

Table 1: Systematic reviews of Aromatherapy

Source: Dana Mora, CAM Cancer Collaboration. [Aromatherapy](#) [online document], 23rd June 2025.

- Anxiety, depression and psychological wellbeing p. 1
- Chemotherapy-induced nausea vomiting p. 4
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- Fatigue / sleep p. 6
- Various outcomes p. 9

Anxiety, depression, and psychological wellbeing

Methods	Included studies	Results and conclusions	Comments
Li D, Li Y, Bai X, et al. The Effects of Aromatherapy on Anxiety and Depression in People With Cancer: A Systematic Review and Meta-Analysis . Front Public Health. 2022;10:853056. doi: 10.3389/fpubh.2022.853056. (Li 2022b)			
<p>Type of review: Systematic review</p> <p>Search strategy</p> <p>Databases PubMed, Web of Science, Cochrane Library, Embase, Medline, EBSCOhost, ProQuest, Scopus.</p> <p>Dates Searched from inception to 31 May 2021</p> <p>Limits English language; full text</p> <p>Data synthesis Meta-analysis</p> <p>Risk of bias assessment RoB v1</p> <p>Inclusion criteria</p> <p>Populations Cancer patients, no restrictions on cancer type, sex or age or race.</p> <p>Interventions Aromatherapy inhalation and/or massage therapy with essential oils. No restrictions on type of essential oils.</p> <p>Comparisons Routine care, placebo or other controls.</p> <p>Outcomes Depression, anxiety or psychological wellbeing outcomes using validated tools.</p>	<p>Studies and participants 17 RCTs, 10 RCTs included in MA, 1611 participants</p> <p>Interventions Massage aromatherapy (9 RCTs), inhaled aromatherapy (6 RCTs), both massage and inhalation (2 RCTs). Single essential oil (9 RCTs), mixture of essential oils, (6 RCTs), not specified (2 RCTs). Lavender essential oil most frequently used. Duration heterogeneous: from a single application to 10 weeks, most common 4 weeks.</p> <p>Comparisons Usual care (7 RCTs), no additional control (5 RCTs), fraction and pure essential oils (1 RCT), carrier oils (2RCTs), saline solution (1 RCT), CBT (1 RCT).</p> <p>Outcome measures Anxiety: SAI, HADS, VAS, POMS, BAI, QAI. Depression: CES-D, HADS, POMS. Psychological wellbeing: RSCL, POMS, BAI, CES-D.</p> <p>Measure of treatment effect SMD 95% CI p value, differences in score changes from baseline to post-intervention between groups.</p>	<p>Results for outcome measures:</p> <p>Anxiety (15 RCTs) Significant improvements (SMD=-0.49, 95% CI -0.96- -0.02, p<0.05) Subgroup analysis: most effective aromatic massage (SMD=-0.70, p<0.005), aromatherapy with lavender essential oils (SMD=-1.12, p<0.01), short-time interventions (duration<4weeks) (SMD=-0.87, p<0.05) and studies in Asia (SMD=-0.83, p<0.05).</p> <p>Depression (6 RCTs) No differences between groups, no MA conducted.</p> <p>Psychological well-being (5 RCTs) No differences between aromatherapy and control groups.</p> <p>Results for risk of bias assessment of primary studies included in review Random sequence generation was high risk for two trials. Blinding was high-risk for four trials. The blinding method of the evaluator was high risk in one trial. Four trials had low risk for allocation concealment. Fifteen trials had low risk of reporting bias.</p> <p>Conclusions: "In cancer patients, aromatherapy was effective in relieving anxiety. However, there was no beneficial effect on depression and psychological well-being."</p>	<p>Quality assessment of the SR: moderate</p> <p>Strengths Subgroup analyses were performed to explore potential sources of heterogeneity and to examine the effects of specific variables like study location, essential oils, type of aromatherapy, and duration of intervention.</p> <p>Limitations The quality of the included RCTs was low. For the majority of studies selection bias was unclear. Large variety between interventions and outcome measurement tools. High heterogeneity among the included studies, which could not be explained by subgroup and sensitivity analyses. The authors did not register a protocol for this review.</p>

<p>Liu T, Cheng H, Tian L, et al. Aromatherapy with inhalation can effectively improve the anxiety and depression of cancer patients: A meta-analysis. Gen Hosp Psychiatry. 2022. doi: 10.1016/j.genhosppsych.2022.05.004. (Liu 2022)</p>			
<p>Type of review: Systematic review</p> <p>Search strategy:</p> <p>Databases Chinese National Knowledge Infrastructure (CNKI), Wanfang database, Chinese science, and Technology Journal Full-text Database (VIP), Chinese biomedical database (CBM), Cochrane Library, PubMed Embase and PsycINFO</p> <p>Dates Searched from inception to October 2021</p> <p>Data synthesis Meta-analysis</p> <p>Risk of bias /quality assessment Cochrane risk-of-bias tool for randomized trials (RoB)</p> <p>Inclusion criteria:</p> <p>Population Adults (≥18 yrs), diagnosis of cancer (any type and stage), at any stage of any treatment. Diagnosis and/or symptoms of anxiety or depression. No language restrictions.</p> <p>Interventions or exposures Aromatherapy intervention included regardless of form, frequency, duration, program length of the aromatherapy.</p> <p>Comparators or controls Usual care, using placebo.</p> <p>Outcome Anxiety or depressive symptoms as primary or secondary outcomes containing extractable scores.</p>	<p>Studies and participants: 19 RCTs, 11 RCTs included in MA, 1724 participants</p> <p>Interventions: 7 RCTs inhalation aromatherapy, 4 aromatherapy massage. Single essential oils (8 RCTs), compound essential oils (3 RCTs). Interventions lasted from 5 min-24 hrs. Frequency of interventions 1-7 times per week for 3-6 weeks.</p> <p>Control: 3 RCTs placebo (2RCTs sweet almond oil, 1 RCTs coconut oil), 8 RCTs usual care.</p> <p>Outcome measures: Anxiety (10 RCTs): SAI, SAS, HADS. Depression (5 RCTs): CES-D, HADS, HAMD, SDS.</p> <p>Measure of treatment effect: Weighted mean difference (WMD) and 95% CI. The standardized mean difference (SMD) was used if the outcome assessment tools were different.</p>	<p>Results for outcome measures:</p> <p>Anxiety</p> <p><u>Overall results</u> Effective for anxiety [SMD=-0.51, 95%CI (-0.83, -0.19), P=0.002]</p> <p><u>Subgroup analyses</u> Effect on perioperative cancer patients [SMD=-0.91, 95%CI (-1.55, -0.27), P <0.01] but no effect for palliative care patients [SMD=-0.03, 95%CI (-0.22, 0.17), P=0.77] and radiotherapy or chemotherapy [SMD=-0.56, 95%CI (-1.13, 0.00), P=0.05].</p> <p>Compared to placebo intervention aromatherapy had no effect on anxiety [SMD=-0.06, 95%CI (-0.24, 0.12), P=0.49] but improved anxiety when compared to usual care [SMD=-0.83, 95%CI (-1.31, 0.35), P<0.01].</p> <p>Inhalation aromatherapy had an effect on anxiety symptoms [SMD=-0.86, 95%CI (-1.45, -0.26), P<0.01] but aromatherapy massage had no effect on anxiety [SMD=-0.17, 95%CI (-0.34, 0.00), P=0.05].</p> <p>Interventions of <3 weeks and >3 weeks had effect on anxiety [SMD=-0.79, 95%CI -1.52, -0.05, P<0.05; SMD=-0.24, 95%CI (-0.47, -0.02), P<0.05, respectively].</p> <p>Depression</p> <p><u>Overall</u> Aromatherapy appeared to be effective for depression [SMD=-0.44, 95%CI (-0.76, -0.12), P=0.008] symptoms in cancer patients.</p> <p><u>Subgroup analyses</u> Inhalation aromatherapy had an effect on depressive symptoms [SMD=-0.54, 95%CI (-1.06, -0.02), P<0.05].</p> <p>Aromatherapy massage a small effect on depression SMD=-0.21, 95%CI (-0.37, -0.06), P<0.01.</p>	<p>Quality assessment of the SR: low</p> <p>Strengths The authors conducted analysis to assess publication bias and subgroup analysis. Authors reported information on adverse effects.</p> <p>Limitations Authors did not register a protocol. The heterogeneity among the included studies was high. This study showed a mild publication bias. The quality of the included studies was low.</p>

