

Review Article

The Effect of Acupressure on Fatigue in Cancer Patients: A Meta-analysis Study

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ABSTRACT

Objectives: This meta-analysis study was conducted to determine how acupressure affects fatigue in cancer patients.

Materials and Methods: Randomised controlled clinical trials were conducted using the keywords 'acupressure and fatigue' on Google Scholar, PubMed, and ISI Web of Sciences databases. Cochran's Q test statistics and I² test statistics were used to test the presence of heterogeneity. The random-effect meta-analysis model was used according to the results of the test for heterogeneity. Hedge's g test statistics were used to determine the joint effect between acupressure and control groups in the meta-analysis study.

Results: In this meta-analysis study, 409 patients from the acupressure group and 403 patients from the control group were included. When calculating the average standardised difference value of the acupressure versus the control group, it was determined that acupressure decreased the fatigue score in a statistically significant way.

Conclusion: Acupressure is an effective approach to alleviate cancer-related fatigue.

Keywords: Acupressure, Fatigue, Meta-analysis

INTRODUCTION

Cancer is one of the major diseases that threaten human health and affects the lives of patients biologically, psychologically, socially, and economically. According to the latest data from the World Health Organization, it has been determined that 19.2 million people have been diagnosed with new cancer.^[1]

Cancer-related fatigue is the most commonly reported symptom of cancer and cancer treatment.^[2,3] While up to 90% of patients suffer from fatigue symptoms during the treatment stage,^[4] this rate is estimated to occur in 27–82% of patients after treatment.^[5] Fatigue symptom is seen in 97% of advanced cancer patients.^[6]

Although the aetiology of cancer-related fatigue is exactly unknown,^[3] there is evidence that it is associated with many biological processes, including immune response, inflammation, metabolic, neuroendocrine, and dysfunction within the central nervous system as well as elevations in specific neurotransmitters and metabolites.^[7-9]

The management of cancer-related fatigue includes pharmacotherapy, haemoglobin elevation, exercise, energy conservation, activity management, psycho-educational interventions, diet and nutrition management, sleep therapy, management of disturbing symptoms, and complementary and alternative medicine.^[10] Amongst these methods, exercise (aerobic and resistance training), cognitive behavioural therapies, and psychoeducational therapies are currently the only standard evidence-based recommendations for the treatment of cancer-related fatigue.^[11]

Various complementary and alternative therapies are generally used to manage the side effects and symptoms of cancer treatments, including fatigue.^[12] Acupressure is a complementary therapy based on traditional Chinese medicine's theory of energy pathways and on the premise that restoring proper energy flow through these pathways can contribute to health and well-being as well as the reduction of physical symptoms.^[13,14] Acupressure includes applying pressure to specific points of the body using the

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hands, fingers, thumbs, elbows, feet or various devices.^[15,16] Acupressure is non-invasive and typically painless and side effects associated with the insertion of fine needles can be prevented.^[16]

It is emphasised that acupuncture point stimulation may have a promising role in the management of cancer-related fatigue.^[17] In studies, acupressure has been used in various patient populations to treat a variety of symptoms and the study results have indicated that acupressure can help reduce stress, pain, and anxiety.^[18-21]

The studies have supported the promising role of acupressure in the management of fatigue in cancer patients.^[22-24] In light of this information, this meta-analysis study was conducted to determine how acupressure affects the management of fatigue in cancer patients.

MATERIALS AND METHODS

Data searches and study selection

Randomised controlled clinical trials were conducted using the keywords 'acupressure and fatigue' on Google Scholar, PubMed, and ISI Web of Sciences databases. This meta-analysis involved only studies comparing the experimental group and the control group. Selection criteria were randomised trials including adults suffering from fatigue and conducted with at least one group treated with acupressure. Studies that were written in English and whose full text can be accessed were included in this meta-analysis study.

