Appendix E1. Characteristics of studies included in the evidence synthesis

Study details	Population	Aromatherapy intervention arm(s)	Comparator arm(s)	Outcomes (* = selected for synthesis)
Abbasijahromi 2020 [101-S] **Country:** Iran **Setting (detail):** hospital - inpatient (NR) **Study design:** parallel group	**No. randomised (age; sex):** 90 adults (AT1. 27 years, AT2. 28, C. 30 [mean]; 100% female) **Treatment goal:** relieve surgery-related side effects (caesarean section) **Inclusion criteria:** Scheduled for caesarean section **Exclusion criteria:** Chronic or cancer pain **ICD code:** JB22.0 Delivery by elective caesarean section	**Name:** AT1 - damask rose (inhalation) AT2 - lavender (inhalation) **What – essential oil & procedure:** AT1. damask rose or AT2. lavender (% and carrier NR), 3 drops applied on cotton balls placed 10 cm away **When & how much:** 1 x 30min **Who administered (provider; AT training):** provider administered (NR; NR) **Co-intervention(s):** n/a	**Name:** inactive - placebo **What – materials & procedure:** distilled water, 3 drops applied on cotton balls placed 10 cm away **When & how much:** 1 x 30min **Who administered (provider):** provider administered **No. arms included in synthesis (treatment & control):** 3 **Ineligible arms:** none	**Eligible outcomes:** Pain: postoperative pain intensity (VAS)* Emotional functioning / mental health: postoperative anxiety (STAI - overall, state* and trait subscales) **Ineligible outcomes:** n/a **Timing of outcome measurement:** 5 min after AT intervention (time post-surgery NR)*
Abbaszadeh 2018 [349-S] **Country:** Iran **Setting (detail):** hospital - outpatient (NR) **Study design:** parallel group	**No. randomised (age; sex):** 80 adults (AT. 40 years, C. 43 [mean]; AT. 45% female, C. 53%) **Treatment goal:** relieve procedure-related side effects (bone marrow biopsy) **Inclusion criteria:** Confirmed diagnosis of leukemia or solid cell carcinoma; Scheduled for bone marrow biopsy **Exclusion criteria:** Analgesia up to 8 hours before procedure **ICD code:** 02 Neoplasms (bone marrow biopsy)	**Name:** AT - lavender (inhalation) **What – essential oil & procedure:** lavender (10%, carrier: NR) administered on a cotton ball placed inside a container and inhaled at distance of 7-10 cm **When & how much:** 3 drops for 15 minutes before the procedure **Who administered (provider; AT training):** provider administered (NR; NR) **Co-intervention(s):** n/a	**Name:** inactive - placebo **What – materials & procedure:** distilled water administered on a cotton ball placed inside a container and inhaled at distance of 7-10 cm **When & how much:** 3 drops for 15 mins before procedure **Who administered (provider):** provider administered **No. arms included in synthesis (treatment & control):** 2 **Ineligible arms:** none	**Eligible outcomes:** Pain: periprocedural pain intensity (VAS)* [Abbaszadeh 2018] Emotional functioning/mental health: postprocedural anxiety - immediate (VAS)* [Abbaszadeh 2020] **Ineligible outcomes:** n/a **Timing of outcome measurement:** after procedure*
Abdollahi 2020 [093-S] **Country:** Iran **Setting (detail):** hospital - inpatient (Hospitals) **Study design:** parallel group	**No. randomised (age; sex):** 60 adults (AT. 58 years, C. 59 [mean]; AT. 53% female, C. 73%) **Treatment goal:** relieve symptoms of a condition (type 2 diabetes) **Inclusion criteria:** Diagnosed with type 2 diabetes; Self-reported anxiety and fatigue **Exclusion criteria:** History of psychiatric disorders; use of anxiolytics or hypnotics	**Name:** AT - bitter orange (inhalation) **What – essential oil & procedure:** bitter orange (20%, carrier n/a), administered on a cotton ball and attached to collar **When & how much:** 8 drops nightly, from 10 pm to 6 am, for 3 days	**Name:** inactive - usual care **What – materials & procedure:** usual care not described **When & how much:** n/a **Who administered (provider):** n/a **No. arms included in synthesis (treatment & control):** 2 **Ineligible arms:** none	**Eligible outcomes:** Emotional functioning/mental health: mental distress - anxiety (VAS)* **Ineligible outcomes:** Fatigue: severity of fatigue (VAS) **Timing of outcome measurement:** morning after 3-night AT intervention*

Study details	Population	Aromatherapy intervention arm(s)	Comparator arm(s)	Outcomes (* = selected for synthesis)
	ICD code: 5A11 Type 2 diabetes mellitus; self-reported anxiety and fatigue	**Who administered (provider; AT training):** provider administered (NR; NR) **Co-intervention(s):** n/a		
Abo-S-haghi 2021 [111-S] **Country:** Iran **Setting (detail):** hospital - outpatient (Haemodialysis units) **Study design:** parallel group	**No. randomised (age; sex):** 57 adults (49 years [mean]; 47% female) **Treatment goal:** relieve procedure-related side effects (haemodialysis) **Inclusion criteria:** Chronic kidney failure,; ⩾1 year of haemodialysis **Exclusion criteria:** Diabetic neuropathy; pain relief medicines & therapies; skeletal or neuromuscular disorders; arthritis **ICD code:** QB94 Care involving dialysis	**Name:** AT - lavender (massage) **What – essential oil & procedure:** lavender (1/5%, carrier NR), 10 drops administered by lower leg massage as per protocol **When & how much:** 3 x 5-min massage 2-3 times per week over 4 weeks **Who administered (provider; AT training):** provider administered (nurse clinically qualified; NR) **Co-intervention(s):** n/a	**Name:** inactive control - massage (co-intervention) **What – materials & procedure:** olive oil (undiluted, carrier n/a), 10 drops administered by lower leg massage as per protocol **When & how much:** 3 x 5-min massage 2-3 times per week, over 4 weeks **Who administered (provider):** provider administered **No. arms included in synthesis (treatment & control):** 2 **Ineligible arms:** none	**Eligible outcomes:** Pain: periprocedural pain intensity (VAS)* **Ineligible outcomes:** n/a **Timing of outcome measurement:** end of week 1, 2, 3 and 4* (end of intervention period)
Adachi 2014 [172-S] **Country:** Japan **Setting (detail):** hospital - inpatient (Ophthalmology ward) **Study design:** parallel group	**No. randomised (age; sex):** 63 adults (AT. 62 years, C1. 66, C2. 63 [mean]; AT. 55% female, C1. 65%, C2. 30%) **Treatment goal:** relieve surgery-related side effects (vitrectomy) **Inclusion criteria:** Post-vitrectomy; Required to lie face down after surgery **Exclusion criteria:** Pre-existing acute or chronic MSK pain **ICD code:** Vitrectomy; proning (face down posture)	**Name:** AT - lemon eucalyptus (massage) **What – essential oil & procedure:** lemon eucalyptus (undiluted, carrier: grapeseed oil) administered by massage to back, shoulders, waist, arms and neck according to a protocol **When & how much:** 10-min massage with 2 drops oil in 10 mL of carrier oil on morning of day 1 and 2 post-surgery **Who administered (provider; AT training):** provider administered (nurse clinically qualified; AT training) **Co-intervention(s):** n/a	**Name:** C1 inactive control - massage (co-intervention) C2 inactive - no intervention **What – materials & procedure:** C1-grapeseed oil administered by massage to back, shoulders, waist, arms and neck according to a protocol C2-All participants in the study received usual care, incl. use of assistive devices such as pillows, desks, and beds, and rescue medication (e.g. anti-inflammatory cream or poultices) as needed **When & how much:** C1-10-min massage on morning of day 1 and 2 post-surgery C2- n/a **Who administered (provider):** C1-provider administered C2-provider administered	**Eligible outcomes:** Pain: postoperative pain intensity - late acute (faces rating scale; 5 regions: shoulder*, back, waist, neck, arms) **Ineligible outcomes:** n/a **Timing of outcome measurement:** days 1 and 2* postoperative (immediately prior to and about 1.5 hours after each AT session), day 3 (24 hours after last AT session)

Study details	Population	Aromatherapy intervention arm(s)	Comparator arm(s)	Outcomes (* = selected for synthesis)
			No. arms included in synthesis (treatment & control): 3 **Ineligible arms:** none	
Adib-Hajbaghery 2015 [171-S] **Country:** Iran **Setting (detail):** hospital - inpatient (Recovery unit) **Study design:** parallel group	**No. randomised (age; sex):** 120 adults (AT. 44 years, C. 43 [mean], AT. 33% female, C. 33%) **Treatment goal:** relieve surgery-related side effects (nephrectomy) **Inclusion criteria:** Scheduled for nephrectomy **Exclusion criteria:** Receiving chemotherapy or antiemetics before surgery **ICD code:** Nephrectomy	**Name:** AT - ginger (inhalation) **What – essential oil & procedure:** ginger (% and carrier NR), 2 drops applied to a 5 x 5 cm gauze, attached to collar **When & how much:** every 30 mins for 2 hrs after transfer into recovery **Who administered (provider; AT training):** provider administered (NR; NR) **Co-intervention(s):** n/a	**Name:** inactive - placebo **What – materials & procedure:** normal saline, 2 drops applied to a 5 x 5 cm gauze, attached to collar **When & how much:** every 30 mins for 2 hrs after transfer into recovery **Who administered (provider):** provider administered **No. arms included in synthesis (treatment & control):** 2 **Ineligible arms:** none	**Eligible outcomes:** Nausea & vomiting: early postoperative nausea severity (VAS), early postoperative vomiting (episodes, within 2hrs* and 6hrs) **Ineligible outcomes:** n/a **Timing of outcome measurement:** 2 hrs post-surgery (in recovery room)*, 6 hrs post-surgery (in ward)
Ahmadi 2020 [170-S] **Country:** Iran **Setting (detail):** hospital - inpatient (Surgical ward) **Study design:** parallel group	**No. randomised (age; sex):** 120 participants (46 years [mean]; AT1. 60% female, AT2. 38%, C. 55%) **Treatment goal:** prevent surgery-related side effects (abdominal surgery) **Inclusion criteria:** Scheduled for abdominal surgery; Postoperative nausea (NVAS score of 20); **Exclusion criteria:** Consumption of antinausea or vomiting medications Consumption of narcotics 4 hours prior to intervention **ICD code:** Abdominal surgery	**Name:** AT1 - peppermint (inhalation, 10%) AT2 - peppermint (inhalation, 30%) **What – essential oil & procedure:** AT1. peppermint (10%) or AT2. peppermint (30%) in distilled water, administered on a 4 x 4 cm gauze inhaled from distance of 10 cm **When & how much:** 2 mL inhaled once for 5 mins (time period post-surgery NR) **Who administered (provider; AT training):** provider administered (research staff; NR) **Co-intervention(s):** n/a	**Name:** inactive - placebo **What – materials & procedure:** distilled water with green food colouring administered on a 4 x 4 cm gauze and inhaled at distance of 10 cm **When & how much:** 2 mL inhaled once for 5 mins (time period post-surgery NR) **Who administered (provider):** provider administered **No. arms included in synthesis (treatment & control):** 3 **Ineligible arms:** none	**Eligible outcomes:** Nausea & vomiting: postoperative nausea severity (time period NR) (VAS)* **Ineligible outcomes:** n/a **Timing of outcome measurement:** immediately after AT intervention*
Ahmadifard 2020 [103-S] **Country:** Iran **Setting (detail):** community based (Home)	**No. randomised (age; sex):** 144 adults (34 years [median]; 27% female) **Treatment goal:** relieve symptoms of a condition (migraine)	**Name:** AT1 - basil (topical, 2%) AT2 - basil (topical, 4%) AT3 - basil (topical, 6%) **What – essential oil & procedure:** AT1. basil (2%) or AT2. basil (4%) or AT3. basil (6%) administered	**Name:** inactive - placebo **What – materials & procedure:** placebo with same appearance and odour as basil essential oil (materials NR) administered topically to the frontal and temporal areas	**Eligible outcomes:** Pain: migraine pain intensity (VAS, categorised as 'mild', 'moderate', 'severe')*, migraine attack frequency **Ineligible outcomes:** n/a

Study details	Population	Aromatherapy intervention arm(s)	Comparator arm(s)	Outcomes (* = selected for synthesis)
Study design: parallel group	**Inclusion criteria:** Migraine (IHS criteria) > 1 year with more than 2 attacks per month **Exclusion criteria:** Use of other medications **ICD code:** 8A80.Z Migraine, unspecified	topically to the frontal and temporal areas **When & how much:** applied every 8 hrs for 3 mths (amount NR) **Who administered (provider; AT training):** self-administered, provider prescribed (NR; n/a) **Co-intervention(s):** n/a	**When & how much:** applied every 8 hrs for 3 mths (amount NR) **Who administered (provider):** self-administered, provider prescribed **No. arms included in synthesis (treatment & control):** 4 **Ineligible arms:** none	**Timing of outcome measurement:** week 2, 4, 8 and 12 (end of AT intervention period)*
Ahmady 2019 [071-S] **Country:** Iran **Setting (detail):** hospital - outpatient, community based (Haemodialysis unit; home) **Study design:** parallel group	**No. randomised (age; sex):** 90 adults (55 years [mean]; 41% female) **Treatment goal:** relieve treatment-related side effects (haemodialysis) **Inclusion criteria:** Haemodialysis weekly; Fatigue (> 36 on the Fatigue Severity Scale); History of haemodialysis for at least 6 months **Exclusion criteria:** Candidate for kidney transplantation; absent for more than three consecutive sessions at the time of intervention **ICD code:** QB94 Care involving dialysis; MG22 Fatigue	**Name:** AT1 - lavender (inhalation) AT2 - orange (inhalation) **What – essential oil & procedure:** AT1. lavender or AT2. orange (undiluted, carrier n/a) administered on cotton ball attached to collar **When & how much:** participants wore cotton ball with 5 drops of oil for 30 mins, 3 days per week for 2 weeks (6 sessions) during first 30 mins of dialysis in hospital, then 4 days per week for 2 weeks (8 sessions) 30 mins prior to bedtime at home, total 14 sessions **Who administered (provider; AT training):** provider administered (NR; NR) **Co-intervention(s):** n/a	**Name:** inactive - placebo **What – materials & procedure:** distilled water administered on a cotton ball attached to collar **When & how much:** participants wore cotton ball with 5 drops of distilled water for 30 mins, 3 days per week for 2 weeks (6 sessions) during first 30 mins of dialysis in hospital, then 4 days per week for 2 weeks (8 sessions) 30 mins prior to bedtime at home, total 14 sessions **Who administered (provider):** provider administered **No. arms included in synthesis (treatment & control):** 3 **Ineligible arms:** none	**Eligible outcomes:** Fatigue: fatigue severity overall (FSS)* **Ineligible outcomes:** n/a **Timing of outcome measurement:** end of week 2 (end of AT intervention period)*
Akbari 2019 [072-S] **Country:** Iran **Setting (detail):** hospital - inpatient (Hospitalised cardiac patients) **Study design:** parallel group	**No. randomised (age; sex):** 80 adults (55 years [mean]; 40% female) **Treatment goal:** relieve procedure-related side effects (intravenous catheterisation) **Inclusion criteria:** Cardiac patients scheduled for intravenous catheterisation **Exclusion criteria:** Use of sedatives and analgesics in the past 6 hours **ICD code:**	**Name:** AT - peppermint (inhalation) **What – essential oil & procedure:** peppermint (100%, carrier n/a) administered on cotton patch attached to collar area **When & how much:** participants wore patch with 3 drops of oil once for 5 mins before procedure	**Name:** inactive - placebo **What – materials & procedure:** distilled water administered on cotton patch attached to collar area **When & how much:** participants wore patch with 3 drops of distilled water once for 5 mins before procedure **Who administered (provider):** provider administered	**Eligible outcomes:** Pain: postprocedural pain intensity - early acute (NPRS)* Emotional functioning/mental health: postprocedural anxiety - immediate (VAS-A)* **Ineligible outcomes:** n/a **Timing of outcome measurement:** immediate post-procedure*