		<p>Interventions of <4 weeks had no effect on depression [SMD=-0.13, 95%CI (-0.28, 0.02), P =0.10] while interventions of >4 weeks had an effect on depression SMD=-0.79, 95%CI (-1.05, -0.54), P <0.01.</p> <p>Results for risk of bias assessment of primary studies included in review:</p> <p>Risk of performance bias was high in all studies. The blinding method of the evaluator was low risk in 2 studies. Seven trials were low risk and one high-risk for random sequence generation. Five trials had low risk for allocation concealment. Three trials were a high risk of reporting bias. One trial had a high risk for other bias.</p> <p>Conclusions</p> <p>Aromatherapy, especially in the form of inhalation aromatherapy, may be used as a beneficial complementary therapy to improve symptoms of cancer-related anxiety and depression in clinical settings. However, aromatherapy massage appears to be less effective. Anxiety symptoms improved in cancer patients in perioperative patients.</p>	
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Chemotherapy-induced nausea and vomiting

Design and methods	Included studies	Main results and conclusions	Comments
<p>Ahn JH, Kim M, Kim RW. Effects of aromatherapy on nausea and vomiting in patients with cancer: A systematic review and meta-analysis of randomized controlled trials. Complement Ther Clin Pract. 2024. doi: 10.1016/j.ctcp.2024.101838. (Ahn 2024)</p>			
<p>Type of review: Systematic review</p> <p>Search strategy</p> <p>Databases PubMed, MEDLINE, EMBASE, CINAHL, Cochrane Library, Web of Science</p> <p>Dates Searches from inception to April 30, 2023.</p> <p>Data synthesis Meta-analysis</p> <p>Risk of bias /quality assessment Cochrane risk-of-bias tool for randomized trials (RoB 2)</p> <p>Inclusion criteria:</p> <p>Population Adult (±18 yrs) cancer patients, undergoing treatment or completed treatment.</p> <p>Interventions Administered as essential oil, any application (inhalation and/or massage).</p> <p>Aromatherapy not part of combination treatment.</p> <p>Controls Routine/usual care, placebo, no control intervention.</p> <p>Outcome Nausea, vomiting, or both.</p> <p>Studies with missing data for meta-analysis were excluded.</p>	<p>Studies and participants 10 RCTs included, 1288 participants</p> <p>Intervention massage aromatherapy (2 RCTs), inhalation therapy (8 RCTs), peppermint, other single oils (4 RCTs), blended oils (2 RCTs)</p> <p>Control Placebo (5 RCTs), usual care (4 RCTs), untreated (2 RCTs).</p> <p>Outcome measures: Nausea (7 RCTs): VAS, Edmonton Symptom Assessment Scaled revised, EORTC-QoL, index of nausea vomiting and retching, Baxter Retching Faces.</p> <p>Vomiting (3 RCTs): Frequency, index of nausea vomiting and retching.</p> <p>Measure of treatment effect SMD; Hedges's g and 95% CI.</p>	<p>Results for outcome measures:</p> <p>Overall nausea and vomiting: significantly reduced (SMD=-0.81, 95 % CI - 1.11, -0.52)*.</p> <p>Nausea reduced (SMD=-0.85, 95 % CI -1.23, -0.46)</p> <p>Combined nausea and vomiting reduced (SMD=-1.08, 95 % CI:-1.68, -0.47),</p> <p>Vomiting alone not significantly reduced (SMD =-0.24, 95 % CI -1.03, 0.55).</p> <p>For inhalation -0.79 (95 % CI -1.11, -0.47) and massage groups -1.06 (95 % CI -2.04, -0.07), there was an effect in reducing nausea, vomiting, or both. No significant differences were noted between the two groups ($p=0.610$).</p> <p>In terms of essential oil used, peppermint oil and other single oils groups were -1.09 (95 % CI -1.54, -0.63) and -0.56 (95 % CI -1.01, -0.11), respectively; both types exerted a significant effect. No effect was noted for the blended oil group. No statistically significant differences were noted among the three groups ($p=0.261$).</p> <p>For the type of cancer treatment, for chemotherapy, there was an effect -0.97 (95 % CI -1.31, -0.63); No effect was noted for other treatments.</p> <p>Results for risk of bias assessment of primary studies included in review: Two RCTs were judged to have some concerns of bias in the randomization process. The remaining four domains were judged to have a low risk of bias. Overall, eight of the 10 RCTs were judged to have a low risk of bias, whereas two RCTs were judged to have some concerns of bias.**</p> <p>Conclusions: Aromatherapy had a large effect size for reducing overall nausea and vomiting in patients</p>	<p>Quality assessment of the SR: low</p> <p>Strengths: Reported adverse effects from aromatherapy.</p> <p>The authors conducted analysis for publication bias.</p> <p>Limitations: Concerns about the RoB assessment: although 8 RCTs compared aromatherapy to no treatment or routine care, the authors report low risk of bias for blinding. Very unusual that all RCTs were of low risk of bias for all domains (except 2 RCTs for randomization). Reported high certainty of results for overall n&v, and nause therefore needs to be viewed with great caution.</p> <p>No p-values reported for effect sizes.</p> <p>There was high heterogeneity among the included studies.</p> <p>Studies were excluded if data for MA were missing.</p> <p>RoB assessment inadequate, e.g. described as blinded despite open-label design.</p> <p>The studies included had small sample size</p>