As a result of screening with keywords in the PubMed database, nine randomised controlled trials were reached. As a result of the screening made from the Web of Sciences database, 116 randomised controlled studies were reached. As a result of screening from the Google Scholar database, 14000 results were found. After selecting studies in oncology patients and removing identical studies, 18 studies remained. The full text of two of these studies could not be reached. One of them was removed because their language was not written in English. As a result, 15 studies were included in the meta-analysis [Figure 1].

Data analysis

Cochran's Q test statistics and I^2 test statistics were used to test heterogeneity so that it was determined whether the effect size was significantly different from the studies in the meta-analysis or not. The random-effect meta-analysis model was used according to the results of the test for heterogeneity. Hedge's g-test statistics were used to show the joint effect between acupressure therapy and control groups in the meta-analysis.

RESULTS

Characteristics of studies

Table 1 shows the characteristics of the studies included in the meta-analysis. In a randomised controlled study, the participants were evaluated into three groups. Acupressure

was applied on the acupoints of Zusanli (ST-36), Hegu (LI-4), and Sanyinjiao (SP-6) in the acupressure group ($n = 30$). Sham pressure was used in the placebo group ($n = 30$) and no intervention was applied in the control group ($n = 30$). The fatigue levels of the participants in three groups were calculated in three phases: Before, during, and after chemotherapy. As a result of the study, it was reported that the fatigue level of the acupressure group was statistically significantly lower than the levels of the other groups.^[22]

Similarly, in another study, patients were evaluated in three groups including relaxation acupressure ($n = 12$), low-dose stimulating acupressure ($n = 11$), and high-dose stimulating acupressure ($n = 12$). Those in the high-dose stimulating acupressure group and the relaxation acupressure group applied acupressure to themselves twice a day. The low-dose stimulating acupressure group applied acupressure to themselves 3 times a week. As a result of the study, it was reported that the fatigue level of the relaxation acupressure group was statistically significantly lower than the levels of the other groups.^[23]

In another study evaluating the effectiveness of relaxation acupressure application, patients were evaluated in three groups relaxation acupressure group ($n = 98$), stimulating acupressure group ($n = 94$), and control group ($n = 96$). It was reported that the fatigue levels of the relaxation acupressure group and the stimulating acupressure group were significantly lower when compared to the control group.^[24] In another randomised controlled study, patients were evaluated into three groups acupressure ($n = 16$), acupuncture ($n = 15$), and sham acupressure ($n = 16$). Fatigue levels improved significantly in the acupressure group.^[25] Similarly, in another study of three groups, it was reported that there was no significant difference in terms of fatigue level.^[26]

In four of the other randomised controlled studies on two groups, it was reported that the level of fatigue in the acupressure group statistically significantly improved.^[27-30] In the other randomised controlled study, no significant difference was reported.^[31]

Effects of acupressure on fatigue

In the meta-analysis examining the effect of acupressure on fatigue in cancer patients, 15 randomised controlled trials were included. Of 409 patients from the acupressure group and 403 patients from the control group were evaluated.

When the effect of acupressure on fatigue was assessed, it was observed that the groups had a heterogeneous distribution ($Q = 68.686$, $P < 0.001$; $I^2 = 79.665\%$). The random-effect model was used in the meta-analysis and Figure 2 shows the comparison of acupressure and control groups as a result of the analysis (95% confidence interval, $-0.7,92--0.156$; $P = 0.003$).

DISCUSSION

Acupressure is a complementary therapy based on traditional Chinese medicine's theory of energy pathways and on the premise that restoring proper energy flow through these

Table 1: The characteristics of the studies included in the meta-analysis.

