analysis

The data obtained are presented in the form of a table and analyzed in a qualitative descriptive manner. Findings were compared based on study design, type of massage, frequency of intervention, and effectiveness in reducing fatigue scores. If possible, a synthesis narrative is carried out to find a common pattern or conclusion of all studies studied.



Gambar 1. PRISMA Flow Chart

RESULT

It found 139 journals using journal search results based on the keywords that had been determined. After screening, 68 journals were duplicated. Critical analysis and bias sampling using CASP were then used to conduct a feasibility evaluation, with the result that 10 journals were suitable for further analysis, author name, year of publication, country of research, research design, and research findings were obtained from the articles found (Table 2).

Tabel 2.
Article Analysis

Title, Author, Year	Types of Cancer	Methods, Samples	Types of Massage	Measuring instruments used	Intervention	Result
<i>Slow-Stroke Back Massage Compared With Music Therapy for Leukemia-Related Pain and Fatigue: A Randomized Controlled Trial,</i> (Miladinia et al., 2021)	Leukemia	Randomized Trial, 104 Participants	Slow Stroke Back Massage	<i>Numeric self-report rating scales</i>	received a 15-minute intervention session, three times a week for 4 weeks, and control group participants received standard care. Cancer-related pain and fatigue intensity was measured by a numerical self-report rating scale. During the 4 weeks of the intervention, pain and fatigue intensity were measured weekly. All groups were followed up for 2 weeks after the intervention ended.	The intensity of pain and fatigue decreased significantly over time between the intervention groups compared to the standard care group. In the message and music therapy groups, a progressive reduction in pain intensity and fatigue over time (from the beginning to the fourth week) was observed. The intensity of fatigue did not differ between the two intervention groups. Pain intensity decreased more in the message group compared to the music therapy group. The long-lasting effects of message therapy were greater compared to music therapy 2 weeks after the intervention was completed.
<i>The effect of slow-stroke back massage on chemotherapy-related fatigue in women with breast cancer: An assessor</i>	Breast cancer	Randomized Controlled Parallel-Group Study, 64 Respondents	Slow Stroke Back Massage	<i>Brief Fatigue Inventory (BFI)</i>	Massage is given for a total of 20 minutes, of which 10 minutes before chemotherapy and 10 minutes after	The slow back massage applied from the second cycle of chemotherapy protocols significantly reduced the

Title, Author, Year	Types of Cancer	Methods, Samples	Types of Massage	Measuring instruments used	Intervention	Result
<i>blinded, parallel group, randomized control trial, (Bahceli et al., 2022)</i>					chemotherapy	level of fatigue due to chemoteapy. Based on the results of the study, we think that <i>slow back massage</i> for women with breast cancer can be safely integrated into clinical practice by certified nurses
<i>Effect of Somatosensory Interaction Transcutaneous Electrical Acupoint Stimulation on Cancer-related Fatigue and Immunity (Shu et al., 2022)</i>	Breast cancer	Randomized controlled trial, 300 respondents	Group Acupressure Massage (AM), and Pseudo Acupuncture Massage (FAM) and <i>Somatosensory Interaction Transcutaneous Electrical Acupoint Stimulation therapy</i>	<i>Piper Fatigue Scale</i>	Participants were divided into 3 groups, each group was given 3 different types of interventions, namely the Acupressure Massage (AM) Group, and the Pseudo Acupoint Massage (FAM) and <i>Somatosensory Interaction Transcutaneous Electrical Acupoint Stimulation</i> therapy with 1 session a day for 5 days in one week each with a total of 4 weeks of intervention, the duration of each session was 20 minutes	SI-TEAS has a good short-term effect in treating CRF because it relieves fatigue of tumor patients and improves their cellular immunity
<i>Effect of Massage Therapy on Minimizing Fatigue among Elderly Women with Breast Cancer (Hegazy et al., 2023)</i>	Breast cancer	Quasi Experimental, 67 Respondents	Swedish massage	<i>Revised Piper Fatigue Scale</i>	Swedish massage therapy is given for 12 sessions in 6 weeks, with a duration of 30 minutes each session	After 6 weeks of massage therapy, the fatigue score improved significantly in the study group (P>0.001) compared to the control group. While in the group comparison, there was a significant