		<p>with cancer. Furthermore, aromatherapy was found to be effective in reducing nausea. In studies that measured both nausea and vomiting, aromatherapy also demonstrated a large effect size. Studies that measured vomiting alone showed no effect. Additionally, both inhalation and massage aromatherapy were effective, particularly in patients receiving chemotherapy; peppermint essential oil was the most effective.</p>	
<p>Toniolo J, Delaide V, Beloni P. Effectiveness of Inhaled Aromatherapy on Chemotherapy-Induced Nausea and Vomiting: A Systematic Review. J Altern Complement Med. 2021. doi: 10.1089/acm.2021.0067 (Toniolo 2021)</p>			
<p>Type of review: Systematic review</p> <p>Search strategy</p> <p>Databases PubMed, Scopus, Cochrane Database, Embase, CINAHL, and Google Scholar</p> <p>No restriction on publication date</p> <p>The date range of the search was not reported by the authors</p> <p>Data synthesis Narrative synthesis.</p> <p>Risk of bias /quality assessment Cochrane Risk of Bias tool 2.0</p> <p>Inclusion criteria</p> <p>Population Patients who had been diagnosed with cancer who were undergoing chemotherapy treatment. Studies in English or French. Children studies were included.</p> <p>Interventions or exposures Inhaled aromatherapy</p> <p>Comparators or controls Not stated by the authors</p> <p>Outcome Nausea and vomiting.</p> <p>Excluded Other routes of administration, other complementary medicines combined with aromatherapy.</p>	<p>Studies and participants 8 RCTs, 2 quasi-experimental, 1 quasi-randomized, 869 participants (86 children, 783 adults).</p> <p>Intervention Inhaled aromatherapy. 2 RCTs used essential oil diffuser, 9 studies used direct or essential oil inhalation. Ginger (3 studies) and peppermint (2 studies). One study used a blend of oils. Intervention varied from once a day to as many times as necessary.</p> <p>Control Placebo (6 studies)</p> <p>Outcome measures VAS for nausea and vomiting and frequency to assess CINV. RINV, Pediatric Nausea Assessment Tool, and Multinational Association of Supportive Care in Cancer (MASCC) Antiemetic Tool. The Edmonton Symptom Assessment System scale.</p> <p>Measure of treatment effect Due to the heterogeneity of the studies, an MA was not conducted. A descriptive statistical analysis was done.</p>	<p>Results for outcome measures Direct or dry inhalation: 7/9 studies showed statistically significant results in adults. 4/7 alleviated both nausea and vomiting using peppermint, and ginger essential oil; 3 decreased nausea only with chamomilla, ginger, or cardamom essential oil.</p> <p>Atmospheric diffusion and the use of inhaled aromatherapy in children did not show any benefit.</p> <p>Results for risk of bias assessment of primary studies included in review Four studies low risk of bias, six studies some concerns, one study was high risk.</p> <p>Conclusions: It is not possible to generalize the different results to the treatment of all CINV and the authors cannot definitely conclude the effectiveness of inhaled aromatherapy.</p>	<p>Quality assessment of the SR: Low</p> <p>Strengths: Reported adverse effects from aromatherapy.</p> <p>No conflict of interest was declared in this article.</p> <p>The authors stated no funding was received for this article.</p> <p>Limitations: Small samples and a wide variety of interventions were studied making it impossible to generalize these results.</p> <p>Due to the variability of the scales used to measure the outcome a quantitative synthesis of the studies was not performed</p> <p>For five of the studies, the randomization was questionable.</p> <p>Several studies had small sample sizes.</p>

Sleep/fatigue			
Design and methods	Included studies	Main results and conclusions	Comments
Ahn JH, Kim M. Effects of Aromatherapy on Cancer Patients' Sleep and Fatigue: A Systematic Review and Meta-Analysis. J Integr Complement Med. 2023. doi: 10.1089/jicm.2022.0601. (Ahn 2023)			
<p>Type of review: Systematic review</p> <p>Search strategy</p> <p>Databases MEDLINE, PubMed, CENTRAL, EMBASE, CINAHL, and Web of Science; and Korean databases: RISS, KISS, NDSL, and KoreaMed.</p> <p>Dates 2010 to January 31, 2022</p> <p>Data synthesis Meta-analysis</p> <p>Risk of bias /quality assessment Cochrane RoB2</p> <p>Inclusion criteria</p> <p>Population Adults (≥18 yrs) currently undergoing any cancer treatment.</p> <p>Interventions or exposures Any aromatherapy delivery type using any aroma oil.</p> <p>Comparators or controls Routine care, placebo, standard nursing care or no intervention.</p> <p>Outcome Sleep or fatigue.</p>	<p>Studies and Participants 11 RCTs, 1033 patients, various cancers.</p> <p>Intervention Inhalation (7 RCTs) and massage (3 RCTs). Oils included lavender, lavender with chamomile, peppermint, bergamot, or orange, or a blend of mint, chamomile, jasmine, violet, rosemary, and eucalyptus (four studies). Rosa and ginger were also used alone in one study. The number of intervention sessions ranged widely from 1 to 34, with an average of 9.27 sessions.</p> <p>Control Placebo, standard nursing care, routine care, or no intervention.</p> <p>Outcome measures Sleep (10 RCTs): Pittsburgh Sleep Quality Index (PSQI), Richards-Campbell Sleep Questionnaire (RCSQ), and European Organization for Research and Treatment of Cancer Quality of Life questionnaire (EORTC QLQC30).</p> <p>Fatigue (4 RCTs): EORTC QLQC30, Brief Fatigue Inventory (BFI), and Multidimensional Fatigue Inventory (MFI).</p> <p>Measure of treatment effect SMD, 95% CI, Hedges g.</p>	<p>Results for outcome measures Aromatherapy was shown improvement in sleep compared with the control group in seven studies. SMD -0.92 (95% CI -1.39 to -0.46, p<0.001).</p> <p>Aromatherapy was found to be ineffective in reducing fatigue (SMD=-0.40, 95% CI -0.81 to 0.01, p=0.05).</p> <p>Subgroup analysis Type of delivery method: the mean effects (Hedges' g[^]) were -1.10 (95% CI -1.71 to -0.49) for inhalation and -0.61 (95% CI -1.50 to 0.29) for massage. ANOVA showed no significant differences between the types of delivery methods (Q= 0.78, df=1, p=0.375).</p> <p>Type of aroma oil: mean effects (Hedges' g[^]) were -1.58 (95% CI -2.35 to -0.82) for using lavender oil, whereas the use of mixed oil or other oils, such as Rosa or ginger, did not improve sleep quality.</p> <p>Meta-ANOVA showed that there were no significant differences in sleep quality based on the type of aroma oil used (Q= 4.95, df=2, p=0.084).</p> <p>Cancer treatment modality: mean effects (Hedges' g) were -1.20 (95% CI -1.85 to -0.54) for chemotherapy, whereas for other treatments (palliative care, surgery, clinical treatment, or completed treatment) it was not effective. No significant differences based on the cancer treatment modality (Q= 1.45, df=1, p=0.227).</p> <p>Results for risk of bias assessment of primary studies included in the review: Six studies showed low-risk assessment and five showed some concerns</p> <p>Conclusions: Aromatherapy significantly improves sleep quality among cancer quality among cancer patients. However, aromatherapy does not significantly reduce fatigue among cancer patients"</p>	<p>Quality assessment of the SR: Low</p> <p>Strengths The authors accessed the heterogeneity of the studies and conducted a subgroup analysis. No conflict of interest was declared in this article. The authors stated no funding was received for this article.</p> <p>Limitations Most of the studies included had a small sample size. Few studies were included in the MA for fatigue.</p>