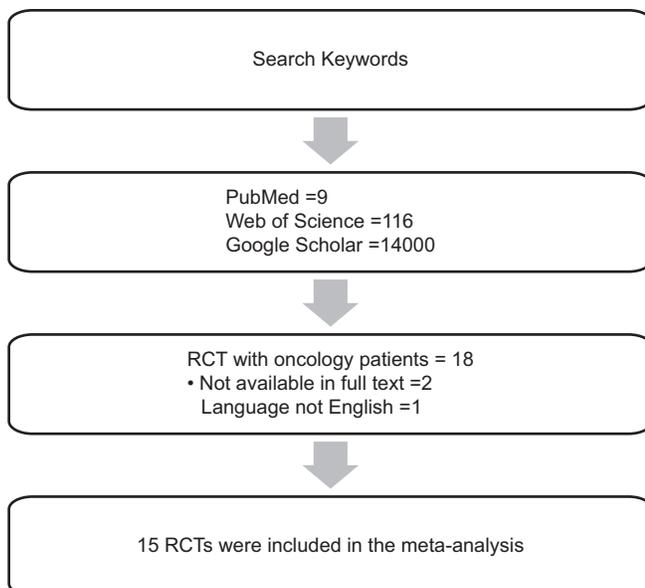
Study	Intervention	Control	Outcome
Khanghah <i>et al.</i> , 2019a	Acupressure <i>n</i> =30 Zusanli (ST-36), Hegu (LI-4) and Sanyinjiao (SP-6). Each point bilaterally for 2 min during and after chemotherapy.	Sham acupressure <i>n</i> =30	The fatigue level of the acupressure group was statistically significantly lower. A visual analogue scale was used.
Khanghah <i>et al.</i> , 2019b	Acupressure <i>n</i> =30 Zusanli (ST-36), Hegu (LI-4) and Sanyinjiao (SP-6). Each point bilaterally for 2 min during and after chemotherapy	Usual care <i>n</i> =30	The fatigue level of the acupressure group was statistically significantly lower. A Visual analogue scale was used.
Zick <i>et al.</i> , 2011a	Relaxation acupressure <i>n</i> =12 Yin tang, anmian (bilaterally), heart 7 (bilaterally), liver 3 (bilaterally), and spleen 6 (bilaterally) twice a day	Low-dose stimulating acupressure <i>n</i> =11 Stomach 36 (bilaterally), spleen 6 (bilaterally), kidney 3 (bilaterally), large intestine 4 (bilaterally), conception vessel 6, and governing vessel 20. 3 times a week	Fatigue level was significantly lower in the relaxation acupressure group. A brief Fatigue Inventory was used.
Zick <i>et al.</i> , 2011b	Relaxation acupressure <i>n</i> =12 Yin tang, anmian (bilaterally), heart 7 (bilaterally), liver 3 (bilaterally), and spleen 6 (bilaterally) Twice a day	High-dose stimulating Acupressure <i>n</i> =12 Stomach 36 (bilaterally), spleen 6 (bilaterally), kidney 3 (bilaterally), large intestine 4 (bilaterally), conception vessel 6, and governing vessel 20. twice a day	Fatigue level was significantly lower in the relaxation acupressure group. A brief fatigue inventory was used.
Zick <i>et al.</i> , 2016a	Stimulating acupressure <i>n</i> =94 Du 20, conception vessel 6, large intestine 4, stomach 36, spleen 6, and kidney 3. Once per day Each point is in a circular motion for 3 min.	Usual care <i>n</i> =96	At week 10, the change in fatigue score from baseline was greater in stimulating acupressure compared to usual care. A brief Fatigue Inventory was used.
Zick <i>et al.</i> , 2016b	Relaxing acupressure <i>n</i> =98 Yin tang, anmian, heart 7, spleen 6, and liver 3. Once per day Each point is in a circular motion for 3 min.	Usual care <i>n</i> =96	At week 10, the change in fatigue score from baseline was greater in relaxing acupressure compared to usual care. A brief fatigue inventory was used.
Molassiotis <i>et al.</i> , 2007a	Acupressure group <i>n</i> =16 LI-4 (Hegu), SP-6 (Sanyinjiao), ST-36 (Zusanli) Each point for 1 minute, daily for 2 weeks.	Acupuncture group <i>n</i> =15 LI-4, SP-6 and ST-36	Fatigue level improved significantly in the acupressure group. Multidimensional fatigue inventory was used.
Molassiotis <i>et al.</i> , 2007b	Acupressure group <i>n</i> =16 LI-4 (Hegu), SP-6 (Sanyinjiao), ST-36 (Zusanli) Each point for 1 minute, daily for 2 weeks.	Sham acupressure <i>n</i> =16	Fatigue level improved significantly in the acupressure group. Multidimensional Fatigue Inventory was used.
Tang <i>et al.</i> , 2014a	Acupressure <i>n</i> =24 Hegu (LI-4), Zusanli (ST-36) and Sanyinjiao (SP-6)	Sham acupressure <i>n</i> =16	No statistically significant difference was found Tang fatigue rating scale was used.
Tang <i>et al.</i> , 2014b	Acupressure with essential oils <i>n</i> =17 Hegu (LI-4), Zusanli (ST-36) and Sanyinjiao (SP-6)	Sham acupressure <i>n</i> =16	No statistically significant difference was found Tang fatigue rating scale was used.