Study details	Population	Aromatherapy intervention arm(s)	Comparator arm(s)	Outcomes (* = selected for synthesis)
	Cardiac patients (intravenous catheterisation)	**Who administered (provider; AT training):** provider administered (NR; NR) **Co-intervention(s):** n/a	**No. arms included in synthesis (treatment & control):** 2 **Ineligible arms:** none	
Akcan 2016 [332-S] **Country:** Turkey **Setting (detail):** hospital - inpatient (Hospital Obstetric and Pediatric Department) **Study design:** parallel group	**No. randomised (age; sex):** 52 newborns (AT. 48% female, C. 60%) **Treatment goal:** relieve procedure-related side effects (heel prick test) **Inclusion criteria:** Newborns (38-42 weeks gestation, >2500 g); Delivered by caesarean section **Exclusion criteria:** Previous pharmacological or non-pharmacological treatments **ICD code:** Heel prick test (PKU screening)	**Name:** AT - lavender (inhalation) **What – essential oil & procedure:** lavender (% NR, carrier: distilled water) administered in 20 mL sample tube held 10 cm away from nose **When & how much:** one drop in 5 mL distilled water inhaled from 5 mins before procedure until 5 mins after **Who administered (provider; AT training):** provider administered (nurse clinically qualified; NR) **Co-intervention(s):** n/a	**Name:** inactive - placebo **What – materials & procedure:** distilled water in 20 mL sample tube held 10 cm away from nose **When & how much:** 5 mL distilled water inhaled from 5 mins before procedure until 5 mins after **Who administered (provider):** provider administered **No. arms included in synthesis (treatment & control):** 2 **Ineligible arms:** breast milk; amniotic fluid	**Eligible outcomes:** Pain: periprocedural pain intensity (NIPS)* **Ineligible outcomes:** Physiological function, signs and symptoms: HR, SpO2 **Timing of outcome measurement:** immediate post-procedure*
Alavi 2017 [169-S] **Country:** Iran **Setting (detail):** hospital - inpatient (Labour ward) **Study design:** parallel group	**No. randomised (age; sex):** 120 adults (Age NR; 100% female) **Treatment goal:** relieve symptoms of a condition (labour, first stage) **Inclusion criteria:** Pregnant women in active phase labour; Singleton pregnancy with cephalic presentation; **Exclusion criteria:** n/a **ICD code:** Labour, first stage	**Name:** AT1 - jasmine (massage) AT2 - jasmine (inhalation) **What – essential oil & procedure:** AT1-jasmine (dilution and carrier NR) administered by back and shoulder massage AT2-jasmine (dilution and carrier NR) administered on a towel and inhaled **When & how much:** AT1-20-min massage during and after the first contraction in each of three stages (dilation 4 -5 cm, 6 - 7 cm, 8 - 10 cm) AT2-5 - 10 drops of oil inhaled during and after contractions for the duration of labour **Who administered (provider; AT training):** provider administered (research staff; NR)	**Name:** inactive - no intervention **What – materials & procedure:** n/a **When & how much:** n/a **Who administered (provider):** n/a **No. arms included in synthesis (treatment & control):** 3 **Ineligible arms:** none	**Eligible outcomes:** Pain: pain intensity (VAS*, McGill pain ruler) Emotional functioning/mental health: anxiety during labour (STAI* - total, trait or state NR) **Ineligible outcomes:** 'Other' pregnancy, puerperium and perinatal outcomes: duration of labour **Timing of outcome measurement:** unclear in relation to timing of outcome measurement and AT intervention; possibly at each stage of cervical dilation during first stage of labour (4 - 5 cm; 6 -7 cm; 8 - 10 cm)

Study details	Population	Aromatherapy intervention arm(s)	Comparator arm(s)	Outcomes (* = selected for synthesis)
		Co-intervention(s): n/a		
Amini 2020 [105-S] **Country:** Iran **Setting (detail):** hospital - inpatient (surgical ward) **Study design:** parallel group	**No. randomised (age; sex):** 60 adults (AT. 43 years, C. 44 [mean]; AT. 13% female, C. 10%) **Treatment goal:** relieve symptoms of a condition (inguinal hernia) **Inclusion criteria:** Scheduled for inguinal hernia surgery; No analgesic or anxiolytic medications; **Exclusion criteria:** Moderate-severe anxiety; post-surgical complications **ICD code:** DD51 Inguinal hernia (surgery)	**Name:** AT - rose (inhalation) **What – essential oil & procedure:** rose (40%, carrier (NR) administered on cotton ball attached to collar area or pillow **When & how much:** 5 drops of oil inhaled for 20 mins; 3 times after surgery (4h, 8h, 12h) **Who administered (provider; AT training):** provider administered (research staff; NR) **Co-intervention(s):** n/a	**Name:** inactive - placebo **What – materials & procedure:** almond oil (100%) poured on a cotton ball and attached to a patient's collar or pillow **When & how much:** 5 drops of oil inhaled for 20 mins; 3 times after surgery (4h, 8h, 12h) **Who administered (provider):** provider administered **No. arms included in synthesis (treatment & control):** 2 **Ineligible arms:** none	**Eligible outcomes:** Pain: postoperative pain intensity - acute [12 hrs] (VAS)* **Ineligible outcomes:** n/a **Timing of outcome measurement:** 4, 8 and 12 hrs* post-surgery
Amirhosseini 2020 [106-S] **Country:** Iran **Setting (detail):** hospital - inpatient (Urological department) **Study design:** parallel group	**No. randomised (age; sex):** 100 adults (AT1. 43 years, AT2. 42, C. 43 [mean]; AT1. 31% female, AT2. 37%, C. 35%) **Treatment goal:** relieve surgery-related side effects (percutaneous nephrolithotomy) **Inclusion criteria:** Scheduled for percutaneous nephrolithotomy **Exclusion criteria:** No use of sedatives or aromatherapy in past week **ICD code:** GB70.0 Calculus of kidney (percutaneous nephrolithotomy)	**Name:** AT1 - clary sage (inhalation) AT2 - lavender (inhalation) **What – essential oil & procedure:** AT1. clary sage or AT2. lavender (undiluted carrier n/a) administered on sterilized gauze within 10 cm of the nose **When & how much:** 3 drops on gauze inhaled for 5 minutes immediately on waking post surgery, 3 hours, and 6 hours post-surgery **Who administered (provider; AT training):** provider administered (research staff; NR) **Co-intervention(s):** n/a	**Name:** inactive - usual care **What – materials & procedure:** Participants were provided with an oxygen mask and were treated with medication in the event of pain, nausea or vomiting. **When & how much:** n/a **Who administered (provider):** provider administered **No. arms included in synthesis (treatment & control):** 3 **Ineligible arms:** none	**Eligible outcomes:** Pain: postoperative pain intensity - early acute (VAS)*; use of rescue analgesia (any up to 6 hrs) Nausea & vomiting: any early postoperative vomiting (proportion with at least one episode in first 6 hours)*, early postoperative nausea intensity (VAS); use of rescue antiemetics / antinausea drugs (any up to 6 hrs) **Ineligible outcomes:** n/a **Timing of outcome measurement:** 30 minutes after each AT administration (immediate postoperative on waking, 3 and 6* hrs postoperative)
Amzajerdi 2019 [331-S] **Country:** Iran	**No. randomised (age; sex):** 66 adults (AT. 27 years, C. 28 [mean]; 100% female) **Treatment goal:** relieve symptoms of a condition (N&V in pregnancy)	**Name:** AT - peppermint (inhalation) **What – essential oil & procedure:** peppermint (10%, carrier: sesame oil) administered on a piece of cotton and inhaled from 20 cm	**Name:** inactive - placebo **What – materials & procedure:** sesame oil administered on a piece of cotton and inhaled from 20 cm	**Eligible outcomes:** Nausea & vomiting: nausea and vomiting symptom severity (INVR - overall symptom score*; proportion with no, mild, moderate, severe symptoms)

Study details	Population	Aromatherapy intervention arm(s)	Comparator arm(s)	Outcomes (* = selected for synthesis)
Setting (detail): community based (Prenatal care unit; home) **Study design:** parallel group	**Inclusion criteria:** Women 6 - 16 weeks pregnant reporting mild-moderate nausea/vomiting (on Rhodes index); STAI score < 60 **Exclusion criteria:** Mental and emotional disorders; use of anti-emetic or emetic drugs in past 24 hours; use of sedative drugs **ICD code:** Nausea and vomiting in pregnancy (NVP)	**When & how much:** 4 drops for 20 mins, twice a day for 7 days (14 sessions) **Who administered (provider; AT training):** self-administered, provider prescribed (n/a; n/a) **Co-intervention(s):** n/a	**When & how much:** 4 drops for 20 mins, twice a day for 7 days (14 sessions) **Who administered (provider):** self-administered, provider prescribed **No. arms included in synthesis (treatment & control):** 2 **Ineligible arms:** none	**Ineligible outcomes:** Emotional functioning/mental health: anxiety (STAI - state) **Timing of outcome measurement:** days 1 - 7 of the AT intervention period (only 'after intervention'* scores reported; unclear if day 7 score, or average of days 1 - 7 scores)
Anderson 2004 [168-S] **Country:** USA **Setting (detail):** hospital - inpatient (PACU) **Study design:** parallel group	**No. randomised (age; sex):** 22 adults (AT. 42 years, C. 44 [mean]; AT. 60% female, C. 67%) **Treatment goal:** relieve surgery-related side effects (surgery, not specified) **Inclusion criteria:** Scheduled for surgery with anaesthesia; Postoperative nausea **Exclusion criteria:** **ICD code:** MD90 Nausea or vomiting (postoperative)	**Name:** AT - peppermint (inhalation) **What – essential oil & procedure:** peppermint (9% v/v in isotonic saline) applied on 2' x 2' gauze pads, held directly under nostril **When & how much:** 3 slow, deep breaths at first episode of postoperative nausea **Who administered (provider; AT training):** provider administered (nurse clinically qualified; AT training) **Co-intervention(s):** n/a	**Name:** inactive - placebo **What – materials & procedure:** isotonic saline applied on 2' x 2' gauze pads, held directly under nostril **When & how much:** 3 slow, deep breaths at first episode of postoperative nausea **Who administered (provider):** provider administered **No. arms included in synthesis (treatment & control):** 2 **Ineligible arms:** isopropyl alcohol	**Eligible outcomes:** Nausea & vomiting: early postoperative nausea severity (VAS)* **Ineligible outcomes:** n/a **Timing of outcome measurement:** 2* and 5 mins after AT intervention and while in PACU
Arabfirouzjaei 2019 [097-S] **Country:** Iran **Setting (detail):** hospital - inpatient (Cardiac care unit) **Study design:** parallel group	**No. randomised (age; sex):** 80 adults (72 years [mean]; 63% female) **Treatment goal:** relieve treatment-related side effects (CVD inpatient stress) **Inclusion criteria:** Heart failure (stage 3 - 4); Hospitalised for $\geqslant$ 24 hours with sustained vital signs **Exclusion criteria:** Mental illnesses; use of neurological drugs, hypnotics, sedatives, herbal remedies for sleep **ICD code:** BD1Z Heart failure, unspecified (stages 3 and 4)	**Name:** AT - bitter orange (inhalation) **What – essential oil & procedure:** bitter orange (10%, carrier: n/a), administered on cotton ball and inhaled 10 cm from nose **When & how much:** 2 drops for 20 minutes before sleep for 3 nights **Who administered (provider; AT training):** provider administered (NR; NR) **Co-intervention(s):** n/a	**Name:** inactive - usual care **What – materials & procedure:** routine care not described **When & how much:** n/a **Who administered (provider):** n/a **No. arms included in synthesis (treatment & control):** 2 **Ineligible arms:** none	**Eligible outcomes:** Sleep: sleep quality overall*, 13 sub-questions about previous night's sleep (SMHSQ-14) **Ineligible outcomes:** n/a **Timing of outcome measurement:** day 4 (morning after 3-day AT intervention)*

Study details	Population	Aromatherapy intervention arm(s)	Comparator arm(s)	Outcomes (* = selected for synthesis)
Ardahan Akgül 2021 [123-S] **Country:** Turkey **Setting (detail):** hospital - inpatient (NR) **Study design:** parallel group	**No. randomised (age; sex):** 108 children (AT1. 35 months, AT2. 38, C. 39 [mean]; sex NR) **Treatment goal:** relieve procedure-related side effects (dressing change, burns <18yrs) **Inclusion criteria:** Second-degree superficial, scalding burn (total burn surface area <15%) **Exclusion criteria:** Requiring surgery to treat burns; epithelialization **ICD code:** Dressing change (paediatric patients with burns)	**Name:** AT1 - lavender (inhalation, 15 mins) AT2 - lavender (inhalation, 60 mins) **What – essential oil & procedure:** AT1. lavender (15 mins) or AT2. lavender (60 mins) (% and carrier NR) administered on a 7.5 x 7.5 cm gauze and inhaled from 20 cm **When & how much:** 0.5 mL for 15 mins (AT1) or 60 mins (AT2), once between hydrotherapy treatment and dressing change **Who administered (provider; AT training):** provider administered (nurse clinically qualified; NR) **Co-intervention(s):** n/a	**Name:** inactive - placebo **What – materials & procedure:** Jojoba oil (% and carrier NR) administered on a 7.5 x 7.5 cm gauze inhaled from 20 cm **When & how much:** 0.5 mL for 15 mins, once between hydrotherapy treatment and dressing change **Who administered (provider):** provider administered **No. arms included in synthesis (treatment & control):** 3 **Ineligible arms:** none	**Eligible outcomes:** Pain: periprocedural pain intensity (FLACC)* **Ineligible outcomes:** Physiological function, signs and symptoms: RR, HR, BP, body temperature **Timing of outcome measurement:** 1* and 30 mins after wound dressing
Arslan 2020 [121-S] **Country:** Turkey **Setting (detail):** day surgery (Paediatric dentistry department) **Study design:** parallel group	**No. randomised (age; sex):** 126 children (AT. 21% = 6 - 7 years, 41% = 8 - 9, 38% = 10 - 12 C. 19% = 6 - 7 years, 41% = 8 - 9, 40% = 10 - 12; AT. 48% female, C. 52%) **Treatment goal:** relieve procedure-related side effects (dental Tx <18yrs) **Inclusion criteria:** Scheduled for molar tooth extraction **Exclusion criteria:** Dental pain **ICD code:** Dental treatment (children)	**Name:** AT - lavender (inhalation) **What – essential oil & procedure:** lavender (undiluted, carrier n/a) administered on a 'med patch' **When & how much:** 2 drops inhaled for 3 minutes prior to procedure **Who administered (provider; AT training):** NR (NR; NR) **Co-intervention(s):** n/a	**Name:** inactive - no intervention **What – materials & procedure:** n/a **When & how much:** n/a **Who administered (provider):** n/a **No. arms included in synthesis (treatment & control):** 2 **Ineligible arms:** none	**Eligible outcomes:** Pain: postprocedural pain intensity - early acute (Wong-Baker FACES Pain Rating Scale (FACES))*; observer-rated pain (Face, Legs, Activity, Cry, Consolability scale); Emotional functioning/mental health: preprocedural anxiety (face image scale)** **Ineligible outcomes:** Behaviour: cooperativeness with procedure (Frankel Behaviour observer rating scale); Physiological function, signs and symptoms: SBP, DBP, HR, RR. **Timing of outcome measurement:** peri-procedural (after anaesthesia**); immediate post-procedural (after tooth extraction*)
Asgari 2020 [073-S] **Country:** Iran	**No. randomised (age; sex):** 51 adults (AT. 60 years, C1. 60, C2. 58 [mean]; 0% female) **Treatment goal:** relieve treatment-related side effects (CVD inpatient stress)	**Name:** AT - bitter orange (inhalation) **What – essential oil & procedure:** bitter orange (10%, carrier NR) administered on cotton ball held	**Name:** C1 inactive - placebo C2 inactive - usual care **What – materials & procedure:** C1-sunflower oil administered on cotton ball	**Eligible outcomes:** Sleep: sleep quality (VAS)* **Ineligible outcomes:** n/a