<p>Cheng H, Lin L, Wang S, et al. Aromatherapy with single essential oils can significantly improve the sleep quality of cancer patients: a meta-analysis. BMC Complement Med Ther. 2022 doi: 10.1186/s12906-022-03668-0. (Cheng 2022)</p>			
<p>Type of review: Systematic review</p> <p>Search strategy</p> <p>Databases Cochrane Library, PubMed, Embase, CBM, Wanfang, VIP, and CNKI.</p> <p>Searched from inception to November 2021</p> <p>Data synthesis Meta-analysis</p> <p>Risk of bias /quality assessment Cochrane Assessment Tool (RoB)</p> <p>Inclusion criteria:</p> <p>Population Adults ≥ 18 years old, diagnosed with cancer and met the diagnostic criteria for sleep disorders (regardless of age, gender, ethnicity, cancer type, cancer stage and current form of treatment).</p> <p>Interventions or exposures Aromatherapy</p> <p>Comparators or controls Usual care (basic nursing, psychological nursing, health education) or placebo</p> <p>Outcome Sleep quality as a primary or secondary outcome</p>	<p>Studies and participants 10 RCTs, 933 participants</p> <p>Intervention 9 RCTs inhalation aromatherapy, and 1 RCT massage. Frequency 1-7 times per week. Dosage aroma oil 2-8 drops per time.</p> <p>Control 7 RCTs usual care, 3 RCTs placebo.</p> <p>Outcome measures Richards-Campbell Sleep Questionnaire (RCSQ) 2 RCTs and the Pittsburgh Sleep Quality Index (PSQI) 8 RCTs.</p> <p>Measure of treatment effect Standardized mean difference (SMD) and their 95% confidence interval (95% CI).</p>	<p>Results for outcome measures: Sleep quality significantly improved [SMD=- 0.79, 95% CI (- 0.93, - 0.66), $p < 0.01$], especially those with breast cancer [SMD=- 0.98, 95% CI (- 1.57, - 0.40), $p < 0.01$], digestive system cancers [SMD=- 0.58, 95% CI (-0.98, - 0.18), $p < 0.01$] and mixed cancer types [SMD=- 0.58, 95% CI (- 0.87, - 0.30), $p < 0.01$].</p> <p>Aromatherapy improves sleep quality of those undergoing chemotherapy SMD=- 0.94, 95% CI (- 1.29, - 0.58), $p < 0.01$ and for patients in perioperative period [SMD=- 0.92, 95% CI (- 1.55, - 0.30), $p < 0.01$].</p> <p>Single essential oil aromatherapy had a better effect on sleep quality SMD=-0.94, 95% CI (- 1.25, - 0.62), $p < 0.01$], of which lavender essential oil had the best effect SMD=-1.06, 95% CI (- 1.49, - 0.63), $p < 0.01$ while compound essential oils had no effect on sleep quality improvement SMD=-0.21, 95% CI (- 0.57, 0.14), $p = 0.23$.</p> <p>Adverse events: 4/10 RCTs reported the occurrence of adverse events, of which only one RCT indicated that patients had headaches and sneezing, while the remaining six did not.</p> <p>Results for risk of bias assessment of primary studies included in review: Eight studies reported the method of random sequence, one had an unclear risk, and one had a high risk of bias. Five trials reported allocation concealment methods. All ten trials had a high risk of bias for blinding. Three trials reported blinding of outcome assessment, while the rest had an unclear risk of bias. Two trials were rated unclear in terms of other sources of bias the other eight trials had a low risk of bias. For selective reporting, the risk of bias was low. For incomplete outcome data, all ten trials were rated low risk. Overall, the risk of bias in the included studies was moderate.</p> <p>Conclusions Aromatherapy with single essential oil has a substantial effect on the sleep quality of cancer patients.</p>	<p>Quality assessment of the SR: Low</p> <p>Strengths Adverse events were reported in this review</p> <p>Limitations The authors excluded studies from the qualitative analysis because they could not be included in the meta-analysis.</p> <p>Most of the included studies had a small sample size.</p> <p>There is moderate publication bias</p>

Pain			
Design and methods	Included studies	Main results and conclusions	Comments
Corasaniti MT, Bagetta G, Morrone LA, et al. Efficacy of Essential Oils in Relieving Cancer Pain: A Systematic Review and Meta-Analysis. Int J Mol Sci. 2023 doi: 10.3390/ijms24087085. (Corasaniti 2023)			
<p>Type of review: Systematic review</p> <p>Search strategy</p> <p>Databases: PubMed/MEDLINE, Scopus, and WOS</p> <p>Searched from inception to 3 February 2023</p> <p>Data synthesis Narrative synthesis and meta-analysis for six studies.</p> <p>Risk of bias /quality assessment Cochrane risk of bias tool RoB2</p> <p>Inclusion criteria:</p> <p>Population Patients suffering from cancer pain during or after treatments.</p> <p>Prospective and retrospective clinical studies</p> <p>Interventions or exposures Essential oils administered in any dose and route.</p> <p>Comparators or controls Placebo, no treatment, or active control.</p> <p>Outcome Pain reduction</p>	<p>Studies and participants: 12 studies (8 RCTs, 1 non-randomized CT, 3 quasi-experimental)</p> <p>Intervention Essential oils are administered in any dose and route.</p> <p>Inhalation (5 RCTs, 2 quasi experimental, 1 nonrandomized), massage (2 RCTs, 1 quasi experimental), 1 RCT gargle.</p> <p>Control Placebo (2 RCT), Standard care (2 RCTs, 1 quasi experimental), usual or routine care (1 RCT, 1 non-randomized, 1 quasi experimental) or active control (3 RCT, 1 quasi experimental).</p> <p>Outcome measures Pain reduction. VAS (7 RCTs, 1 non-randomized, 1 quasi experimental), Numeric rating scale (1 RCT), douleur neuropathique 4 questions (1 quasi experimental), verbal rating scale (1 RCT)</p> <p>Measure of treatment effect Relative risk (RR) with 95% CI</p>	<p>Results for outcome measures Essential oils showed effectiveness in reducing the intensity of pain associated with cancer (SMD -1.94, CI -3.18, -0.70, $p=0.002$).</p> <p>Results for risk of bias assessment of primary studies included in review: The overall quality risk assessment for this review assessed three studies as low risk and nine as unclear risk. Randomization was assessed as high-risk in four studies</p> <p>Conclusions Although the study demonstrates efficacy of essential oils in the reduction of pain intensity associated with cancer, there is a need for homogeneous, appropriately designed clinical trials.</p>	<p>Quality assessment of the SR: moderate</p> <p>Strengths: The authors followed the PRISMA guidelines.</p> <p>Limitations: The small number of studies eligible for the analysis does not allow for planning a sensitivity analysis, restricting the primary analysis to low-risk-of-bias studies or following subgroup analysis or meta-regression based on stratification of the studies.</p> <p>Most of the studies included had small sample sizes.</p>