Title, Author, Year	Types of Cancer	Methods, Samples	Types of Massage	Measuring instruments used	Intervention	Result
						improvement in post-intervention fatigue scores compared to pre-intervention fatigue scores for the study group at two time points (at week 3 and at week 6) ($P > 0.001$), while it was no different in the control group
<i>Determining massage dose-response to improve cancer-related symptom cluster of pain, fatigue, and sleep disturbance: A 7-arm randomized trial in palliative cancer care (Miladinia et al., 2023)</i>	All types of cancer	Randomized-Controlled Trial, 2017 Respondents	All types of massage	Numeric Rating Scales (NRS)	six different massage doses, which vary based on the frequency of sessions per week (2 or 3) and the duration of the massage per session (15, 30, or 60 minutes). Each dose is increased by 1.5 times compared to the previous dose	The findings suggest that dose escalation improves the efficacy of massage for the pain-fatigue-sleep symptom group. Although 60-minute doses have been found to be more effective, 30-minute doses can be considered more practical because they are cheaper and time-consuming.
<i>The effect of massage therapy on fatigue after chemotherapy in gastrointestinal cancer patients (Alizadeh et al., 2021)</i>	Gastrointestinal patients	Quasi-Experimental Study, 88 Participants	Foot massage	Visual analogue scale – fatigue (VAS-F)	Have four repeated 14-minute foot massage sessions (7 minutes for each leg) since starting the infusion. Foot massages were repeated every 40 minutes, at 54, 108, and 162 minutes, respectively. Therefore, according to the duration of chemotherapy, the patient had a total of 56 minutes of foot	There was a significant difference in mean fatigue scores between the two groups immediately after ($P > 0.001$) and 24 hours after chemotherapy ($P < 0.001$). In the intervention group, the fatigue score decreased gradually ($P = 0.031$), while it increased in

Title, Author, Year	Types of Cancer	Methods, Samples	Types of Massage	Measuring instruments used	Intervention	Result
<i>The effect of hand massage on fatigue in women with cancer receiving Brachytherapy : Randomized Clinical Trial</i> (Efe Arslan et al., 2025)	Gynecological cancer	Randomized-controlled trial, 24 respondents	Hand massage	<i>rief Fatigue Inventory (BFI)</i>	massage during a 3-hour cycle Application is carried out on each hand for 5 minutes, a total of 10 minutes in a group of hand massages. Hand massage was applied before each brachytherapy (in the first, second, and third sessions, a total of three times) daily for 1 week in the hand massage group	the control group (P = 0.001). It was determined that hand massage effectively controlled fatigue and the impact of fatigue on daily activities live. Hand massage is a safe and economical method that can be performed by a certified nurse.
<i>The Effect of Aromatherapy by Inhalation and Massage on Radiotherapy-induced Fatigue in Patients With Cancer</i> (Moradi et al., 2020)	All types of cancer	Randomized Clinical Trial, 105 Patients	Massage Effleurage	<i>Multidimensional Fatigue Inventory (MFI)</i>	The Effleurage massage is performed for 30 minutes, with rotating movements of the masseuse's thumb, using 3-5 cc of violin and almond oil at the Back-Shu Points (for three days, every day after radiotherapy).	Fatigue scores differed significantly in all three groups after both interventions (P<0/001), indicating a decrease in fatigue in the two test groups. However, according to Scheffe's post hoc test, massage aromatherapy is more effective in reducing fatigue from radiotherapy.
<i>The Effect of the Combined Intervention of Low-Intensity Exercise and Slow Stroke Back Massage (SSBM) on Physical Activity and Severity of Fatigue in the Patients Undergoing Chemotherapy</i> (Fazeli et al., 2021)	All types of cancer	Clinical Trial, 92 Patients	<i>Slow Stroke Back Massage (SSBM)</i>	<i>Piper Fatigue Scale (PFS)</i>	Each session takes 25 minutes which includes low-intensity exercises and SSBM. SSBM is performed in the form of superficial strokes and slow, gentle palm movements in patients at a steady pace of about 60 movements per	The results showed that the intensity of fatigue decreased in the experimental group, and there was a statistically significant difference between the two groups (P = 0.05). The trend of physical activity

Title, Author, Year	Types of Cancer	Methods, Samples	Types of Massage	Measuring instruments used	Intervention	Result
					minute for 10 minutes	increased in the experimental group; however, there was no statistically significant difference between the two groups (P = 0.68).
<i>Effect of swedish massage therapy on cancer-related Fatigue in chemotherapy patients</i> (Mostafa et al., 2023)	All types of cancer	Quasi-Experimental , 60 Patients	Swedish Massage	<i>rief Fatigue Inventory scale (BFI)</i>	One time for 20 minutes before starting chemotherapy infusions; (2) Two or three times each for 20 minutes during the chemotherapy infusion depending on the chemotherapy cycle given: after 25 minutes the first, second, and third hours start the chemotherapy infusion; and finally (3) One time for 20 minutes after completing the infusion	Swedish massage therapy was found to have a positive effect on reducing the intensity of cancer-related fatigue among the patients studied compared to the control group