Study details	Population	Aromatherapy intervention arm(s)	Comparator arm(s)	Outcomes (* = selected for synthesis)
Setting (detail): hospital - inpatient (Cardiac care unit (CCU)) **Study design:** parallel group	**Inclusion criteria:** Pectoris angina or myocardial infarction; Scheduled for percutaneous coronary interventions (PCIs) **Exclusion criteria:** Medication as reported by a specialist (type of medication NR); use of herbal medicines over the previous two weeks; previous PCIs; BMI >30 kg/m2 **ICD code:** BA40 Angina pectoris; BA41 Acute myocardial infarction (hospitalised prior to percutaneous coronary intervention)	under nose for 2 - 3 breaths then pinned to collar **When & how much:** 2 drops of oil inhaled overnight (10 pm to 8 am) prior to day of procedure **Who administered (provider; AT training):** provider administered (NR; NR) **Co-intervention(s):** n/a	held under nose for 2 - 3 breaths then pinned to collar C2-routine care with no additional interventions **When & how much:** C1-2 drops of oil inhaled overnight (10 pm to 8 am) prior to day of procedure C2-n/a **Who administered (provider):** C1-provider administered C2-n/a **No. arms included in synthesis (treatment & control):** 3 **Ineligible arms:** acupressure; false point accupressure	**Timing of outcome measurement:** morning after overnight AT intervention*
Ayan 2013 [167-S] **Country:** Turkey **Setting (detail):** hospital - emergency (Emergency department) **Study design:** parallel group	**No. randomised (age; sex):** 80 adults (AT. 37 years, C. 36 [mean]; AT. 50% female, C. 53%) **Treatment goal:** relieve symptoms of a condition (renal colic) **Inclusion criteria:** Diagnosed with renal colic; Presence of kidney stones; **Exclusion criteria:** Use of NSAIDs in past 24 hours, renal dysfunction **ICD code:** MF56 Renal colic	**Name:** AT - rose (inhalation) **What – essential oil & procedure:** rose (2% dilution in water) administered by vapouriser in treatment room in addition to 75 mg intramuscular diclofenac **When & how much:** 2 drops of oil, duration NR **Who administered (provider; AT training):** provider administered (NR; NR) **Co-intervention(s):** n/a	**Name:** inactive - placebo **What – materials & procedure:** physiological serum via an electronic vapourizer in treatment room in addition to 75 mg intramuscular diclofenac **When & how much:** placebo during treatment, amount NR **Who administered (provider):** NR **No. arms included in synthesis (treatment & control):** 2 **Ineligible arms:** none	**Eligible outcomes:** Pain: pain intensity (VAS)* **Ineligible outcomes:** Physiological function, signs and symptoms: MAP, HR **Timing of outcome measurement:** 10 and 30* mins after intervention begin
Ayik 2018 [166-S] **Country:** Turkey **Setting (detail):** hospital - inpatient (General surgery unit) **Study design:** parallel group	**No. randomised (age; sex):** 96 adults (AT. 61 years [mean], C. 60; AT. 40% female, C. 50%) **Treatment goal:** relieve surgery-related side effects (colorectal surgery) **Inclusion criteria:** Scheduled for colorectal surgery **Exclusion criteria:** Cognitive impairment; mental disorders; use of antidepressants,	**Name:** AT - lavender (massage) **What – essential oil & procedure:** lavender (5% in sweet almond oil) administered by back massage according to a protocol **When & how much:** 2 x 10-minute massages (1 x evening before surgery, 1 x morning of surgery)	**Name:** inactive - usual care **What – materials & procedure:** standard nursing care in compliance with the hospital procedure applied in the preoperative period **When & how much:** n/a **Who administered (provider):** n/a	**Eligible outcomes:** Sleep: sleep quality overall (RCSQ - total)*, deep/light sleep, sleep latency, awakenings, ease of return to sleep, quality of sleep (RCSQ subdomains) Emotional functioning/mental health: preoperative anxiety (STAI - state)* **Ineligible outcomes:** n/a

Study details	Population	Aromatherapy intervention arm(s)	Comparator arm(s)	Outcomes (* = selected for synthesis)
	hypnotics, benzodiazepines or narcotic derivatives **ICD code:** Colorectal surgery	**Who administered (provider; AT training):** provider administered (research staff; NR) **Co-intervention(s):** n/a	**No. arms included in synthesis (treatment & control):** 2 **Ineligible arms:** none	**Timing of outcome measurement:** morning before surgery (immediately after final AT intervention)*
Azima 2015 [077-S] **Country:** Iran **Setting (detail):** community based (University dormitories) **Study design:** parallel group	**No. randomised (age; sex):** 76 adults (AT. 21 years, C. 21 [mean]; 100% female) **Treatment goal:** relieve symptoms of a condition (dysmenorrhoea) **Inclusion criteria:** Primary dysmenorrhoea; Pain (> 5 on 10-point VAS) **Exclusion criteria:** Use of analgesics or other medications **ICD code:** GA34.3 Dysmenorrhoea	**Name:** AT - lavender (massage) **What – essential oil & procedure:** lavender (10% in olive oil) administered by massage to symphysis pubis and umbilicus, according to a protocol **When & how much:** 30 min daily for 2 days at the start of 2 consecutive cycles **Who administered (provider; AT training):** provider administered (NR; NR) **Co-intervention(s):** n/a	**Name:** inactive - no intervention **What – materials & procedure:** n/a **When & how much:** n/a **Who administered (provider):** n/a **No. arms included in synthesis (treatment & control):** 3 **Ineligible arms:** Isometric exercises	**Eligible outcomes:** Pain: pain intensity (VAS)*; duration of pain **Ineligible outcomes:** Emotional functioning/mental health: anxiety (STAI) **Timing of outcome measurement:** intervention group: post-massage, day 1 and 2 of 1st cycle; day 1 and 2 of 2nd cycle* (only one VAS score reported for each cycle; unclear if mean of day 1 and day 2 scores) control group: end of week 4 and week 8*
Azizi 2020 [333-S] **Country:** Iran **Setting (detail):** hospital - inpatient (Labour ward) **Study design:** parallel group	**No. randomised (age; sex):** 90 adults (AT. 25 years, C1. 26, C2. 25 [mean]; 100% female) **Treatment goal:** relieve symptoms of a condition (labour, first stage) **Inclusion criteria:** Primiparous women **Exclusion criteria:** Pain relief medication used during labour **ICD code:** Labour, first stage	**Name:** AT - ginger (massage) **What – essential oil & procedure:** ginger (2%, carrier: inert base oil) administered by back massage **When & how much:** 10 to 15 drops for 15 mins at 4-5, 6-7, and 8-10 cm dilation **Who administered (provider; AT training):** provider administered (research staff; NR) **Co-intervention(s):** n/a	**Name:** C1 inactive control - massage (co-intervention) C2 inactive - no intervention **What – materials & procedure:** C1-paraffin oil (100%) massaged into back C2-n/a **When & how much:** C1-10 to 15 drops for 15 mins at 4-5, 6-7, and 8-10 cm dilation C2-n/a **Who administered (provider):** C1-provider administered C2-n/a **No. arms included in synthesis (treatment & control):** 3 **Ineligible arms:** none	**Eligible outcomes:** Pain: pain intensity (VAS)* **Ineligible outcomes:** n/a **Timing of outcome measurement:** 4-5, 6-7 cm, 8-10* cm dilation
Babaii 2015 [078-S]	**No. randomised (age; sex):**	**Name:** AT - rose (inhalation)	**Name:** inactive - no intervention **What – materials & procedure:** n/a	**Eligible outcomes:**

Study details	Population	Aromatherapy intervention arm(s)	Comparator arm(s)	Outcomes (* = selected for synthesis)
Country: Iran **Setting (detail):** hospital - inpatient (Catheterization laboratory ward) **Study design:** parallel group	60 adults (AT. 54 years, C. 57 [mean]; % female NR) **Treatment goal:** relieve procedure-related side effects (intravenous catheterisation) **Inclusion criteria:** Scheduled for cardiac catheterization **Exclusion criteria:** Anxiety disorders; history of psychological drug use **ICD code:** Cardiac patients (intravenous catheterisation)	**What – essential oil & procedure:** rose (10%, carrier n/a) applied on paper towel and attached to patient's shirt **When & how much:** 10 drops, 1 x 18 mins, 4 hrs prior to procedure **Who administered (provider; AT training):** provider administered (NR; NR) **Co-intervention(s):** n/a	**When & how much:** n/a **Who administered (provider):** n/a **No. arms included in synthesis (treatment & control):** 2 **Ineligible arms:** none	Emotional functioning/mental health: preprocedural anxiety (STAI - total, trait, state*) **Ineligible outcomes:** n/a **Timing of outcome measurement:** ~4 hours before catherization (immediately after the AT intervention)*
Babatabar Darzi 2020 [066-S] **Country:** Iran **Setting (detail):** hospital - inpatient (cardiac care unit (CCU)) **Study design:**	**No. randomised (age; sex):** 160 adults (AT1. 58 years, AT2. 61, C1. 62, C2. 58 [mean]; AT1. 30% female. AT2. 38%, C1. 53%, C2. 38%) **Treatment goal:** relieve surgery-related side effects (open heart surgery) **Inclusion criteria:** Scheduled for first open heart surgery **Exclusion criteria:** **ICD code:** Open heart surgery	**Name:** AT1 - lavender (inhalation) AT2 - rose (inhalation) **What – essential oil & procedure:** AT1. lavender or AT2. rose (undiluted, carrier n/a) administered on a cotton swab placed on chest **When & how much:** 3 drops of oil (0.2 mL) for 15 mins, once after first inspiration post-surgery **Who administered (provider; AT training):** provider administered (NR; NR) **Co-intervention(s):** usual care as per comparator arm	**Name:** C1 inactive - placebo C2 inactive - usual care **What – materials & procedure:** C1- water administered via cotton swab placed on the patient's chest. C2-usual care not described **When & how much:** C1-3 drops of water (0.2mL) for 15 mins, once after first inspiration post-surgery C2-n/a **Who administered (provider):** C1- provider administered C2-n/a **No. arms included in synthesis (treatment & control):** 4 **Ineligible arms:** none	**Eligible outcomes:** Pain: postoperative pain intensity - early acute (VAS)* Emotional functioning/mental health: postoperative anxiety - early acute (STAI - state)* **Ineligible outcomes:** Other: extubation time **Timing of outcome measurement:** after transfer to CCU and first triggered inspiration/spontaneous respiration*
Bagheri 2020 [069-S] **Country:** Iran **Setting (detail):** hospital - inpatient (surgical recovery unit) **Study design:** parallel group	**No. randomised (age; sex):** 90 adults (AT. 44 years, C. 43 [mean]; AT. 2% female, C. 9%) **Treatment goal:** relieve surgery-related side effects (inguinal hernia) **Inclusion criteria:** Scheduled for inguinal hernia surgery; **Exclusion criteria:** History of surgery; received analgesia within 2 hrs prior to surgery	**Name:** AT - lavender (inhalation) **What – essential oil & procedure:** lavender (2%, carrier: sweet almond oil) administered by oxygen face mask **When & how much:** 4 drops oil added to 30mL distilled water; once for 20 mins post-surgery	**Name:** inactive - usual care **What – materials & procedure:** oxygen therapy delivered via face mask **When & how much:** 6 L/min post-surgery for min. 20 mins **Who administered (provider):** provider administered **No. arms included in synthesis (treatment & control):** 2	**Eligible outcomes:** Pain: postoperative pain intensity - early acute (VAS)* **Ineligible outcomes:** n/a **Timing of outcome measurement:** 2*, 6 and 24 hrs after surgery

Study details	Population	Aromatherapy intervention arm(s)	Comparator arm(s)	Outcomes (* = selected for synthesis)
	ICD code: DD51 Inguinal hernia (surgery)	**Who administered (provider; AT training):** provider administered (NR; NR) **Co-intervention(s):** n/a	**Ineligible arms:** none	
Bahrami 2018 [068-S] **Country:** Iran **Setting (detail):** hospital - inpatient (Coronary care unit) **Study design:** parallel group	**No. randomised (age; sex):** 90 elderly (AT. 74 years, C. 73 [mean]; 100% female) **Treatment goal:** relieve treatment-related side effects (CVD inpatient stress) **Inclusion criteria:** Acute coronary syndrome (requiring hospitalisation) **Exclusion criteria:** Anxiolytics or sedatives in last 4 hours; severe haemodynamic instability **ICD code:** BA4Z Acute ischaemic heart disease, unspecified	**Name:** AT - lavender (massage) + reflexology **What – essential oil & procedure:** lavender (% NR, carrier: coconut oil) administered by foot massage and reflexology according to a protocol **When & how much:** 10 drops oil to each foot, 1 x 20-minute massage **Who administered (provider; AT training):** provider administered (research staff; NR) **Co-intervention(s):** see comparator arm	**Name:** inactive control - massage + reflexology (co-intervention) **What – materials & procedure:** almond oil administered by foot massage and reflexology according to a protocol **When & how much:** 6 drops oil to each foot, 1 x 20-minute massage **Who administered (provider):** provider administered **No. arms included in synthesis (treatment & control):** 2 **Ineligible arms:** inactive comparator - usual care (NO reflexology)	**Eligible outcomes:** Emotional functioning/mental health: acute mental distress during hospitalisation (HADS - anxiety* and depression subscales) [Bahrami 2020] **Ineligible outcomes:** Fatigue severity (Rhoten fatigue scale); Physiological function, signs and symptoms: SBP, DBP, HR, RR, MAP, SaO2; Cognitive function (abbreviated mental test) **Timing of outcome measurement:** immediately after AT (single treatment)*
Bakhtshirin 2015 [329-S] **Country:** Iran **Setting (detail):** community based (University dormitory) **Study design:** crossover	**No. randomised (age; sex):** 80 adults (20.4 years [mean]; 100% female) **Treatment goal:** relieve symptoms of a condition (dysmenorrhoea) **Inclusion criteria:** Pain (>6 VAS on first day of menstruation) **Exclusion criteria:** **ICD code:** GA34.3 Dysmenorrhoea	**Name:** AT - lavender (massage) **What – essential oil & procedure:** lavender (2%, almond oil carrier) administered by abdominal massage **When & how much:** 1 x 15-min massage with 2mL of oil (onset of pain at start of menstruation) **Who administered (provider; AT training):** provider administered (research staff; AT training) **Co-intervention(s):** n/a	**Name:** inactive control - massage (co-intervention) **What – materials & procedure:** oil (unspecified) administered by abdominal massage **When & how much:** 1 x 15-min massage with 2mL of oil (onset of pain at start of menstruation) **Who administered (provider):** provider administered **No. arms included in synthesis (treatment & control):** 2 **Ineligible arms:** none	**Eligible outcomes:** Pain: pain intensity (VAS*) **Ineligible outcomes:** n/a **Timing of outcome measurement:** 30 minutes after massage (AT or placebo)*
Ballard 2002 [162-S] **Country:** United Kingdom	**No. randomised (age; sex):** 72 adults (AT. 77 years [mean], C. 80; AT. 56% female, C. 64%)	**Name:** AT - melissa (massage) **What – essential oil & procedure:** melissa (10%, carrier: sweet almond oil and other base products in	**Name:** inactive control - massage (co-intervention) **What – materials & procedure:** sunflower oil (carrier: sweet almond oil	**Eligible outcomes:** Emotional functioning/mental health: agitation (CMAI - overall*; subscales: physical aggression, physical nonaggression, verbal aggression, verbal