Various outcomes

Design and methods	Included studies	Main results and conclusions	Comments
Liu Y, Xu M, Tian Q, et al. Effects of Aromatherapy on Physical and Psychological Symptoms in Cancer Patients: A Systematic Review and Meta-analysis. <i>Cancer Nurs.</i> 2024 doi: 10.1097/NCC.0000000000001384 (Liu 2024)			
<p>Type of review: Systematic review</p> <p>Search strategy</p> <p>Databases PubMed, EMBASE, Web of Science, and Cochrane Library. Included studies reference list.</p> <p>Dates Searched from inception to March 20, 2022</p> <p>Data synthesis Meta-analysis</p> <p>Risk of bias /quality assessment Cochrane Risk-of-Bias Assessment Tool, version 2 (RoB2)</p> <p>Inclusion criteria</p> <p>Population Adults (≥18 yrs old), diagnosis of cancer (any type and stage), at any stage of any treatment.</p> <p>Interventions or exposures Aromatherapy without any restrictions on the delivery mode, aroma preparations, and doses of preparation.</p> <p>Comparators or controls Either active control (e.g. placebo control, other interventions, or conventional medicines) or passive control (such as usual care, no intervention, and wait-list).</p> <p>Outcome studies assessed one of depression and anxiety symptoms, nausea and vomiting symptoms, fatigue, pain symptoms, sleep quality, and quality of life.</p> <p>Studies were excluded if they were on the use of aromatherapy during cancer surgery.</p>	<p>Studies and participants 26 RCTs, 2320 participants.</p> <p>Intervention 8 RCTs single aromatic agent (lavender, peppermint, ginger, rose), 18 RCTs used two or more aromatic agents.</p> <p>Administered by: Inhalation 15 RCTs Massage 14 RCTs Oral administration 2 RCTs</p> <p>Length of the delivery ranged from 1 day to 6 weeks, the length of the session ranged from 2 to 60 mins.</p> <p>Control Placebo (water, fragrance free oils), usual care, or no treatment.</p> <p>Outcome measures <i>Anxiety:</i> State of anxiety scale (2 RCTs), Hospital anxiety and depression scale (4 RCTs), Edmonton Symptom assessment scale revised (1 RCTs). <i>Depression:</i> Hospital anxiety and depression scale (4 RCTs), Center for epidemiological investigation depression scale (1 RCT). <i>Nausea and vomiting:</i> Visual analog scale (4 RCTs), European Organization for Research and Treatment of Cancer of Quality of Life questionnaire (1 RCT), Edmonton Symptom assessment scale revised (1 RCTs). <i>Sleep quality:</i> Pittsburgh Sleep Quality Index (4 RCTs). <i>Quality of Life:</i> European Organization for Research and Treatment of Cancer of Quality of life questionnaire (1 RCT)</p> <p>Measure of treatment effect SMDs with 95% CI.</p>	<p>Results for outcome measures</p> <p>Sleep quality (7 RCTs) aromatherapy was effective at improving sleep quality (SMD= -0.76; 95%CI, -1.12 to -0.40; P<.0001),</p> <p>Anxiety (13 RCTs) Compared to preintervention and postintervention levels aromatherapy is effective at reducing anxiety levels (SMD=-0.43; 95% CI, -0.69 to -0.17; P=.001). Lavender oil (SMD=-0.43; P =.0001) and massage (SMD=-2.76; P =.04) had a significant effect on reducing anxiety .</p> <p>Depression (5 RCTs) Aromatherapy was found to be effective at improving depressive symptoms in cancer patients (SMD=-0.17; 95% CI, -0.31 to -0.04; P=.01)</p> <p>Fatigue (6 RCTs) Aromatherapy improved fatigue in cancer patients (SMD=-0.23; 95% CI, -0.40 to -0.05; P=.01) Lavender oil was more effective than chamomile oil, citrus oil, tea tree oil, or other mixed essential oils (SMD=-0.70; 95% CI, -0.89 to 0.50; P<.0001).</p> <p>Pain (6 RCTs) Aromatherapy did not have an effect on pain relief in cancer patients (SMD=-0.45; 95% CI, -0.93 to -0.02; P=.06).</p> <p>Quality of Life (4 RCTs) Aromatherapy did not have an effect on quality of life in cancer patients (SMD=-0.33 ; 95% CI, -0.14 to 0.80; P=.16).</p> <p>Nausea and vomiting (7 RCTs) Three RCTs show positive effect of aromatherapy on reducing severity of nausea. The remaining four studies showed no effect. Three studies found aromatherapy reduced the number of vomiting effects after 24 hrs.</p>	<p>Quality assessment of the SR: Low</p> <p>Strengths The authors accessed the heterogeneity of the studies and conducted a subgroup analysis.</p> <p>No conflict of interest was declared in this article.</p> <p>The authors stated no funding was received for this study.</p> <p>The authors published the protocol.</p> <p>Limitations The authors stated that studies were excluded if they provided incomplete results or data that could not be used for meta-analysis. It is unclear if studies that were eligible for the review but not the meta-analysis were excluded.</p>