(Contd...)

Table 1: (Continued).

Study	Intervention	Control	Outcome
Yeh <i>et al.</i> , 2016	Auricular acupressure <i>n</i> =16 HT-7 (Shenmen), MA-TF1 (sympathetic), AT-3 (occiput) 3 min per time, 3 times per day, once a week for 4 weeks	Sham acupressure <i>n</i> =15	Fatigue level improved significantly in the acupressure group. M.D. Anderson symptom inventory was used.
Yorke <i>et al.</i> , 2015	Acupressure <i>n</i> =50 L-7 (Lieque), L-9 (Taiyuan), LI-4 (Hegu), CV-21 (Qianding), GV-22 (Xinhui), ST-36 (Zusanli) Each point for 1 minute at least twice a day for 4 weeks	Usual care <i>n</i> =51	At week 12, fatigue level improved significantly in the acupressure group. Functional assessment of cancer therapy fatigue was used.
Özdemir and Taşçı, 2023	Acupressure <i>n</i> =15 Hands and legs (LI-4, SP-6, ST-36) 3 min twice daily, for 4 weeks	Usual care <i>n</i> =16	Fatigue level improved significantly in the acupressure group. A Piper fatigue scale was used.
Cheung <i>et al.</i> , 2022	Acupressure <i>n</i> =15 Two 2 h training sessions in self- administered acupressure in 1 week (4 h) Three 1 h weekly follow-up visits for reinforcing practice over 3 weeks (3 h) 15 minutes of self-administered acupressure twice a day after completing the two training sessions	Health education <i>n</i> =15 Usual care and it was contacted in the 3rd week to attend a health talk unrelated to symptom management	No statistically significant difference was found. Self-administered acupressure intervention was used.
Zhang <i>et al.</i> , 2017	Acupressure <i>n</i> =21 LI-4 (Hegu), ST-36 (Zusanli), SP-6 (Sanyinjiao) Each acupoint for 10 min (30 min/d), 3 d weekly for 12 weeks	Sham acupressure <i>n</i> =22	Fatigue level improved significantly in the acupressure group. Multidimensional fatigue inventory was used.

a: The first group compared within the same study with more than one group (Placebo+experiment+control etc.), b: Second group compared in the same study with more than one group (Placebo+experiment+control etc.)

**Figure 1:** Flow diagram of study inclusion and exclusions. RCT: Randomized controlled trial.

pathways can contribute to health and well-being as well as the reduction of physical symptoms.^[13,14]

Results of the studies have indicated that acupressure can help reduce stress, pain, and anxiety.^[18-21] There are studies showing that acupressure is not effective in managing fatigue in cancer patients.^[26,31] On the contrary, there are studies reporting that acupressure is effective in managing fatigue in cancer patients.^[22-24,27-30]

As a result of a meta-analysis, it was reported that acupuncture and related treatments were effective in reducing pain and fatigue and enhancing quality of life in cancer patients.^[32]