Study details	Population	Aromatherapy intervention arm(s)	Comparator arm(s)	Outcomes (* = selected for synthesis)
Setting (detail): aged care facility (Nursing home) **Study design:** parallel group	**Treatment goal:** relieve symptoms of a condition (agitation, dementia) **Inclusion criteria:** Severe dementia (CDR stage 3); Clinically significant agitation (per NPI); **Exclusion criteria:** **ICD code:** 6D8Z Dementia, Unknown or Unspecified Cause	lotion) administered to face and both arms **When & how much:** 1 - 2 minute massage (in total) with 0.16 g lotion, twice per day (200 mg oil per day) for 4 weeks **Who administered (provider; AT training):** provider administered (other; NR) **Co-intervention(s):** n/a	and other base products in lotion) administered to face and both arms **When & how much:** 1 - 2 minute massage (in total) with 0.16 g lotion, twice per day (200 mg oil per day) for 4 weeks **Who administered (provider):** provider administered **No. arms included in synthesis (treatment & control):** 2 **Ineligible arms:** none	nonaggression; NPI subscales: irritability, aberrant motor behavior) [Ballard 2002] HR-QoL: HRQoL (DCM behaviours: % time spent social withdraw*, % time engaged in constructive activities) [Lee 2003] **Ineligible outcomes:** ADL: Barthel scale (results not reported) **Timing of outcome measurement:** week 1, 2, 3, and 4 (end of AT intervention period)*
Barclay 2006 [161-S] **Country:** United Kingdom **Setting (detail):** hospital - outpatient, community based (Cancer centre's lymphoedema service; home) **Study design:** parallel group	**No. randomised (age; sex):** 81 adults (AT. 61 years [mean], C. 60; AT. 100% female, C. 93%) **Treatment goal:** relieve symptoms of a condition (lymphoedema) **Inclusion criteria:** Bilateral or unilateral stable lymphoedema of the limb(s) for $\geqslant$ 1 year **Exclusion criteria:** Acute inflammation, thrombosis or recurrence; chronic oedema secondary to other conditions **ICD code:** BD93.0 Primary lymphoedema or BD93.1 Secondary lymphoedema	**Name:** AT - essential oil blend (massage) **What – essential oil & procedure:** fennel, sage, geranium, black pepper, juniper (% NR, mixed with wheatgerm oil in a base cream), self-administered via limb massage and self-lymphatic drainage **When & how much:** daily for 3 months **Who administered (provider; AT training):** self-administered, provider prescribed (NR; NR) **Co-intervention(s):** n/a	**Name:** inactive - massage (co-intervention) **What – materials & procedure:** wheatgerm oil (% NR in a base cream), self-administered via limb massage and self-lymphatic drainage **When & how much:** daily for 3 months **Who administered (provider):** self-administered, provider prescribed **No. arms included in synthesis (treatment & control):** 2 **Ineligible arms:** none	**Eligible outcomes:** HR-QoL: overall HR-QoL (MYMOP2 - well-being scores)* **Ineligible outcomes:** 'Other' symptoms: symptom relief (MYMOP2 - symptom 1 scores); Physiological function, signs and symptoms: absolute limb volume **Timing of outcome measurement:** months 1, 2 and 3* [6-mth follow-up only for participants with symptom improvement]
Beyliklioğlu 2019 [160-S] **Country:** Turkey **Setting (detail):** hospital - inpatient (General surgery clinic) **Study design:** parallel group	**No. randomised (age; sex):** 80 adults (AT. 51 years, C. 48 [mean]; 100% female) **Treatment goal:** relieve surgery-related side effects (breast surgery) **Inclusion criteria:** Scheduled for breast surgery; Breast cancer; **Exclusion criteria:** Psychiatric disorders **ICD code:**	**Name:** AT - lavender (topical) **What – essential oil & procedure:** lavender (undiluted, carrier n/a) inhaled from gauze bandage **When & how much:** 3 - 4 drops, inhaled for 20 minutes on day of (and prior to) surgery **Who administered (provider; AT training):** self-administered, provider prescribed (NR; NR)	**Name:** inactive - usual care **What – materials & procedure:** instructions in the safe surgery control list (details NR) **When & how much:** n/a **Who administered (provider):** provider administered **No. arms included in synthesis (treatment & control):** 2 **Ineligible arms:** none	**Eligible outcomes:** Emotional functioning/mental health: preoperative anxiety (STAI - state)* **Ineligible outcomes:** n/a **Timing of outcome measurement:** before transfer to the operating theatre*

Study details	Population	Aromatherapy intervention arm(s)	Comparator arm(s)	Outcomes (* = selected for synthesis)
	2C6Z Malignant neoplasms of breast, unspecified (various breast surgery)	**Co-intervention(s):** usual care as per comparator arm		
Biçer 2015 [159-S] **Country:** Turkey **Setting (detail):** hospital - outpatient (Haemodialysis unit) **Study design:** parallel group	**No. randomised (age; sex):** 50 adults (AT. 59 years, C. 55 [mean]; AT. 60% female, C. 40%) **Treatment goal:** relieve procedure-related side effects (haemodialysis) **Inclusion criteria:** Scheduled for haemodialysis (3 times per week); Pain (⩾ 3 on 10-point VAS) **Exclusion criteria:** Facial surgery; facial nerve or tissue disease **ICD code:** 8A84.Y Other specified secondary headache (haemodialysis); GB61 Chronic kidney disease	**Name:** AT - lavender & rosemary (massage) **What – essential oil & procedure:** lavender & rosemary (1mL each in 48 mL sesame oil) administered by facial massage according to a protocol **When & how much:** massage for first hour of each dialysis session, 3 days per week for 3 weeks (9 sessions) **Who administered (provider; AT training):** provider administered (research staff; AT training) **Co-intervention(s):** usual care as per comparator arm	**Name:** inactive - usual care **What – materials & procedure:** analgesic medicine **When & how much:** NR **Who administered (provider):** provider administered **No. arms included in synthesis (treatment & control):** 2 **Ineligible arms:** none	**Eligible outcomes:** Pain: headache intensity (VAS)* **Ineligible outcomes:** n/a **Timing of outcome measurement:** one hour before and one hour after* the AT massage, weeks 1, 2 and 3* (reported as mean of the 3 weekly pre and post AT sessions)
Bikmoradi 2016 [285-S] **Country:** Iran **Setting (detail):** hospital - inpatient (Burns ward) **Study design:** parallel group	**No. randomised (age; sex):** 54 adults (AT. 33 years, C. 34 [mean]; AT. 40% female, C. 48%) **Treatment goal:** relieve procedure-related side effects (dressing change, burns) **Inclusion criteria:** Burns (2nd and/or 3rd degree); **Exclusion criteria:** Inhalation, electrical or deliberate burns Burns to face or eyes **ICD code:** NE2Z Burns, unspecified, 2nd or 3rd degree (dressing change)	**Name:** AT - damask rose (inhalation) **What – essential oil & procedure:** rose damask (40%, carrier: distilled water) administered 10 × 10 cm gauze pad attached to collar area **When & how much:** participants wore pad with 5 drops oil for 20 mins immediately prior to dressing change on 2 consecutive days **Who administered (provider; AT training):** provider administered (nurse clinically qualified; NR) **Co-intervention(s):** n/a	**Name:** inactive - placebo **What – materials & procedure:** distilled water administered 10 × 10 cm gauze pad attached to collar area **When & how much:** participants wore pad with 5 drops distilled water for 20 mins immediately prior to dressing change on 2 consecutive days **Who administered (provider):** provider administered **No. arms included in synthesis (treatment & control):** 2 **Ineligible arms:** none	**Eligible outcomes:** Pain: postprocedural pain intensity - early acute (VAS)* **Ineligible outcomes:** Physiological function, signs and symptoms: SBP, DBP, HR, RR. **Timing of outcome measurement:** 15* and 30 minutes after dressing change on days 1 and 2* of AT intervention period
Blackburn 2017 [158-S] **Country:** United States	**No. randomised (age; sex):** 53 adults (19 - 72 years [range]; 44% female) **Treatment goal:** relieve treatment-related side effects (chemotherapy)	**Name:** AT (P1) - essential oil selection (inhalation) AT (P2) - essential oil selection (inhalation)	**Name:** C (P1) inactive - placebo C (P2) - inactive - placebo	**Eligible outcomes:** Pain: pain intensity (ESASr - pain NRS)* Nausea & vomiting: nausea severity (ESASr - nausea NRS)*

Study details	Population	Aromatherapy intervention arm(s)	Comparator arm(s)	Outcomes (* = selected for synthesis)
Setting (detail): hospital - inpatient (Acute leukaemia unit) **Study design:** crossover	**Inclusion criteria:** Acute leukaemia (newly diagnosed); Starting 4 weeks of in-patient chemotherapy **Exclusion criteria:** n/a **ICD code:** XH1B20 Acute leukaemia, NOS (chemotherapy)	**What – essential oil & procedure:** lavender, chamomile or peppermint (% and carrier NR) administered by diffuser within patient room (patient selected their preferred oil; washout period 1 week) **When & how much:** 8 drops oil overnight (maximum 8 hours) for 1 week **Who administered (provider; AT training):** provider administered (NR; AT training) **Co-intervention(s):** n/a	**What – materials & procedure:** rose water administered by diffuser within patient room (washout period 1 week) **When & how much:** 8 drops oil overnight (maximum 8 hours) for 1 week **Who administered (provider):** provider administered **No. arms included in synthesis (treatment & control):** 4 **Ineligible arms:** none	Sleep: sleep quality (PSQI: global score*; subscales: daytime dysfunction, habitual sleep efficiency, sleep disturbance, sleep duration, sleep latency, sleep quality, use of sleeping medication) Fatigue: fatigue severity (ESASr - tiredness NRS)* Emotional functioning/mental health: mental distress - anxiety (ESASr - anxiety NRS)*; depression symptom severity (ESASr - depression NRS) **Ineligible outcomes:** Other symptoms: symptom severity (ESASr: overall symptoms; drowsiness, lack of appetite, shortness of breath, well-being) **Timing of outcome measurement:** days 1-7 (immediately after each AT treatment; pain*, nausea*, fatigue*, anxiety*); day 7 (end of AT intervention period; sleep*)
Bozkurt 2019 [117-S] **Country:** Turkey **Setting (detail):** hospital - inpatient (Patient room) **Study design:** parallel group	**No. randomised (age; sex):** 90 adults (AT1. 25 years, AT2. 27, C. 25; AT1. 40% female, AT2. 32%, C. 28%) **Treatment goal:** relieve surgery-related side effects (orthognathic surgery) **Inclusion criteria:** Scheduled for orthognathic surgery (bilateral sagittal split osteotomy, Le Fort I osteotomy, or bimaxillary osteotomy) **Exclusion criteria:** Psychiatric disorders; use of psychotropic medications **ICD code:** Orthognathic surgery	**Name:** AT1 - lavender (inhalation, 0.08%) AT2 - lavender (inhalation, 0.25%) **What – essential oil & procedure:** AT1. lavender (0.083%) or AT2. lavender (0.25%) in water, administered via an infuser with output of 30 mL/h in 12 sqm room **When & how much:** diffusion for 30 mins (patients remained in room with door closed for a total of 1 hr prior to surgery) **Who administered (provider; AT training):** provider administered (NR; NR) **Co-intervention(s):** n/a	**Name:** inactive - placebo **What – materials & procedure:** distilled water (120 mL) administered via an infuser with output of 30 mL/h in 12 sqm room **When & how much:** diffusion for 30 mins (patients remained in room with door closed for a total of 1 hr prior to surgery) **Who administered (provider):** provider administered **No. arms included in synthesis (treatment & control):** 3 **Ineligible arms:** none	**Eligible outcomes:** Emotional functioning/mental health: preoperative anxiety (STAI - state subscale*) **Ineligible outcomes:** n/a **Timing of outcome measurement:** immediately before transfer into the operating theatre*
Burns 2007 [156-S]	**No. randomised (age; sex):**	**Name:** AT - essential oil selection (various modes)	**Name:** inactive - usual care	**Eligible outcomes:**