		<p>Results for risk of bias assessment of primary studies included in review Three studies were assessed as high-risk, three were assessed as low-risk bias, and the remaining twenty were assessed as having some concerns</p> <p>Conclusions: Aromatherapy can improve anxiety, depression, poor sleep quality, fatigue, and vomiting among cancer patients.</p>	
<p>Li F, Jiang T, Shi T. Effect of inhalation aromatherapy on physical and psychological problems in cancer patients: Systematic review and Meta-analysis. J Psychosoc Oncol. 2022 doi: 10.1080/07347332.2021.2011529. (Li 2022a)</p>			
<p>Type of review: Systematic review</p> <p>Search strategy</p> <p>Databases PubMed, Cochrane Library, Embase, Web of Science, CENTRAL, China National Knowledge Infrastructure (CNKI), China Science and Technology Journal Database (VIP), and Wan Fang Data and Chinese Biomedical Medicine Database (CBM).</p> <p>Dates Authors did not provide dates when the search was conducted.</p> <p>Data synthesis Meta-analysis</p> <p>Risk of bias /quality assessment Cochrane Risk of Bias tool</p> <p>Inclusion criteria</p> <p>Population Adults (≥ 18 yrs old, pathological diagnosis of cancer, any type of cancer, treatment, at any stage</p> <p>Interventions or exposures Aromatherapy by direct inhalation of essential oils</p> <p>Excluded Methods that included oils absorbed by the skin</p> <p>Comparators or controls Placebo or routine care.</p>	<p>Studies and participants 16 RCTs and quasi-randomized RCTs, 1272 participants</p> <p>Intervention Inhalation aromatherapy (16 studies)</p> <p>Length of the delivery ranged from 1 day to 4 weeks, the length of the session ranged from 1 min to 9 hrs.</p> <p>Control Placebo (6 studies), control (10 studies)</p> <p>Outcome measures <u>Physical outcomes:</u> sleep disorders (5 studies): RCSQ, PSQI, pain VAS (3 studies), nausea and vomiting (3 studies): MAT, BARF, INVR, RINV</p> <p><u>Psychological outcomes:</u> anxiety (7 studies) and depression (2 studies) (HADS, STAI, SAS).</p> <p>Quality of life (3 studies): FLIE, EORTC QLQ-C30, Quality of life scale.</p> <p>Measure of treatment effect Mean difference (MD) or standardized mean difference (SMD), and count data using relative risk (RR) and 95% CIs.</p>	<p>Results for outcome measures:</p> <p>Pain Inhalation aromatherapy had no effect on pain (SMD -0.30, 95% CI, -0.84, 0.24, P=0.28) and depression (SMD -0.33, 95% CI, -0.66, 0.01, P=0.06).</p> <p>Nausea and vomiting Mixed results, combined result not statistically significant (SMD -0.22, 95% CI, -0.47, 0.04, P=0.09); when analyzed separately, aromatherapy had an effect on nausea (SMD -0.64, 95% CI, -0.96, -0.32, P=0.0001) and vomiting (SMD -0.41, 95% CI, -0.72, -0.09, P=0.01).</p> <p>Sleep disorders Reduction of sleep disorders symptoms (SMD -1.12, 95% CI, -2.06, -0.19, P<.0001)</p> <p>Anxiety Improved anxiety symptoms (SMD -0.70 95% CI, -1.08, -0.31 P<.0001);</p> <p>QoL Improved quality of life (SMD 0.48, 95% CI, 0.26, 0.70 P<.0001).</p> <p>Results for risk of bias assessment of primary studies included in review:</p> <p>For randomization, nine studies had a low risk of bias, four studies had an uncertain risk of bias, and three studies had a high risk of bias.</p> <p>For allocation concealment, ten studies were assessed as low risk bias, eight studies as</p>	<p>Quality assessment of the SR: Low</p> <p>Strengths No conflict of interest was declared in this article.</p> <p>The authors stated no funding was received for this article.</p> <p>The authors published the protocol.</p> <p>Limitations The authors did not register a protocol.</p> <p>Authors did not indicate if the reference lists from primary research studies included in the systematic review were screened.</p> <p>The number of included studies in the MA was low.</p> <p>It is not clear if studies that were eligible for the review but not the meta-analysis were excluded.</p>

<p>Outcome Physical: sleep disorders, pain, nausea, and vomiting. Psychological outcomes: anxiety and depression Quality of life (secondary outcome)</p>		<p>uncertain risk of bias, and two studies as high-risk bias. For detection bias, six studies were assessed as low risk of bias, and ten had uncertain risk of bias. For the remaining analysed bias all the studies were assessed as low risk. Conclusions: The review found inhalation aromatherapy has an effect on sleep, anxiety, and quality of life.</p>	
<p>Farahani MA, Afsargharehbagh R, Marandi F, et al. Effect of aromatherapy on cancer complications: A systematic review. Complement Ther Med. 2019 Dec doi: 10.1016/j.ctim.2019.08.003. (Farahani 2019)</p>			
<p>Type of review: Systematic review Search strategy Databases PubMed, Scopus, Web of Science, EMBASE, and Cochrane CENTRAL and national databases (SID and Magiran). Dates Searched from inception to April 23, 2019 Data synthesis Narrative synthesis Risk of bias /quality assessment Jadad scale, quality of quasi-experimental studies was assessed by JBI quasi-experimental appraisal tool. Inclusion criteria: Population: Cancer patients (authors did not specify age group). No language restrictions. Interventions or exposures All clinical trial studies (with or without control group), quasi-experimental studies that examined the effects of any aroma in the form of inhalation, massage, bath, and drinks. No limitations on aromas used and outcomes. Excluded: Poor quality studies</p>	<p>Studies and participants 31 RCTs and 11 quasi-experimental, one case series. 3239 participants. Intervention Inhalation (n=21), massage (n=22), and other forms (n=3). Inhalation and massage simultaneously (n=3). More than 32 types of aromas, most commonly used aromas included lavender (n=18), chamomile (n=6), and ginger (n=5). Length of the delivery ranged from 2min to 19hrs. In most studies, patients experienced a total of 3 aromatherapy courses. Control Placebo (6 studies), control (10 studies) Outcome measures <u>Anxiety</u> (n = 16): SAI, HANDS, STAI, BAI, VSH Pain (n = 13): VAS, BPI-K, VAA, RTOG, NRPS, EORTC. <u>Quality of life</u> (n = 9): QLI, MQoL, EORTC-QLQ, QoL scale, HADS, POMS. <u>Nausea and Vomiting</u> (n = 9): RINV, PedNAT, VAS, MASCC. <u>Depression</u> (n = 6): SDS, SPHERE, CES-D. <u>Physical and psychological symptoms relief</u> (n = 4): Rotterdam symptoms checklist, POMS. <u>Sleep quality</u> (n = 4): RCSQ, PSQI. <u>Fatigue</u> (n = 4): PFS, CFS, EORTC-QoL. <u>Oral mucositis</u> (n = 2): NCI-CTC, VAS. <u>Skin disorders</u> (n = 2): WHO criteria. <u>Wellbeing</u> (n = 2): MYMOP, MYCaW. <u>Mood</u> (n = 1), <u>Constipation</u> (n = 1): CAS</p>	<p>Results for outcome measures: Anxiety (16 studies): Aromatherapy massage improved anxiety symptoms in 9 studies, did not improve anxiety symptoms in 2 studies, and the most effective anti-anxiety aromas included lavender (n = 8), chamomile (n=3), and bergamot (n=3) Depression (6 studies) Inhalation aromatherapy does not have a significant effect on depression. Aromatherapy massage method reduced depression in cancer patients in all studies. Quality of Life (9 studies): 5/9 significant effect of aromatherapy massage on improving quality of life. No significant effect in 4 studies. Pain (13 RCTs) Inhalation: 5/13 pain relief. Gargle: one study showed a significant effect on pain relief. Three studies showed no significant effect on pain. Nausea and vomiting (9 studies) Inhalation: 7/9 studies showed significant effect, 2 studies no significant effect on nausea and vomiting. Massage: 2 studies showed improved nausea and vomiting symptoms. Sleep quality (4 studies): Inhalation aromatherapy (3 studies) improved</p>	<p>Quality assessment of the SR Low, the lack of quantitative analysis and detailed quality assessment of included studies limits the strength of its conclusions. Strengths There was no language limitations Limitations: No meta-analysis was conducted</p>