DISCUSSION

Cancer-Related Fatigue (CRF) is one of the most commonly reported symptoms by cancer patients, especially those undergoing chemotherapy. Fatigue can be chronic and does not improve with rest alone, and has a major impact on patients' quality of life, functional capacity, and response to therapy (Bower, 2014). In an effort to manage CRF holistically, non-pharmacological approaches such as massage therapy have been extensively researched and applied as complementary interventions. Based on the results of several studies, massage therapy has been proven to be effective in reducing fatigue levels in cancer patients with various types and stages of the disease. The most common type of massage used in the intervention is Slow-Stroke Back Massage (SSBM). Research by Miladinia et al., (2021) in leukemia patients showed that SSBM for 15 minutes, three times a week for four weeks, was able to significantly reduce fatigue intensity compared to the control group. This effect even lasted two weeks after the intervention was completed. Similar results were reported by Bahceli et al., (2022) in breast cancer patients, where SSBM interventions before and after chemotherapy significantly lowered the Brief Fatigue Inventory (BFI) score.

In addition, acupressure and transcutaneous acupuncture point stimulation also showed positive results. Shu et al., (2022) examined the use of Somatosensory Interaction Transcutaneous Electrical Acupoint Stimulation (SI-TEAS) and found that this intervention

was effective in reducing fatigue and increasing cellular immunity in breast cancer patients. This research shows that technology can be integrated with touch therapy to produce optimal therapeutic effects. Another type of therapy that is often used is Swedish massage, as researched by Hegazy et al., (2023); and Mostafa et al., (2023) This therapy is given over several sessions and has been found to significantly reduce fatigue in breast cancer and cancer patients in general. These findings suggest that gentle and systematic rhythmic massage can stimulate the parasympathetic nervous system which plays a role in the process of relaxation and energy recovery.

Variations in the frequency and duration of massage therapy also affect the outcome of the intervention. Miladinia et al., (2023) conducted a randomized controlled trial with a seven-group design and found that increasing the dose of massage increased effectiveness in lowering cluster symptoms of pain, fatigue, and sleep disorders. Doses of 60 minutes per session are more effective, but 30-minute doses are considered more efficient and feasible to be applied in clinical practice. Local interventions such as foot massage and hand massage have also proven to be beneficial. Alizadeh et al., (2021) showed that foot massage during a chemotherapy cycle significantly lowered fatigue immediately and 24 hours after therapy. Similarly, Efe Arslan et al., (2025) concluded that hand massage can control fatigue and improve the daily activities of gynecological cancer patients, and is easily applied by trained nurses.

Meanwhile, the combination of massage with aromatherapy also amplifies the effect of reducing fatigue. Moradi et al., (2020) reported that effleurage massage accompanied by aromatherapy inhalation was significantly more effective than a single intervention in reducing fatigue induced by radiotherapy. The study by Fazeli et al., (2021) also demonstrated an integrative approach by combining low-intensity physical exercise and SSBM. As a result, there was a significant decrease in fatigue intensity, although increased physical activity did not show a significant difference between groups. Overall, almost all studies show that massage therapy in the form of slow-stroke massage, Swedish massage, local massage, and combination with other interventions has a significant impact on reducing fatigue in cancer patients. This makes massage therapy a non-invasive, safe, cost-effective approach, and can be easily integrated into the clinical practice of oncology nursing.

CONCLUSION

Based on the results of a systematic review of various studies evaluating the effectiveness of massage therapy in reducing fatigue levels in cancer patients undergoing chemotherapy, it can be concluded that massage therapy consistently shows significant benefits in reducing the severity of fatigue. The types of massage therapy used in the study included slow-stroke back massage, Swedish massage, acupressure massage, effleurage massage, and local massage of the hands and feet, with variations in duration, frequency, and method of execution. Massage therapy interventions have been proven to not only significantly lower fatigue scores, but are also safe, non-invasive, cost-effective, and easy to apply by healthcare workers, especially trained nurses. Some studies have even shown that massage therapy can provide short- to medium-term therapeutic effects, as well as improve other aspects such as sleep quality, cellular immunity, and physical activity.

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