Study details	Population	Aromatherapy intervention arm(s)	Comparator arm(s)	Outcomes (* = selected for synthesis)
Country: Italy **Setting (detail):** hospital - inpatient (Labour ward) **Study design:** parallel group	513 participants (AT. 32 years, C. 32 [mean]; 100% female) **Treatment goal:** relieve symptoms of a condition (labour, stage unspecified) **Inclusion criteria:** Pregnant women > 36 weeks gestation with singleton pregnancy and cephalic presentation **Exclusion criteria:** Multiple pregnancy; breech presentation; elective caesarean. **ICD code:** Labour, stage unspecified	**What – essential oil & procedure:** roman chamomile, clary sage, frankincense, lavender, or mandarin (% NR, carrier: sweet almond) administered by one or more of acupressure points, taper (inhalation), compress, footbath, massage or birthing pool (patient selected preferred oil and mode of delivery) **When & how much:** NR **Who administered (provider; AT training):** provider administered (nurse clinically qualified; AT training) **Co-intervention(s):** usual care as per comparator arm	**What – materials & procedure:** usual care not described **When & how much:** n/a **Who administered (provider):** NR **No. arms included in synthesis (treatment & control):** 2 **Ineligible arms:** none	Pain: pain intensity* (10-point Likert; collected for AT group only); use of rescue analgesics (data could not be collected due to 'low uptake' of pharmacological pain relief) **Ineligible outcomes:** 'Other' pregnancy, puerperium and perinatal outcomes: labour onset, rupture of membranes, number of vaginal examinations, labour augmentation using oxytocin, episiotomy, type of delivery, duration of labour; neonatal outcomes (Apgar scores at 1, 5, and 10 minutes; admission to the NICU) **Timing of outcome measurement:** 30 - 40 minutes after AT treatment* (pain intensity, measured for AT group only); timing NR (other outcomes)
Burns 2011 [157-S] **Country:** United Kingdom **Setting (detail):** aged care facility (Nursing home & continuing care facilities) **Study design:** parallel group	**No. randomised (age; sex):** 77 elderly (AT. 86 years, C. 85 [mean]; AT. 66% female, C. 48%) **Treatment goal:** relieve symptoms of a condition (agitation, Alzheimers disease) **Inclusion criteria:** Clinical dementia rating of 3 (Hughes et al); Probable/possible Alzheimer's disease (NINCDS/ADRDA criteria); Agitation for $\geqslant$ 4 weeks and CMAI score of 139; Resident of nursing home or NHS continuing care facility **Exclusion criteria:** Psychotropic medications for $\geqslant$ 2 weeks; uncontrolled or severe conditions (epilepsy, cardiovascular disease, COPD); history of stroke **ICD code:** 6D80 Dementia due to Alzheimer disease (probable or possible); 6D86.4 Agitation or aggression in dementia	**Name:** AT - lemon balm (massage) + placebo medication (tablets) **What – essential oil & procedure:** lemon balm (10% in base lotion), administered by hand and upper arm massage according to a protocol + placebo tablets matching donezepil tablets [donezepil = active comparator, not incl. in synthesis] **When & how much:** 1-2 minute massage with 1mL lotion twice per day for 12 weeks **Who administered (provider; AT training):** provider administered (other; AT training) **Co-intervention(s):** n/a	**Name:** inactive - placebo (massage) + placebo medication (tablets) **What – materials & procedure:** sunflower oil (10% in base lotion), administered by hand and upper arm massage according to a protocol + placebo tablets matching donezepil tablets **When & how much:** 1-2 minute massage with 1mL lotion twice per day for 12 weeks **Who administered (provider):** provider administered **No. arms included in synthesis (treatment & control):** 2 **Ineligible arms:** medication (donepezil)	**Eligible outcomes:** Emotional functioning/mental health: agitation (PAS - total*; NPI - agitation/aggression subscale); BPSD (NPI - overall; subscales: delusions, hallucinations, depression/dysphoria, anxiety, euphoria, apathy/indifference, disinhibition, irritability, aberrant motor behaviour, sleep, appetite/eating disorder); HR-QoL: overall HR-QoL (Blau QoL scale)* **Ineligible outcomes:** Activities of daily living (Barthel scale) **Timing of outcome measurement:** week 4; week 12 (end of AT intervention period)*
Cheraghbeigi 2019	**No. randomised (age; sex):**	**Name:** AT - lavender (massage)	**Name:** C2 inactive - no intervention	**Eligible outcomes:**

Study details	Population	Aromatherapy intervention arm(s)	Comparator arm(s)	Outcomes (* = selected for synthesis)
[070-S] **Country:** Iran **Setting (detail):** hospital - inpatient (Medical wards) **Study design:** parallel group	150 adults (49 years [mean]; AT1. 44% female, C1. 40%, C2. 42%) **Treatment goal:** relieve treatment-related side effects (CVD inpatient stress) **Inclusion criteria:** Diagnosed with cardiac disorders; Significant sleep disturbance (PSQI > 5); Hospitalised for ⩾ 48 hrs **Exclusion criteria:** History of neuropsychiatric disease and taking psychiatric medications; receiving sedative medications and/or oxygen **ICD code:** MG41 Sleep disturbance (significant) (cardiac patients)	**What – essential oil & procedure:** lavender (1.5% in sweet almond oil) administered by hand and foot massage as per protocol **When & how much:** 10-15 mL for 20-min massage nightly at 22:00 x 7 nights **Who administered (provider; AT training):** provider administered (nurse clinically qualified, research staff; AT training) **Co-intervention(s):** n/a	C1 inactive control - massage (co-intervention) **What – materials & procedure:** C2-n/a C1-sweet almond oil (100%, carrier n/a) administered by hand and foot massage as per protocol **When & how much:** C2-n/a C1-20-min massage nightly at 22:00 x 7 nights (amount NR) **Who administered (provider):** C2-n/a C1-provider administered **No. arms included in synthesis (treatment & control):** 3 **Ineligible arms:** none	Sleep: sleep quality overall (PSQI - total)* **Ineligible outcomes:** n/a **Timing of outcome measurement:** day 8 (morning after 7-day AT intervention)*
Cho 2017 [409-S] **Country:** South Korea **Setting (detail):** hospital - emergency (Emergency department) **Study design:** parallel group	**No. randomised (age; sex):** 96 adults (AT1. 43 years, AT2. 42, C. 40 [mean]; AT1. 70% female, AT2. 70%, C. 51%) **Treatment goal:** relieve symptoms of a condition (burns) **Inclusion criteria:** Burns (within 3 hours of accident, involving < 5% of body surface) **Exclusion criteria:** Chemical burns; received analgesics prior to intervention **ICD code:** XJ4NH Burns involving less than 5% of body surface	**Name:** AT1 - tea tree (topical spray) AT2 - tea tree (topical dressing) **What – essential oil & procedure:** AT1. tea tree (Burn Cool Spray) or AT2. tea tree (Burnshield) administered via dressing (% and carrier NR) **When & how much:** AT1. sprayed over the whole burn every 5 minutes for total 20 minutes AT2. 20 minutes **Who administered (provider; AT training):** provider administered (research staff; NR) **Co-intervention(s):** n/a	**Name:** inactive - usual care **What – materials & procedure:** tap water (23.9 to 27.3 C) administered by shower **When & how much:** continuous for 20 minutes, within 3 hours of burn **Who administered (provider):** provider administered **No. arms included in synthesis (treatment & control):** 3 **Ineligible arms:** none	**Eligible outcomes:** Pain: pain overall (VAS)* **Ineligible outcomes:** 'Other' symptoms: skin surface temperature **Timing of outcome measurement:** after 20 min of treatment*
Choi 2016.1 [151-S] **Country:** South Korea **Setting (detail):** community based (Home)	**No. randomised (age; sex):** 62 adults (AT. 29 years [mean], C. 31; % female NR) **Treatment goal:** relieve symptoms of a condition (perennial allergic rhinitis) **Inclusion criteria:** Perennial allergic rhinitis (PAR) as diagnosed by physician	**Name:** AT - essential oil blend (inhalation) **What – essential oil & procedure:** sandalwood, ravensara & frankincense (0.2% in almond oil), placed on a pad, 30 cm away from nose	**Name:** inactive - placebo **What – materials & procedure:** almond oil, placed on a pad, 30 cm away from nose **When & how much:** 1 mL, 2 x 5 minutes daily (10 am and 10 pm) for 7 days	**Eligible outcomes:** Fatigue: severity of fatigue (Chalder Fatigue Scale (CFS) - total score)* HR-QoL: overall HR-QoL (RQLQ - total score*); HR-QoL subdomains (RQLQ - activity limitation, sleep problems, nose symptoms, eye symptoms, non nose/eye

Study details	Population	Aromatherapy intervention arm(s)	Comparator arm(s)	Outcomes (* = selected for synthesis)
Study design: parallel group	**Exclusion criteria:** Current medication or treatment for PAR; psychiatric illnesses **ICD code:** CA08.03 Other allergic rhinitis	**When & how much:** 1mL, 2 x 5 minutes daily (10 am and 10 pm) for 7 days **Who administered (provider; AT training):** self-administered, provider prescribed (research staff; NR) **Co-intervention(s):** n/a	**Who administered (provider):** self-administered, provider prescribed **No. arms included in synthesis (treatment & control):** 2 **Ineligible arms:** none	symptoms, practical problems, emotional function) **Ineligible outcomes:** Sleep: sleep quality (Verran Synder-Halpern - total score) 'Other' symptoms: allergic rhinitis symptom (Total Nasal Symptom Score (TNSS)) **Timing of outcome measurement:** day 8 (end of 7-day AT intervention period)*
Cino 2014 [150-S] **Country:** United States **Setting (detail):** aged care facility (Long-term care facilities) **Study design:** parallel group	**No. randomised (age; sex):** 118 adults (83 years [mean]; 75% female) **Treatment goal:** relieve symptoms of a condition (chronic pain) **Inclusion criteria:** Chronic pain; Brief Mental Status score ⩾ 8/15 on Minimal Data Set **Exclusion criteria:** Neuropathy **ICD code:** MG30 Chronic pain	**Name:** AT - lavender (massage) **What – essential oil & procedure:** lavender (1% diluted in massage oil) administered by M technique hand massage according to a protocol **When & how much:** 20-minute massage 2 x weekly for 4 weeks **Who administered (provider; AT training):** provider administered (nurse clinically qualified; n/a) **Co-intervention(s):** n/a	**Name:** C1 inactive control - massage (co-intervention) C2 inactive - usual care **What – materials & procedure:** C1-M technique hand massage according to a protocol C2-attentive conversation without touch **When & how much:** C1-20-minute massage 2 x weekly for 4 weeks C2-20 minutes 2 x weekly for 4 weeks **Who administered (provider):** C1-provider administered C2-provider administered **No. arms included in synthesis (treatment & control):** 3 **Ineligible arms:** none	**Eligible outcomes:** Pain: pain sensation/intensity (GMPI inventory, pain intensity and suffering scale)*; pain intensity (VRS, Iowa Pain Thermometer) Physical function: pain-related functional impairment (GMPI inventory, life interference scale)* HRQOL: pain-related emotional distress (GMPI inventory, emotional distress scale)* **Ineligible outcomes:** n/a **Timing of outcome measurement:** weeks 2 - 4 (before and immediately after each treatment, IPT), week 6 (end of AT intervention period, GMPI and IPT)*
Citlik Saritas 2020 [328-S] **Country:** Turkey **Setting (detail):** hospital - outpatient (Gastroenterology clinic) **Study design:** parallel group	**No. randomised (age; sex):** 90 adults (AT. 49 years, C. 51 [mean]; AT. 33% female, C. 42%) **Treatment goal:** relieve procedure-related side effects (endoscopic cholangiopancreatography) **Inclusion criteria:** Scheduled for endoscopic retrograde cholangiopancreatography (ERCP) **Exclusion criteria:** **ICD code:**	**Name:** AT - lavender (inhalation) **What – essential oil & procedure:** lavender (undiluted, carrier n/a) administered on a 3 x 3 inch sterile gauze placed on the chest **When & how much:** 4 drops of oil inhaled for at least 30 mins on the day of (and before) the ERCP procedure	**Name:** inactive - usual care **What – materials & procedure:** usual care not described **When & how much:** n/a **Who administered (provider):** n/a **No. arms included in synthesis (treatment & control):** 2 **Ineligible arms:** none	**Eligible outcomes:** Pain: preprocedural pain intensity (VAS)* Emotional functioning/mental health: preprocedural anxiety (STAI-I)* **Ineligible outcomes:** Physiological function, signs and symptoms: SBP, DBP, HR, SpO2. **Timing of outcome measurement:** pre-procedure*

Study details	Population	Aromatherapy intervention arm(s)	Comparator arm(s)	Outcomes (* = selected for synthesis)
	Endoscopic retrograde cholangiopancreatography (ERCP)	**Who administered (provider; AT training):** provider administered (NR; NR) **Co-intervention(s):** usual care as per comparator arm		
Corner 1995 [327-S] **Country:** United Kingdom **Setting (detail):** hospital - inpatient (Cancer centre) **Study design:** parallel group	**No. randomised (age; sex):** 34 adults (48 years [mean], 90% female) **Treatment goal:** relieve treatment-related side effects (any cancer) **Inclusion criteria:** Cancer patients undergoing active treatment **Exclusion criteria:** n/a **ICD code:** 02 Neoplasms	**Name:** AT - essential oil blend (massage) **What – essential oil & procedure:** lavender, rosewood, lemon, rose, valerian (2% overall in vegetable oil), applied by back massage **When & how much:** 1 x 30-minute massage per week for 8 weeks **Who administered (provider; AT training):** provider administered (aromatherapist, massage therapist, nurse clinically qualified, research staff; NR) **Co-intervention(s):** n/a	**Name:** inactive - massage (co-intervention) **What – materials & procedure:** vegetable oil (undiluted, carrier: n/a) administered by back massage **When & how much:** 1 x 30-minute massage per week for 8 weeks **Who administered (provider):** provider administered **No. arms included in synthesis (treatment & control):** 2 **Ineligible arms:** none	**Eligible outcomes:** Emotional functioning/mental health: mental distress - anxiety (HADS - anxiety* and depression subscales) **Ineligible outcomes:** 'Other' symptoms: symptom distress (QoL and symptom distress scale) **Timing of outcome measurement:** weeks 1, 2, 3, 4, 5, 6, 7 and 8* (end of AT intervention period; measures taken before and 24 hours after each AT treatment)
Dagli 2019 [108-S] **Country:** Turkey **Setting (detail):** hospital - inpatient (Otorhinolaryngology clinic) **Study design:** parallel group	**No. randomised (age; sex):** 99 adults (AT. 29 years, C1. 27, C2. 27 [mean]; AT. 58% female, C1. 55% C2. 64%) **Treatment goal:** relieve surgery-related side effects (rhinoplasty) **Inclusion criteria:** Undergoing septorhinoplasty/rhinoplasty surgery; Healthy or mild systemic disease (ASA physical status I or II); **Exclusion criteria:** Hypertension, cardiac dysrhythmia, chronic depression and anxiety **ICD code:** Septorhinoplasty / Rhinoplasty	**Name:** AT - rose (inhalation) **What – essential oil & procedure:** rose (undiluted, carrier: distilled water/ethyl alcohol solution) administered via nebuliser **When & how much:** 2 mL oil in 10 mL solution via nebuliser for 15 mins before going into the operating room **Who administered (provider; AT training):** provider administered (nurse clinically qualified; AT training) **Co-intervention(s):** n/a	**Name:** C1 inactive - no intervention C2 inactive - placebo **What – materials & procedure:** C1-n/a C2-distilled water/ethyl alcohol administered via nebuliser **When & how much:** C1-n/a C2-10 mL solution via nebuliser for 15 mins before going into the operating room **Who administered (provider):** C1-n/a C2-provider administered **No. arms included in synthesis (treatment & control):** 3 **Ineligible arms:** none	**Eligible outcomes:** Emotional functioning/mental health: preoperative anxiety (STAI - state)* **Ineligible outcomes:** Physiological function, signs and symptoms: HR, MAP **Timing of outcome measurement:** immediately prior to the operation (and immediately after AT intervention)*
Daneshpajooh 2019 [057-S]	**No. randomised (age; sex):**	**Name:** AT1 - rose (inhalation) AT2 - AT1 + Benson relaxation	**Name:** C1 inactive - usual care	**Eligible outcomes:**