	<p>The most commonly used tools were VAS (n = 8) and HADS (n = 5).</p> <p>Measure of treatment effect Not reported</p>	<p>sleep quality after inhalation aromatherapy. Aromatherapy massage (1 study) showed that aromatherapy massage with lavender essential oil improves sleep quality.</p> <p>Fatigue (4 studies) All of the studies showed improvement in fatigue after the aromatherapy.</p> <p>Physical and psychological symptoms (3 studies) All studies showed a significant effect of the aromatherapy on the improvement of physical and psychological symptoms relief.</p> <p>Results for risk of bias assessment of primary studies included in review: Twenty-nine studies were evaluated using the Jadad scale (ranges 0-5). Eighteen studies scored 3, seven scored 4, two scored 2, and two scored 5.</p> <p>Conclusions: Aromatherapy can be used as a proper supplemental treatment to improve complications, although further studies are needed to determine the protocol and the standard dosage.</p>	
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Cochrane Review

Design and methods	Included studies	Main results and conclusions	Comments
Shin ES, Seo KH, Lee SH, et al. Massage with or without aromatherapy for symptom relief in people with cancer. Cochrane Database Syst Rev. 2016 doi: 10.1002/14651858.CD009873.pub3 (Shin 2016)			
<p>Type of review Systematic review (Cochrane)</p> <p>Search strategy</p> <p>Databases Cochrane Central Register of Controlled Trials (CENTRAL, 2015, Issue 7), MEDLINE (Ovid), EMBASE (Ovid), PsycINFO (Ovid), CINAHL (EBSCO), PubMed Cancer Subset, SADCCT, and the World Health Organization (WHO) ICTRP. South Asian Database of Controlled Clinical Trials (SADCCT), Clinical trial registries for ongoing studies, regional databases.</p> <p>Searched from inception to August 2015</p> <p>Data synthesis Meta-analysis</p> <p>Risk of bias /quality assessment Cochrane Risk of Bias tool</p> <p>Inclusion criteria</p> <p>Population Adults and children diagnosed with cancer. Inpatients and outpatients who received care in any healthcare setting (e.g. hospital, hospice, oncology centre, or community).</p> <p>Excluded Inhalations and humidification were excluded. Touch therapies such as therapeutic touch, acupressure, and reflexology were also excluded.</p> <p>Interventions or exposures Massage (using carrier oil only), massage with aromatherapy (using carrier oil plus essential oils), and massage with aromatherapy (using carrier oil plus essential oils).</p> <p>Massage was required to include tissue manipulation using a carrier oil.</p> <p>Aromatherapy was defined as the use of a blended carrier oil with essential oils and will</p>	<p>Studies and participants 19 RCTs and 14 included in qualitative synthesis and 5 in a quantitative synthesis, 1274 participants</p> <p>Intervention 13 RCTS Massage compared to no massage, 6 RCTs massage with aromatherapy compares to no massage and 2 RCTs massage with aromatherapy compared to massage without aromatherapy. (using carrier oil plus essential oils).</p> <p>Control No massage (19 RCTs), and massage without aromatherapy (2 RCTs).</p> <p>Outcome measures:</p> <p><u>Massage vs. No massage</u></p> <p><u>Anxiety (10 RCTs):</u> ESAS:AM (1 RCTs), HAD (2 RCTs), SCL-90-R (1 RCT), STAI (3 RCTs), VAS (3 RCTs),</p> <p><u>Depression (6 RCTs):</u> BDI (1 RCT), ESAS:AM (1 RCT), HAD (2 RCT), PHQ (1 RCT), POMS (1 RCT), SCL-90-R (1 RCT)</p> <p><u>Mood:</u> BSF (1 RCT), VAS (1 RCT)</p> <p><u>Quality of Life:</u> the Graham scale (1 RCT), the McGill scale (1 RCT), RSCL (1 RCT)</p> <p><u>Nausea (2 RCTs):</u> ESAS:AM (1 RCTs), VAS (1 RCTs)</p> <p><u>Pain (6 RCTs):</u> ESAS:AM (1 RCTs), PAT (1 RCTs), PPI-VAS (4 RCTs), SNVR (1 RCTs), VAS (1 RCTs)</p> <p><u>Massage with aromatherapy vs. no massage</u></p> <p><u>Anxiety (4 RCTs):</u> HAD (1 RCTs), STAI (2 RCTs), VAS (1 RCTs)</p> <p><u>Depression (6 RCTs):</u> BDI (1 RCT), HAD (1 RCT), VAS (1 RCT), CES-D (1 RCT)</p> <p><u>Mood:</u> POMS (1 RCT)</p> <p><u>Quality of Life:</u> RSCL (1 RCT), EORTC QLQ (1 RCT). MYMOP (1 RCTs)</p> <p><u>Arm and breast symptoms:</u> EORTC QLQ-BR23 (1 RCT)</p>	<p>Results for outcome measures:</p> <p><u>Massage vs. No massage</u></p> <p>Short-term <u>pain</u> was greater for the massage group compared with the no-massage group (one RCT, n=72, mean difference (MD) -1.60, 95% confidence interval (CI) -2.67 to -0.53). Data for <u>anxiety</u> relief showed no significant difference in anxiety between the groups (three RCTs, n=98, combined MD -5.36, 95% CI -16.06 to 5.34). The subgroup analysis for anxiety revealed that the <u>anxiety relief for children</u> was greater for the massage group compared with the no-massage group (one RCT, n=30, MD -14.70, 95% CI -19.33 to -10.07), but the size of this effect was considered not clinically significant. The review demonstrated no differences in effects of massage on <u>depression, mood disturbance, psychological distress, nausea, fatigue, physical symptom distress, or quality of life</u> when compared with no massage.</p> <p><u>Massage with aromatherapy vs. no massage</u></p> <p>The relief of <u>medium- and long-term pain</u> (medium-term: one RCT, n=86, MD 5.30, 95% CI 1.52 to 9.08; long-term: one RCT, n=86, MD 3.80, 95% CI 0.19 to 7.41), <u>anxiety</u> (two RCTs, n=253, combined MD -4.50, 95% CI -7.70 to -1.30), and long-term <u>symptoms relating to the breast</u> in people with breast cancer (one RCT, n=86, MD -9.80, 95% CI -19.13 to -0.47) was greater for the aromatherapy-massage group, but the results were considered not clinically significant. The <u>medium-term quality of life</u> score was lower for the aromatherapy-massage group compared with the no-massage group (one RCT, n=30, MD -2.00, 95% CI -3.46 to -0.54).</p> <p>Results for <u>pain, anxiety, symptoms relating to the breast, and quality of life</u> were analysed but</p>	<p>Quality assessment of the SR: High, Cochrane review</p> <p>We downgraded the GRADE quality of the evidence for all outcomes to very low because of observed imprecision, indirectness, imbalance between groups in many studies, and limitations of study design.</p> <p>Strengths: No conflict of interest was declared in this article.</p> <p>The authors stated no funding was received for this article.</p> <p>This is a Cochrane review which follows strict guidelines</p>