In a systematic review, it was found that acupuncture and acupressure tended to be effective in relieving fatigue in cancer patients.^[33] In a meta-analysis study, it was reported that acupressure was an effective approach to alleviating cancer-related fatigue.^[34]

CONCLUSION

Similar to the result of this meta-analysis, it was determined that it was an effective approach to reducing fatigue in cancer

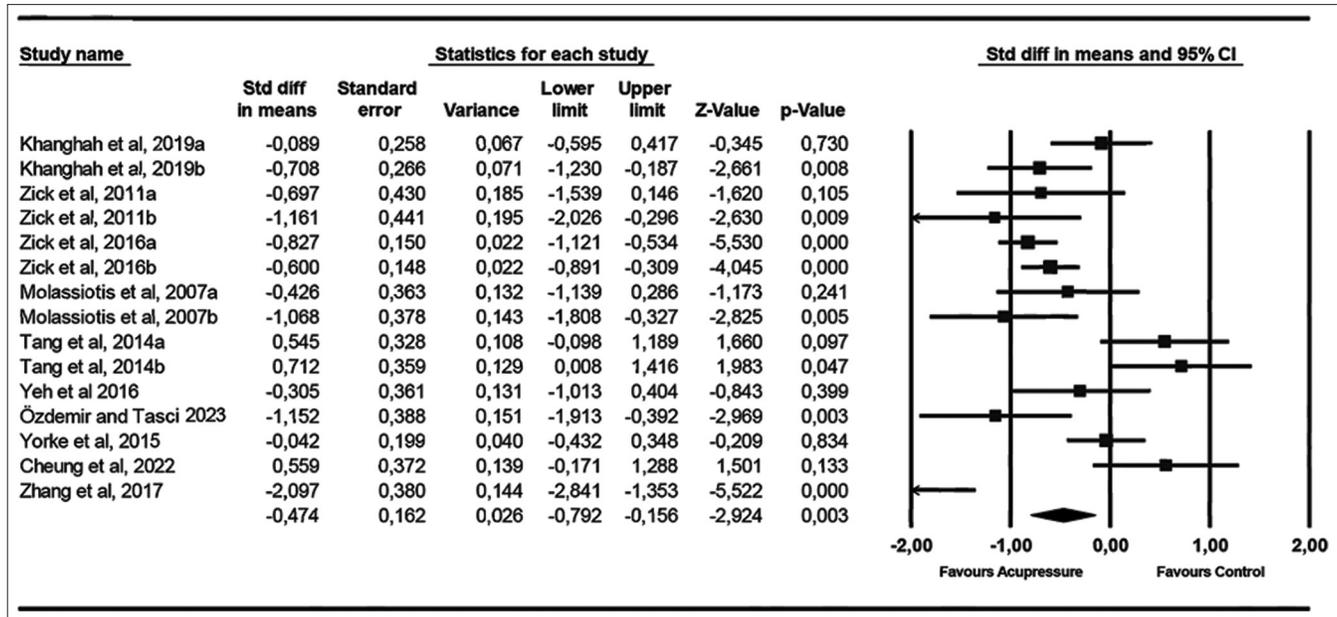


Figure 2: Forrest plot showing changes acupressure between fatigues. CI: Confidence interval. a: The first group compared within the same study with more than one group (Placebo+experiment+control etc.), b: Second group compared in the same study with more than one group (Placebo+experiment+control etc.).

patients. To minimise the risk of bias, we included only randomised controlled trials in the meta-analysis study. It is recommended to repeat the meta-analysis with a larger sample size in the future as the number of studies increases. In future studies, repeating meta-analysis with studies using the same acupressure points may be useful for understanding the mechanism of action.

Ethical approval

The Institutional Review Board approval is not required.

Declaration of patient consent

Patient's consent not required as there are no patients in this study.

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Conflicts of interest

There are no conflicts of interest.

Use of artificial intelligence (AI)-assisted technology for manuscript preparation

The author confirms that there was no use of artificial intelligence (AI)-assisted technology for assisting in the writing or editing of the manuscript and no images were manipulated using AI.

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