Study details	Population	Aromatherapy intervention arm(s)	Comparator arm(s)	Outcomes (* = selected for synthesis)
Country: Iran **Setting (detail):** hospital - inpatient (Burn ward) **Study design:** parallel group	140 adults (42 years [mean]; AT1. 15% female, AT2. 15%, C1. 21%, C2. 18%) **Treatment goal:** relieve procedure-related side effects (dressing change, burns) **Inclusion criteria:** Hospitalised for burn injury (second degree or higher) **Exclusion criteria:** Inhalation, electrical, or self-inflicted burns, cognitive-psychological disorders **ICD code:** NE2Z Burns, unspecified, 2nd or 3rd degree (dressing change)	**What – essential oil & procedure:** AT1/AT2. rose (40%, carrier N/A), administered on a 10 x 10 cm gauze, attached to shirt, 20 cm away from nose AT2. + Benson relaxation (see co-intervention comparator arm) **When & how much:** 5 drops inhaled for 20 minutes daily, 30-45 minutes before wound dressing, over 3 consecutive days **Who administered (provider; AT training):** provider administered (research staff; NR) **Co-intervention(s):** n/a	C2 inactive control - Benson relaxation (co-intervention) **What – materials & procedure:** C1-usual care + rest on bed C2-breathing and relaxing following audio instructions as per a protocol **When & how much:** C1-20 minutes daily, 30 - 45 minutes before wound dressing, over 3 consecutive days C2-20 minutes daily, 30 - 45 minutes before wound dressing, over 3 consecutive days **Who administered (provider):** C1-n/a C2-self-administered, provider prescribed **No. arms included in synthesis (treatment & control):** 4 **Ineligible arms:** none	Emotional functioning/mental health: preprocedural [pain] anxiety (BSPAS)* **Ineligible outcomes:** n/a **Timing of outcome measurement:** before the dressing change (before the AT intervention); before the dressing change (immediately after the AT intervention)*; immediately after the dressing change; on days 1, 2 and 3* of the AT intervention period
Darsareh 2012 [149-S] **Country:** Iran **Setting (detail):** hospital - outpatient (Menopausal clinic at a gynecology hospital) **Study design:** parallel group	**No. randomised (age; sex):** 90 adults (AT. 53 years, C1. 52, C2. 54 [mean]; 100% female) **Treatment goal:** relieve symptoms of a condition (menopause) **Inclusion criteria:** Post-menopausal with symptoms as per Menopause Rating Scale (MRS); Amenorrhea for at least 12 months **Exclusion criteria:** Use of any kind of medical treatments (such as hormone therapy) during the study **ICD code:** MB24.5 Depressed mood; GA30.0 Menopause	**Name:** AT - essential oil blend (massage) **What – essential oil & procedure:** lavender, rose geranium, rose, and rosemary oils in a 4:2:1:1 ratio (diluted in almond (90%) and evening primrose oil (10%) to a final concentration of 3%) administered by abdomen, femur, and arm massage **When & how much:** 5 mL, massaged for 30 minutes, twice a week for 4 weeks (8 sessions total) **Who administered (provider; AT training):** provider administered (other; AT training) **Co-intervention(s):** n/a	**Name:** C1 inactive control - massage (co-intervention) C2 inactive - no intervention **What – materials & procedure:** C1-odorless liquid petrolatum or soft paraffin administered by abdomen, femur, and arm massage C2-n/a **When & how much:** C1-5 mL massaged for 30 minutes, twice a week for 4 weeks (8 sessions total) C2-n/a **Who administered (provider):** C1-provider administered C2-n/a **No. arms included in synthesis (treatment & control):** 3 **Ineligible arms:** none	**Eligible outcomes:** HR-QoL: HR-QoL related to menopause (MRS total score)* [Darsareh 2012] Emotional functioning/mental health: mental distress symptom severity (MRS psychological subdomain)* [Tavoni 2013] **Ineligible outcomes:** n/a **Timing of outcome measurement:** week 4 (end of AT intervention period)*
Davari 2021	**No. randomised (age; sex):**	**Name:** AT - lavender (inhalation)	**Name:** inactive - placebo	**Eligible outcomes:**

Study details	Population	Aromatherapy intervention arm(s)	Comparator arm(s)	Outcomes (* = selected for synthesis)
[096-S] **Country:** Iran **Setting (detail):** hospital - inpatient (Open-heart ICU) **Study design:** parallel group	57 adults (AT. 62 years, C. 62 [mean]; AT. 60%, C. 40%) **Treatment goal:** relieve surgery-related side effects (CABG surgery) **Inclusion criteria:** Undergoing non-emergency open-heart surgery **Exclusion criteria:** History of opium use; history of mental illness; use of non-routine sedatives **ICD code:** XA3B03 Coronary arteries disease (coronary artery bypass graft surgery)	**What – essential oil & procedure:** lavender (% NR, carrier n/a), 2 drops placed on a cotton pellet, inhaled for 10 breaths then attached to collar **When & how much:** nights 2, 3 and 4 after surgery, from evening until 8 am the next day **Who administered (provider; AT training):** provider administered (NR; NR) **Co-intervention(s):** n/a	**What – materials & procedure:** distilled water, 2 drops placed on a cotton pellet, inhaled for 10 breaths then attached to collar **When & how much:** nights 2, 3 and 4 after surgery, from evening until 8 am the next day **Who administered (provider):** provider administered **No. arms included in synthesis (treatment & control):** 2 **Ineligible arms:** none	Sleep: sleep quality overall (SMHSQ-11)* **Ineligible outcomes:** Physiological function, signs and symptoms: SBP, HR, RR, SaO2, temperature **Timing of outcome measurement:** morning after night 1, 2 and 3* of AT intervention (days 3, 4 and 5* postoperative)
de Jong 2012 [113-S] **Country:** The Netherlands **Setting (detail):** hospital - inpatient (Paediatric intensive care unit) **Study design:** parallel group	**No. randomised (age; sex):** 60 children (AT. 10 months, C1. 12, C2. 11 [mean] ; AT. 25% female, C1. 15% C2. 35%) **Treatment goal:** relieve surgery-related side effects (craniofacial surgery <18yrs) **Inclusion criteria:** Scheduled for craniofacial surgery; **Exclusion criteria:** Neurological impairment **ICD code:** LB70.0 Craniosynostosis (craniofacial surgery)	**Name:** AT - mandarin (massage) **What – essential oil & procedure:** mandarin (1%, carrier: almond) administered by massage according to a protocol **When & how much:** 1 x 10-minute massage to upper and lower limbs **Who administered (provider; AT training):** provider administered (nurse clinically qualified; NR) **Co-intervention(s):** n/a	**Name:** C1 inactive - massage (co-intervention) C2 inactive - usual care **What – materials & procedure:** C1-almond oil administered by massage according to a protocol C2-Standard postoperative care, including regular paracetamol and extra analgesia if required **When & how much:** C1-1 x 10-minute massage to upper and lower limbs C2-n/a **Who administered (provider):** C1-provider administered C2-n/a **No. arms included in synthesis (treatment & control):** 3 **Ineligible arms:** none	**Eligible outcomes:** Pain: postoperative pain intensity - early acute (COMFORT-B*, NRS-pain, NRS-distress); use of rescue medication (analgesics and sedatives up to 12-hours post-surgery) **Ineligible outcomes:** Physiological function, signs and symptoms: HR, MAP **Timing of outcome measurement:** 20 and 50 mins after end of AT intervention (3.5 and 4 hours postoperatively), reported as a mean of both timepoints*
Dehkordi 2017 [148-S] **Country:** Iran **Setting (detail):** hospital - outpatient (Haemodialysis centres)	**No. randomised (age; sex):** 60 adults (AT. 59 years, C. 58 [mean]; AT. 36% female, C. 36%) **Treatment goal:** relieve procedure-related side effects (haemodialysis)	**Name:** AT - damask rose (inhalation) **What – essential oil & procedure:** damask rose (2%, carrier NR), administered on a piece of cloth and attached to collar	**Name:** inactive - usual care **What – materials & procedure:** usual care not described **When & how much:** **Who administered (provider):** n/a	**Eligible outcomes:** Emotional functioning/mental health: periprocedural anxiety [time period NR] (DASS: anxiety subscale)*; periprocedural stress (DASS: stress subscale)

Study details	Population	Aromatherapy intervention arm(s)	Comparator arm(s)	Outcomes (* = selected for synthesis)
Study design: parallel group	**Inclusion criteria:** Undergoing haemodialysis 3 times per week, for > 3 months **Exclusion criteria:** Mental disorders **ICD code:** QB94 Care involving dialysis; GB61.5 Chronic kidney disease, stage 5	**When & how much:** 3 drops for 1 hour during 3 dialysis sessions per week, for 4 weeks [likely 12 sessions] **Who administered (provider; AT training):** provider administered (NR; NR) **Co-intervention(s):** n/a	**No. arms included in synthesis (treatment & control):** 2 **Ineligible arms:** none	**Ineligible outcomes:** Emotional functioning/mental health: mental distress - depression (DASS: depression subscale) **Timing of outcome measurement:** at end of 4-week AT intervention period*
Deng 2021 [326-S] **Country:** China **Setting (detail):** hospital - inpatient (NR) **Study design:** parallel group	**No. randomised (age; sex):** 160 adults (AT1 54 years, AT2 52, C1 50, C2 54; 100% female) **Treatment goal:** relieve surgery-related side effects (mastectomy) **Inclusion criteria:** Breast cancer; Scheduled for mastectomy **Exclusion criteria:** Serious mental illness **ICD code:** 2C6Z Malignant neoplasms of breast, unspecified (mastectomy)	**Name:** AT1 - essential oil blend (inhalation) AT2 - AT + music therapy **What – essential oil & procedure:** AT1/AT2. lavender, bergamot, geranium (1:2:3 blend, undiluted, carrier n/a) placed at bedside and administered on sterile sponge AT2: + music therapy (see co-intervention comparator) **When & how much:** 60-min bedside diffusion and 3 drops for 15-min inhalation pre-surgery and 30-min bedside diffusion and 3 drops for 15-min inhalation after tracheal extubation **Who administered (provider; AT training):** provider administered (NR; NR) **Co-intervention(s):** n/a	**Name:** C1 inactive - usual care C2 inactive control - music therapy (co-intervention) **What – materials & procedure:** C1-usual care not described C2-preferred music types delivered via MP3 players **When & how much:** C1-NR C2-30 mins pre-surgery and again after tracheal extubation (duration NR) **Who administered (provider):** C1-n/a C2-provider administered **No. arms included in synthesis (treatment & control):** 4 **Ineligible arms:** none	**Eligible outcomes:** Pain: postoperative pain intensity - early acute (VAS)* Emotional functioning/mental health: postoperative anxiety - early acute (VAS)* **Ineligible outcomes:** Physiological function, signs and symptoms: IL-6 and HMGB-1 **Timing of outcome measurement:** 30 mins before surgery, 4 hrs after tracheal extubation*
dos Reis Lucena 2021 [145-S] **Country:** Brazil **Setting (detail):** hospital - outpatient (Outpatient clinic) **Study design:** parallel group	**No. randomised (age; sex):** 35 adults (AT. 57 years, C. 56 [mean]; 100% female) **Treatment goal:** relieve symptoms of a condition (menopause) **Inclusion criteria:** Postmenopausal, $\geqslant$ 1 year of amenorrhea; Clinically diagnosed insomnia (DSM-V);	**Name:** AT - lavender (inhalation) **What – essential oil & procedure:** lavender (% NR, 0.12 mL in 2 mL sunflower oil), inhaled from a bottle, then administered on a cotton ball next to pillow **When & how much:** 2 x 2-minute inhalation nightly before bed, then overnight, for 29 days	**Name:** inactive - placebo **What – materials & procedure:** sunflower oil inhaled from a 2mL bottle, then administered on a cotton ball next to pillow **When & how much:** 2 x 2-minute inhalation nightly before bed, then overnight, for 29 days	**Eligible outcomes:** Sleep: sleep quality (PSQI total score*; PSQI subscales); sleep quality (polysomnography: e.g. sleep onset latency, total sleep time); insomnia severity (ISI) HR-QoL: overall HR-QoL (MRS total score)* **Ineligible outcomes:** Emotional functioning/mental health: anxiety and depression symptoms (HADS - total; HADS -

Study details	Population	Aromatherapy intervention arm(s)	Comparator arm(s)	Outcomes (* = selected for synthesis)
	Exclusion criteria: Obstructive sleep apnoea (Stop-bang score > 3); use of drugs that affect sleep; hormone therapy; uncontrolled chronic diseases; shift workers **ICD code:** 7A00 Chronic insomnia; GA30.0 Menopause	**Who administered (provider; AT training):** self-administered, provider prescribed (NR; NR) **Co-intervention(s):** n/a	**Who administered (provider):** self-administered, provider prescribed **No. arms included in synthesis (treatment & control):** 2 **Ineligible arms:** none	anxiety, depression subscales; MRS psychological subscale); menopausal symptoms (MRS subdomains: somato-vegetative, urogenital) **Timing of outcome measurement:** day 28 (end of AT intervention period)*
Doyle 2020 [144-S] **Country:** United States **Setting (detail):** hospital - outpatient (Community hospital) **Study design:** parallel group	**No. randomised (age; sex):** 90 adults (AT. 60 years, C. 67 [mean]; AT. 51% female, C. 49%) **Treatment goal:** relieve procedure-related side effects (image-guided biopsy) **Inclusion criteria:** Scheduled for image-guided biopsy in interventional radiology **Exclusion criteria:** n/a **ICD code:** Image-guided biopsy	**Name:** AT - lavender (topical) **What – essential oil & procedure:** lavender, chamomile, & jasmine (dilution NR, carrier: olive oil) administered by manufactured adhesive patch applied to upper arm, covered with an adhesive bandage **When & how much:** one patch, applied prior to the procedure, and remaining in place throughout the procedure **Who administered (provider; AT training):** provider administered (NR; NR) **Co-intervention(s):** n/a	**Name:** inactive - placebo **What – materials & procedure:** cotton ball soaked in jojoba oil applied to upper arm with an adhesive bandage. **When & how much:** one patch, applied prior to the procedure, and remaining in place throughout the procedure **Who administered (provider):** provider administered **No. arms included in synthesis (treatment & control):** 2 **Ineligible arms:** none	**Eligible outcomes:** Emotional functioning/mental health: preprocedural anxiety (VAS)* **Ineligible outcomes:** n/a **Timing of outcome measurement:** immediately prior to procedure (minimum 60 - 90 mins after AT intervention)*
Dunn 1995 [324-S] **Country:** United Kingdom **Setting (detail):** hospital - inpatient (ICU) **Study design:** parallel group	**No. randomised (age; sex):** 122 participants (AT. 55 years, C1. 64, C2 [mean]. 61; AT. 53% female, C1. 41%, C2. 34%) **Treatment goal:** relieve treatment-related side effects (ICU patient stress) **Inclusion criteria:** Admitted to intensive care unit **Exclusion criteria:** Head injuries **ICD code:** Intensive care	**Name:** AT - lavender (massage) **What – essential oil & procedure:** lavender (1%, carrier NR) administered via body massage according to a protocol **When & how much:** 1 - 3 sessions of 15 - 30 minutes duration within 5-day period (24 hours between sessions) **Who administered (provider; AT training):** provider administered (nurse clinically qualified; AT training) **Co-intervention(s):** n/a	**Name:** C1 - massage (co-intervention) C2 - no intervention **What – materials & procedure:** C1-grapeseed oil (undiluted, carrier n/a) administered via body massage according to a protocol C2-n/a **When & how much:** C1-1 - 3 sessions of 15 - 30 minutes duration within 5-day period (24 hours between sessions) C2-n/a **Who administered (provider):** C1-provider administered C2-n/a	**Eligible outcomes:** Emotional functioning/mental health: anxiety during hospitalisation (study specific measure - anxiety*, mood and coping domains) **Ineligible outcomes:** Physiological function, signs and symptoms: SBP, HR, RR; neurological status (unconscious patients; Glasgow coma scale); behavioural assessment (positive and negative responses based on observable behaviours: motor activity, somatic changes, facial expressions)