<p>include only aromatherapy administered with massage.</p> <p>Comparators or controls No massage, and massage without aromatherapy (using carrier oil only).</p> <p>Outcome Pain</p> <p>Psychological symptoms (including anxiety and depression)</p> <p>Secondary outcomes Other physical symptoms (including fatigue and nausea, etc.), quality of life, and adverse events.</p>	<p>Fatigue: EORTC QLQ (1 RCT), VAS (1 RCT)</p> <p>Pain (6 RCTs): EORTC QLQ 1 (RCT), SF-8, SNVR (1 RCT), VAS (3 RCTs)</p> <p>Psychological and physical symptom distress: RSCL (1 RCT)</p> <p>Massage with aromatherapy vs. massage without aromatherapy</p> <p>Anxiety (2 RCTs): HAD (1 RCTs), STAI (1 RCT)</p> <p>Depression: HAD (1 RCT)</p> <p>Quality of Life: RSCL (2 RCT)</p> <p>Pain: VAS (1 RCT)</p> <p>Psychological RSCL (2 RCT) and physical symptom distress: RSCL (1 RCT)</p> <p>Measure of treatment effect Risk ratio (RR), mean difference (MD) or standardized mean difference (SMD), and 95% CIs.</p>	<p>the quality of evidence was very low as studies were generally at a high risk of bias.</p> <p>Massage with aromatherapy vs. massage without aromatherapy</p> <p>The authors were unable to assess the effect of adding aromatherapy to massage on the relief of <u>pain, psychological symptoms including anxiety and depression, physical symptom distress, or quality of life.</u></p> <p>Adverse events</p> <p>Only 2 / 19 trials assessed AEs; which were few, minor and transient (headache, distress, rash).</p> <p>Results for risk of bias assessment of primary studies included in review: GRADE quality of the evidence for all outcomes was downgraded to very low because of observed imprecision, indirectness, imbalance between groups in many studies, and limitations of study design.</p> <p>Three of studies were assessed as high risk of bias due to the inadequate random sequence generation. Six studies were low risk of bias for selection bias. One study had a high risk of bias in allocation concealment, and 14 studies showed an unclear risk of bias in allocation concealment.</p> <p>Fifteen studies had a low risk of bias for blinding of outcome assessment, and four studies showed an unclear risk of bias for this assessment.</p> <p>Seven studies were low risk of attrition bias Ten studies were at unclear risk of attrition bias, and two studies showed a high risk of bias.</p> <p>Eight studies were low risk of bias due to selective reporting. Nine studies were at unclear risk of reporting bias, and the remaining two studies showed a high risk of bias.</p> <p>Eleven studies had fewer than 50 participants in total and were judged as high risk of bias. One study was at low risk of bias with more than 200 participants. The remaining studies were assessed as unclear risk of bias.</p>	
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		<p>Five studies had a high risk of other bias, and five studies had an unclear risk of other bias. The remaining studies had a low risk of other bias.</p> <p>Conclusions: There was a lack of evidence on the clinical effectiveness of massage for symptom relief in people with cancer. Most studies were too small to be reliable, and key outcomes were not reported.</p>	
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Abbreviations

BAI: Beck Anxiety Inventory
 BARF Baxter Retching Faces pictorial scale
 BDI: Beck Depression Inventory
 BSF: Berlin Mood Questionnaire;
 CES-D: Center for Epidemiological Studies Depression
 CI confidence interval
 CINV: Chemotherapy-induced nausea and vomiting
 EORTC QLQ-C30– European Organization of Research and Treatment of Cancer Quality of Life Questionnaire
 EORTC QLQ-BR23: European Organization of Research and Treatment of Cancer Quality of Life Questionnaire Breast Module
 ESAS:AM: Edmonton Symptom Assessment System-Ascites Modification (measurement of pain, anxiety, depression, and nausea)
 FLIE - The Functional Living Index-Emesis
 GBB: Giessen Complaints Inventory (measurement of limb pain)
 HADS: Hospital anxiety depression scale
 HAMD: The Hamilton Depression Rating Scale

INVR: Index of Nausea, Vomiting, and Retching
 KISS: Korean Studies Information Service System
 MA: meta-analysis
 MAT: the Multinational Association of Supportive Care in Cancer Antiemetic Tool
 MYMOP: Measure Yourself Medical Outcome Profile (measurement of quality of life; lower score indicates greater quality of life, 7='as bad as it could be' and 0='as good as it could be');
 NDSL: National Digital Science Library
 nRCT: non-randomized controlled trial
 PAT: Pain Assessment Tool (measurement of pain);
 PHQ: Patient Health Questionnaire (measurement of depression);
 POMS: Brief Profile of Mood States
 PPI-VAS: Present Pain Intensity-Visual Analogue Scale (measurement of pain; lower score indicates less pain, 10='pain as bad as it could be' and 0='no pain');
 PSQI- The Pittsburgh Sleep Quality Index
 QAI: Ostomy adjustment Inventory

RCSQ: The Richards-Campbell Sleep Questionnaire
 RCT: randomized controlled trial
 RINV- the Rhodes Index of Nausea and Vomiting
 RISS: Research Information Sharing Service
 RoB: Cochrane Risk of Bias Tool version 1
 RoB2: Cochrane Risk of Bias Tool version 2
 RR: risk ratio
 RSC: Random symptom checklist
 RSCL: Rotterdam symptoms checklist
 SAI: State Anxiety Inventory
 SAS: Visual analogue scale
 SCL-90-R: Symptom Checklist-90-R (measurement of anxiety and depression);
 SF-8: Short-Form Health Survey-8 (measurement of bodily pain; higher score on bodily pain indicates less pain);
 SMD: standardized mean differences
 SNVR: Skilled Nursing Visit Report form (measurement of pain);
 STAI: State-Trait Anxiety Inventory; low score indicating less severity in anxiety (measurement of anxiety);
 VAS: Visual analog scale