Study details	Population	Aromatherapy intervention arm(s)	Comparator arm(s)	Outcomes (* = selected for synthesis)
			No. arms included in synthesis (treatment & control): 3 **Ineligible arms:** none	**Timing of outcome measurement:** immediately before and after* each AT treatment (sessions 1*, 2 and 3)
Ebrahimi 2021a [142-S] **Country:** Iran **Setting (detail):** community based (Home) **Study design:** parallel group	**No. randomised (age; sex):** 183 adults (AT1. 73 years, AT2. 73, C. 74 [mean]; AT1. 59% female. AT2. 55%, C. 48%) **Treatment goal:** prevent a condition among people with risk factors (aging populations) **Inclusion criteria:** At least 65 years old **Exclusion criteria:** History of neurological and psychological disorders; receiving anxiolytics or antidepressants; narcotic addiction **ICD code:** MB24.3 Anxiety; MB24.5 Depressed mood	**Name:** AT1 - chamomile (inhalation) AT2 - lavender (inhalation) **What – essential oil & procedure:** AT1. chamomile or AT2. lavender (1.5%, carrier NR) administered on a cotton ball attached to pillow **When & how much:** 3 drops of oil, overnight for 30 consecutive nights **Who administered (provider; AT training):** self-administered, provider prescribed (research staff; NR) **Co-intervention(s):** n/a	**Name:** inactive - placebo **What – materials & procedure:** distilled water administered on cotton ball attached to pillow **When & how much:** 3 drops, overnight for 30 consecutive nights **Who administered (provider):** self-administered, provider prescribed **No. arms included in synthesis (treatment & control):** 3 **Ineligible arms:** none	**Eligible outcomes:** Emotional functioning/mental health: depression symptoms (DASS - depression domain)*, anxiety symptoms (DASS - anxiety domain), stress symptoms (DASS - stress domain) **Ineligible outcomes:** n/a **Timing of outcome measurement:** days 30* and 60 (immediately after AT intervention period and 1 month later)
Efe Arslan 2020 [141-S] **Country:** Turkey **Setting (detail):** hospital - outpatient (Haemodialysis centre) **Study design:** parallel group	**No. randomised (age; sex):** 44 adults (AT. 60 years, C. 55 [mean]; AT. 27% female, C. 36%) **Treatment goal:** relieve procedure-related side effects (haemodialysis) **Inclusion criteria:** Regular hemodialysis; Distress (> 4 on Distress Thermometer); Sleep disturbance (> 5 on PSQI) **Exclusion criteria:** n/a **ICD code:** QB94 Care involving dialysis; MG41 Sleep disturbance (significant); Moderate to severe distress	**Name:** AT - lavender (massage) **What – essential oil & procedure:** lavender (2% dilution with sweet almond oil) administered by hand massage according to a protocol **When & how much:** 1 mL oil massaged for 5 mins per hand in each dialysis session for 4 weeks (12 sessions) **Who administered (provider; AT training):** provider administered (research staff; AT training) **Co-intervention(s):** usual care as per comparator arm	**Name:** inactive - usual care **What – materials & procedure:** routine clinical practices (such as medication, care, and follow-up) **When & how much:** n/a **Who administered (provider):** n/a **No. arms included in synthesis (treatment & control):** 2 **Ineligible arms:** none	**Eligible outcomes:** Sleep: sleep quality overall (PSQI - total)* Emotional functioning/mental health: mental distress symptom severity (Distress Thermometer)* **Ineligible outcomes:** Sleep: use of sleep medication over 4 weeks **Timing of outcome measurement:** immediately after final AT session (12 weeks)*
Efe Erturk 2021 [140-S] **Country:** Turkey	**No. randomised (age; sex):** 90 adults (AT. 50 years, C. 54 [mean]; AT. 68% female, C. 68%)	**Name:** AT - peppermint (inhalation) **What – essential oil & procedure:** peppermint (3% in sweet almond	**Name:** inactive - usual care **What – materials & procedure:** take-home oral ondansetron (8 mg) and oral metoclopramide (10 mg)	**Eligible outcomes:** Nausea & vomiting: severity of nausea (VAS)*, nausea, vomiting and retching (INVR total score)

Study details	Population	Aromatherapy intervention arm(s)	Comparator arm(s)	Outcomes (* = selected for synthesis)
Setting (detail): hospital - outpatient (Chemotherapy unit; home) **Study design:** parallel group	**Treatment goal:** relieve procedure-related side effects (chemotherapy) **Inclusion criteria:** Scheduled for chemotherapy; Cancer stages I - III **Exclusion criteria:** Psychiatric disorders; COPD; hepatic and renal failure **ICD code:** 02 Neoplasms (chemotherapy)	oil), administered on philtrum, followed by a deep breath **When & how much:** 1 drop, 3 times daily for 5 days following chemotherapy **Who administered (provider; AT training):** self-administered, provider prescribed (research staff; NR) **Co-intervention(s):** usual care as per comparator arm	**When & how much:** n/a **Who administered (provider):** self-administered, provider prescribed **No. arms included in synthesis (treatment & control):** 2 **Ineligible arms:** none	**Ineligible outcomes:** n/a **Timing of outcome measurement:** evening of chemotherapy; post-chemotherapy days 1, 2, 3, 4; most severe nausea (as measured by VAS) over 5-day follow-up*
Eftekharsadat 2018 [323-S] **Country:** Iran **Setting (detail):** hospital - outpatient, community based (Physical medicine & rehabilitation clinic; home) **Study design:** parallel group	**No. randomised (age; sex):** 50 adults (AT. 50 years, C. 48 [mean]; AT. 83% female C. 88%) **Treatment goal:** relieve symptoms of a condition (carpal tunnel syndrome) **Inclusion criteria:** Mild to moderate carpal tunnel syndrome (based on clinical findings and electrodiagnostic studies) **Exclusion criteria:** Severe carpal tunnel syndrome (CTS); neuromusculoskeletal conditions of the upper limb that mimic CTS; systemic conditions associated with CTS (e.g. inflammatory arthritis); previous wrist surgery/injury or conservative treatment in last 6 months **ICD code:** 8C10.0 Carpal tunnel syndrome (mild to moderate)	**Name:** AT - lavender (topical) **What – essential oil & procedure:** lavender (1.5%, carrier: stearic acid, vaseline, and glycerin) administered topically on affected wrist. Participants also wore a neoprene wrist splint. **When & how much:** Participants applied ointment 2 x day (morning and evening) for 40 days, and also wore splint at night during this time **Who administered (provider; AT training):** self-administered, provider prescribed (medical practitioner; NR) **Co-intervention(s):** see comparator arm	**Name:** inactive - placebo **What – materials & procedure:** ointment (stearic acid, vaseline, and glycerin) administered topically on affected wrist. Participants also wore a neoprene wrist splint. **When & how much:** participants applied ointment 2 x day (morning and evening) for 40 days, and also wore splint at night during this time **Who administered (provider):** self-administered, provider prescribed **No. arms included in synthesis (treatment & control):** 2 **Ineligible arms:** none	**Eligible outcomes:** Pain: pain intensity (VAS)* Physical function: hand function (Boston Carpal Tunnel Syndrome Questionnaire (BCTQ) - functional status subscale)* **Ineligible outcomes:** Physiological function, signs and symptoms: pinch grip strength, power grip, changes in electrodiagnostic studies parameters. **Timing of outcome measurement:** end of week 4* (end of AT intervention period)
El Sayed 2020 [360-S] **Country:** Egypt **Setting (detail):** hospital - outpatient, community based (Rheumatology and rehabilitation unit; home)	**No. randomised (age; sex):** 60 adults (42 years [mean]; 83% female) **Treatment goal:** relieve symptoms of a condition (knee OA) **Inclusion criteria:** Knee osteoarthritis, confirmed diagnosis **Exclusion criteria:** n/a	**Name:** AT - lavender (massage) **What – essential oil & procedure:** lavender (3% in sweet almond oil) administered by knee massage **When & how much:** 5 mL used in 20-minute massage, 3 times per week for 3 weeks (9 sessions)	**Name:** inactive - usual care **What – materials & procedure:** conventional drugs prescribed by rheumatologists **When & how much:** n/a **Who administered (provider):** provider administered	**Eligible outcomes:** Pain: pain intensity overall (VAS)* Physical function: disability - global (Lequesne Algofunctional Index (LAI))* **Ineligible outcomes:** n/a **Timing of outcome measurement:** week 1, 2 and 3* (end of AT intervention period)

Study details	Population	Aromatherapy intervention arm(s)	Comparator arm(s)	Outcomes (* = selected for synthesis)
Study design: parallel group	**ICD code:** FA01 Osteoarthritis of knee	**Who administered (provider; AT training):** self-administered, provider prescribed (NR; NR) **Co-intervention(s):** usual care as per comparator arm	**No. arms included in synthesis (treatment & control):** 2 **Ineligible arms:** none	
Emami-Sigaroudi 2021 [058-S] **Country:** Iran **Setting (detail):** hospital - inpatient (Surgery department) **Study design:** parallel group	**No. randomised (age; sex):** 97 adults (AT1. 59 years; AT2. 58, C. 59 [mean]; AT1. 38% female, AT2. 41%, C. 36%) **Treatment goal:** relieve surgery-related side effects (CABG surgery) **Inclusion criteria:** Scheduled for CABG surgery **Exclusion criteria:** Use of antidepressants or sedative medications; history of psychological or sleep disorders **ICD code:** XA3B03 Coronary arteries disease (coronary artery bypass graft surgery)	**Name:** AT1 - damask rose (inhalation) AT2 - lavender (inhalation) **What – essential oil & procedure:** AT1. damask rose or AT2. lavender (% and carrier NR), administered as drops directly onto pillow **When & how much:** 3 drops at 22:00 for 5 consecutive nights **Who administered (provider; AT training):** self-administered, provider prescribed (NR; NR) **Co-intervention(s):** n/a	**Name:** inactive - no intervention **What – materials & procedure:** n/a **When & how much:** n/a **Who administered (provider):** n/a **No. arms included in synthesis (treatment & control):** 3 **Ineligible arms:** none	**Eligible outcomes:** Sleep: subjective sleep quality*, sleep latency, sleep duration, habitual sleep efficiency, sleep disturbances, use of sleep medications, daytime dysfunction (PSQI subdomains), sleep quality overall (PSQI - total) **Ineligible outcomes:** n/a **Timing of outcome measurement:** day 6 (morning after 5-day AT intervention)*
Evans 2018 [138-S] **Country:** USA **Setting (detail):** hospital - outpatient (Infusion centre) **Study design:** parallel group	**No. randomised (age; sex):** 49 children (age NR; AT. 45% female, C1. 26%, C2. 50%) **Treatment goal:** prevent treatment-related side effects (chemotherapy) **Inclusion criteria:** Diagnosed with cancer; Scheduled for 30-min emetogenic chemotherapy infusion **Exclusion criteria:** Daily medications for asthma **ICD code:** 02 Neoplasms (chemotherapy)	**Name:** AT - ginger (inhalation) **What – essential oil & procedure:** ginger (% and carrier n/a), on a cotton ball inside a capped specimen cup, inhaled in 3 deep breaths followed by normal breathing [all groups also received standard antiemetics, including ondansetron, dexamethasone, or granisetron as ordered by the oncology provider] **When & how much:** 4 drops inhaled immediately before and throughout the procedure [mean duration NR] **Who administered (provider; AT training):** provider administered (nurse clinically qualified; NR) **Co-intervention(s):** n/a	**Name:** C1 inactive - placebo (shampoo) C2 inactive - placebo (water) **What – materials & procedure:** C1-Johnson's baby shampoo, on a cotton ball inside a capped specimen cup, inhaled in 3 deep breaths followed by normal breathing C2-water, on a cotton ball inside a capped specimen cup, inhaled in 3 deep breaths followed by normal breathing **When & how much:** C1-4 drops inhaled immediately before and throughout the procedure [mean duration NR] C2-4 drops inhaled immediately before and throughout the procedure [mean duration NR] **Who administered (provider):** C1-provider administered C2-provider administered	**Eligible outcomes:** Nausea & vomiting: nausea - worse or no change (PeNAT; proportion with no improvement from baseline)* **Ineligible outcomes:** n/a **Timing of outcome measurement:** 15 - 30 mins after completion of chemotherapy*

Study details	Population	Aromatherapy intervention arm(s)	Comparator arm(s)	Outcomes (* = selected for synthesis)
			No. arms included in synthesis (treatment & control): 3 **Ineligible arms:** none	
Fayazi 2011 [286-S] **Country:** Iran **Setting (detail):** hospital - inpatient (Hospital) **Study design:** parallel group	**No. randomised (age; sex):** 72 adults (age NR; % female NR) **Treatment goal:** relieve surgery-related side effects (thorax & abdominal surgery) **Inclusion criteria:** Scheduled for heart or abdominal surgery; **Exclusion criteria:** Severe acute pain; use of benzodiazepines, analgesics or opioids **ICD code:** Thorax and abdominal surgery	**Name:** AT - lavender (inhalation) **What – essential oil & procedure:** lavender (undiluted, carrier n/a) administered on handkerchief **When & how much:** 2 drops inhaled for 20 minutes (time prior to surgery NR) **Who administered (provider; AT training):** NR (NR; NR) **Co-intervention(s):** n/a	**Name:** inactive - placebo **What – materials & procedure:** water administered on a handkerchief **When & how much:** 2 drops inhaled from handkerchief for 20 minutes (time prior to surgery NR) **Who administered (provider):** NR **No. arms included in synthesis (treatment & control):** 2 **Ineligible arms:** none	**Eligible outcomes:** Emotional functioning/mental health: preoperative anxiety (STAI -state)* **Ineligible outcomes:** Physiological function, signs and symptoms: SBP, DBP, PR, RR, temperature **Timing of outcome measurement:** prior to surgery (and immediately after AT intervention)*
Fazlollahpour-Rokni 2019 [100-S] **Country:** Iran **Setting (detail):** hospital - inpatient (NR) **Study design:** parallel group	**No. randomised (age; sex):** 66 adults (AT. 62 years, C. 63 years [mean]; AT. 44% female, C. 40%) **Treatment goal:** relieve surgery-related side effects (CABG surgery) **Inclusion criteria:** Scheduled for CABG surgery; Moderate to severe anxiety (STAI score 33 - 64); **Exclusion criteria:** Use of sleep medications or tranquilizers; history of anxiety disorders; drug addiction **ICD code:** XA3B03 Coronary arteries disease (coronary artery bypass graft surgery); MB24.3 Anxiety (moderate to severe)	**Name:** AT - rose (inhalation) **What – essential oil & procedure:** rose (4% in propylene glycol), applied on a 5 × 5 cm cotton cloth and attached to the patients' clothes, 20 cm from nose **When & how much:** 2 x 10 mins (the night before surgery at 9 pm and 1 hr before surgery) [Note: all patients were scheduled to consult the hospital's psychologist before surgery, helping them reduce psychological distress and anxiety] **Who administered (provider; AT training):** provider administered (; NR) **Co-intervention(s):** n/a	**Name:** inactive - no intervention **What – materials & procedure:** n/a **When & how much:** n/a **Who administered (provider):** n/a **No. arms included in synthesis (treatment & control):** 2 **Ineligible arms:** none	**Eligible outcomes:** Emotional functioning/mental health: preoperative anxiety (STAI - total, trait, state*) **Ineligible outcomes:** n/a **Timing of outcome measurement:** evening before and morning* of surgery (30 mins before and 30 mins after* each AT intervention)
Franco 2016 [137-S] **Country:** USA	**No. randomised (age; sex):** 93 adults (AT. 53 years, C. 47 [mean]; 100% female)	**Name:** AT - lavender (inhalation) **What – essential oil & procedure:** lavender (2%, carrier NR) inside an oxygen face mask per protocol	**Name:** inactive - placebo **What – materials & procedure:** blend of unscented mineral oils inside an oxygen face mask per protocol	**Eligible outcomes:** preoperative anxiety (STAI - state; analysed as positive and negative* questions)

Study details	Population	Aromatherapy intervention arm(s)	Comparator arm(s)	Outcomes (* = selected for synthesis)
Setting (detail): hospital - inpatient (Preoperative holding area) **Study design:** parallel group	**Treatment goal:** relieve surgery-related side effects (breast surgery) **Inclusion criteria:** Scheduled for elective breast surgery; Healthy, mild or severe systemic disease (ASA physical status I to III) **Exclusion criteria:** Chronic respiratory diseases **ICD code:** Breast surgery	**When & how much:** 2 drops, for 10 minutes in preoperative holding area [time before surgery NR] **Who administered (provider; AT training):** provider administered (research staff; NR) **Co-intervention(s):** n/a	**When & how much:** 2 drops, for 10 minutes in preoperative holding area [time before surgery NR] **Who administered (provider):** provider administered **No. arms included in synthesis (treatment & control):** 2 **Ineligible arms:** none	**Ineligible outcomes:** Physiological function, signs and symptoms: HR, SDP, DBP **Timing of outcome measurement:** immediately afer the AT intervention and before entering the operating theatre*
Fu 2013 [049-S] **Country:** Australia **Setting (detail):** aged care facility (LTC facilities) **Study design:** parallel group	**No. randomised (age; sex):** 45 elderly (84 years [mean], 59% female) **Treatment goal:** relieve symptoms of a condition (agitation, dementia) **Inclusion criteria:** Diagnosed with dementia with features of Alzheimer's disease; MMSE $\leqslant$ 24/30; $\geqslant$14 days of agitation or aggression in past 3 months; Documented history of physical and/or chemical restraint for agitation and aggression (inc PRN medication); Nursing home residents for $\geqslant$ 3 months **Exclusion criteria:** Schizophrenia; intellectual development disorders **ICD code:** 6D80 Dementia due to Alzheimer disease; 6D86.4 Agitation or aggression in dementia	**Name:** AT - lavender (inhalation) **What – essential oil & procedure:** lavender (3% in water), as misted spary applied towards upper chest, 20 cm away from participant **When & how much:** 3 sprays twice daily, morning and afternoon, for 6 weeks **Who administered (provider; AT training):** provider administered (research staff; NR) **Co-intervention(s):** n/a	**Name:** inactive - placebo **What – materials & procedure:** water mist, applied as misted spray towards upper chest, 20 cm away from participant **When & how much:** 3 sprays twice daily, morning and afternoon, for 6 weeks **Who administered (provider):** provider administered **No. arms included in synthesis (treatment & control):** 2 **Ineligible arms:** Hand massage + lavender (inhalation)	**Eligible outcomes:** Emotional functioning/mental health: agitation (CMAI - agitation*, aggression, nonaggression, hiding and holding things) **Ineligible outcomes:** Cognitive functioning: MMSE **Timing of outcome measurement:** weeks 2, 4, 6 (end of AT intervention period)* and 12
Gazerani 2021 [055-S] **Country:** Iran **Setting (detail):** hospital - inpatient (Operating room, recovery room) **Study design:** parallel group	**No. randomised (age; sex):** 120 adults (AT1. 23 years, AT2. 24 , C. 25 [mean]; AT1. 42% female, AT2. 51%, C. 55%) **Treatment goal:** relieve surgery-related side effects (appendectomy) **Inclusion criteria:** Scheduled for open appendectomy (< 1 hr); Healthy or mild systemic disease (ASA physical status I or II) **Exclusion criteria:** **ICD code:** Appendectomy	**Name:** AT - geranium (inhalation) **What – essential oil & procedure:** geranium (1% and carrier NR), poured on a pad and inhaled at a distance of 10cm **When & how much:** 2 x 5 mins; once before anesthesia and once after surgery **Who administered (provider; AT training):** provider administered (NR; NR)	**Name:** C1 inactive - placebo C2 inactive - no intervention **What – materials & procedure:** C1-almond (undiluted, carrier NR), poured on a pad and inhaled at a distance of 10cm C2-n/a **When & how much:** C1-2 x 5 mins; once before anesthesia and once after surgery C2-n/a	**Eligible outcomes:** Pain: postoperative pain intensity - early acute (VAS)* **Ineligible outcomes:** Physiological function, signs and symptoms: HR, SYS, DIA, SaO2 **Timing of outcome measurement:** before anesthesia, entering recovery, leaving recovery (after 2nd AT intervention)*, 4h after surgery

Study details	Population	Aromatherapy intervention arm(s)	Comparator arm(s)	Outcomes (* = selected for synthesis)
		Co-intervention(s): n/a	**Who administered (provider):** C1- provider administered C2-n/a **No. arms included in synthesis (treatment & control):** 3 **Ineligible arms:** none	
Genç 2020 [136-S] **Country:** Turkey **Setting (detail):** aged care facility (Nursing home) **Study design:** parallel group	**No. randomised (age; sex):** 59 adults (AT. 75 years, C. 72 [mean]; AT. 27% female, C. 14%) **Treatment goal:** relieve symptoms of a condition (chronic insomnia) **Inclusion criteria:** Inadequate sleep $\geqslant$ 3 months (PSQI score $\geqslant$ 5); Fatigue (FSS score $\geqslant$ 5) **Exclusion criteria:** Use of medications that affect sleep History of psychiatric problems **ICD code:** 7A00 Chronic insomnia; MG22 Fatigue	**Name:** AT - lavender (inhalation) **What – essential oil & procedure:** lavender (3%, undiluted) administered on a 2 x 2 cm cotton pad and inhaled from distance of 15 - 20 cm **When & how much:** 2 drops oil on patch placed on stand near bedside overnight (10 hours) for one month **Who administered (provider; AT training):** provider administered (aromatherapist; NR) **Co-intervention(s):** n/a	**Name:** inactive - no intervention **What – materials & procedure:** n/a **When & how much:** n/a **Who administered (provider):** n/a **No. arms included in synthesis (treatment & control):** 2 **Ineligible arms:** none	**Eligible outcomes:** Sleep: sleep quality overall (PSQI - total)*; subjective sleep quality, sleep latency, sleep duration, habitual sleep efficiency, sleep disturbances, daytime dysfunction (PSQI subdomains) Fatigue: severity of fatigue (FSS)* **Ineligible outcomes:** n/a **Timing of outcome measurement:** week 4 (end of AT intervention period)*
Ghaderi 2020 [110-S] **Country:** Iran **Setting (detail):** community based (Paediatric dental clinic) **Study design:** crossover	**No. randomised (age; sex):** 24 children (AT. 8 years, C. 8 [mean]; AT. 58% female, C. 50%) **Treatment goal:** relieve procedure-related side effects (dental Tx <18yrs) **Inclusion criteria:** Decayed lower second molars needing restorative tooth treatment; Reluctant or refusing treatment (Frankl behaviour rating III or IV); **Exclusion criteria:** Previous dental visits or dental pain Taking any medication **ICD code:** Dental treatment (children)	**Name:** AT (P1) - lavender (inhalation) AT (P2) - lavender (inhalation) **What – essential oil & procedure:** lavender (undiluted, carrier: water) administered by humidifier **When & how much:** 2 drops oil diffused in dental procedure room 30 minutes before patient arrival **Who administered (provider; AT training):** provider administered (NR; n/a) **Co-intervention(s):** usual care as per comparator arm	**Name:** C (P1) inactive - placebo C (P2) inactive - placebo **What – materials & procedure:** Water administered by humidifier (usual care included topical anaesthetic gel) **When & how much:** Water diffused in dental procedure room 30 minutes before patient arrival (anaesthetic gel applied prior to anaesthetic injection) **Who administered (provider):** provider administered **No. arms included in synthesis (treatment & control):** 4 **Ineligible arms:** none	**Eligible outcomes:** Pain: postprocedural pain intensity - early acute (face rating scale)* **Ineligible outcomes:** Physiological function, signs and symptoms: salivary cortisol, pulse rate **Timing of outcome measurement:** immediately after anaesthetic injection (postprocedural), but prior to dental procedure*
Gok Metin 2016 [134-S]	**No. randomised (age; sex):**	**Name:** AT - essential oil blend (massage)	**Name:** inactive - no intervention	**Eligible outcomes:** Pain: pain overall (VAS)*

Study details	Population	Aromatherapy intervention arm(s)	Comparator arm(s)	Outcomes (* = selected for synthesis)
Country: Turkey **Setting (detail):** community based (Home visits) **Study design:** parallel group	37 adults (54 years [mean]; AT 88% female, C. 88%) **Treatment goal:** relieve symptoms of a condition (rheumatoid arthritis) **Inclusion criteria:** Rheumatoid arthritis (for min. 1 yearr); Pain (>= 4 on 10-point VAS); fatigue (>= 4 on 9-point FSS) **Exclusion criteria:** High disease activity (> 5.1on DAS28 (max. 9.4)); currently using biological drug therapy, receiving physiotherapy or complementary therapy modalities **ICD code:** FA20 Rheumatoid arthritis	**What – essential oil & procedure:** lavender, juniper, ylang ylang and rosemary (5% dilution in 3:3:2:2 ratio, carrier: coconut oil) administered by knee massage according to a protocol **When & how much:** 3 x 15-min massage (20 drops oil) of each knee per week over 6 weeks **Who administered (provider; AT training):** provider administered (aromatherapist; AT training) **Co-intervention(s):** n/a	**What – materials & procedure:** n/a **When & how much:** n/a **Who administered (provider):** n/a **No. arms included in synthesis (treatment & control):** 2 **Ineligible arms:** reflexology	Fatigue: severity of overall fatigue (FSS)* **Ineligible outcomes:** Physiological function, signs and symptoms: disease activity (DAS28) **Timing of outcome measurement:** week 1, 2, 3, 4, 5 and 6* (within 1 hr of intervention delivery for AT group)
Gok Metin 2017 [135-S] **Country:** Turkey **Setting (detail):** hospital - outpatient (Endocrine outpatient clinic) **Study design:** parallel group	**No. randomised (age; sex):** 46 adults (AT 54 years; C. 57 [mean]; AT. 62% female, C. 88%) **Treatment goal:** relieve symptoms of a condition (diabetic polyneuropathy) **Inclusion criteria:** Diabetic neuropathy (>= 4 on 10-point DN4); **Exclusion criteria:** No other cause of neuropathic pain **ICD code:** 8C03.0 Diabetic polyneuropathy	**Name:** AT - essential oil blend (massage) **What – essential oil & procedure:** rosemary, geranium, lavender, eucalyptus, and chamomile oils (5%, carrier: coconut) administered by hand and foot massage according to a protocol **When & how much:** 5mL oil used in 30-min massage, 3 times per week over 4 weeks **Who administered (provider; AT training):** provider administered (research staff; NR) **Co-intervention(s):** n/a	**Name:** inactive - usual care **What – materials & procedure:** usual care not described **When & how much:** n/a **Who administered (provider):** n/a **No. arms included in synthesis (treatment & control):** 2 **Ineligible arms:** none	**Eligible outcomes:** Pain: neuropathic pain intensity (DN4, VAS*) HR-QoL: overall HR-QoL (NePIQoL)* **Ineligible outcomes:** n/a **Timing of outcome measurement:** week 2 and 4* (end of intervention period) [for AT massage group only, outcomes also measured after every intervention]
Goli 2020 [104-S] **Country:** Iran **Setting (detail):** hospital - inpatient (NR)	**No. randomised (age; sex):** 100 adults (AT. 24 years, C. 22 [mean]; AT. 46% female, C. 42%) **Treatment goal:** relieve surgery-related side effects (inguinal hernia) **Inclusion criteria:** Scheduled for inguinal hernia repair	**Name:** AT - geranium (inhalation) **What – essential oil & procedure:** geranium (% and carrier n/a), administered on a cotton ball and attached to collar **When & how much:** 5 drops (0.3 mL), 1 x 30min, 1 hr before surgery	**Name:** inactive - no intervention **What – materials & procedure:** n/a **When & how much:** bed rest for 1 hr before surgery **Who administered (provider):** n/a	**Eligible outcomes:** Emotional functioning/mental health: preoperative anxiety (STAI - overall, trait and state subscales*) **Ineligible outcomes:** n/a

Study details	Population	Aromatherapy intervention arm(s)	Comparator arm(s)	Outcomes (* = selected for synthesis)
Study design: parallel group	**Exclusion criteria:** Mood disorders; diabetes or cardiovascular diseases; using sedatives, painkillers or anxiolytic medications in past month; chronic anxiety **ICD code:** DD51 Inguinal hernia (surgery)	**Who administered (provider; AT training):** provider administered (research staff; AT training) **Co-intervention(s):** n/a	**No. arms included in synthesis (treatment & control):** 2 **Ineligible arms:** music therapy	**Timing of outcome measurement:** 30 mins before surgery (immediately after AT intervention)*
Graham 2003 [133-S] **Country:** Australia **Setting (detail):** hospital - inpatient (Cancer care centre) **Study design:** parallel group	**No. randomised (age; sex):** ~204 adults (65 years [mean], 48% female) **Treatment goal:** relieve procedure-related side effects (radiotherapy) **Inclusion criteria:** Scheduled for radiotherapy (⩾ 8 fractions prescribed) **Exclusion criteria:** Use of aromatherapy outside study **ICD code:** 02 Neoplasms (radiotherapy)	**Name:** AT - essential oil blend (inhalation) **What – essential oil & procedure:** lavender, bergamot, cedarwood (ratio 2:1:1, undiluted, carrier n/a), administered on plastic-backed paper bibs **When & how much:** a few drops, during radiotherapy treatment (treatment duration ~15 - 20 minutes; mean no. treatments = 21) **Who administered (provider; AT training):** provider administered (research staff; NR) **Co-intervention(s):** n/a	**Name:** inactive - placebo **What – materials & procedure:** sweet almond oil administered on plastic-backed paper bibs **When & how much:** a few drops, during radiotherapy treatment (treatment duration ~15 - 20 minutes; mean no. treatments = 21) **Who administered (provider):** provider administered **No. arms included in synthesis (treatment & control):** 2 **Ineligible arms:** fractionated low-grade essential oils in carrier oil with (1:2 blend)	**Eligible outcomes:** Emotional functioning/mental health: mental distress - anxiety (HADS - anxiety subscale*); mental distress - depression (HADS - depression subscale); mental distress anxiety and depression (SPHERE - anxiety and depression subscale) Fatigue: frequency of fatigue symptoms (SPHERE - fatigue subscale)* **Ineligible outcomes:** n/a **Timing of outcome measurement:** treatment completion* (duration NR; AT concurrent with radiotherapy and participants were eligible if prescribed 8 or more fractions of radiotherapy; mean no. treatment fractions = 21)
Habibzadeh 2020 [091-S] **Country:** Iran **Setting (detail):** hospital - outpatient (Haemodialysis centres) **Study design:** parallel group	**No. randomised (age; sex):** 90 adults (55 years [mean]; 100% male) **Treatment goal:** relieve treatment-related side effects (haemodialysis) **Inclusion criteria:** Undergoing haemodialysis for chronic renal failure (CRF); History of at least 6 months on haemodialysis; Dialysis sessions at least 3 times per week **Exclusion criteria:** Use of sedative, analgesic or regenerative drugs; kidney transplantation during the study; onset of other illnesses **ICD code:** QB94 Care involving dialysis; GB61 Chronic kidney disease	**Name:** AT - chamomile (massage) **What – essential oil & procedure:** chamomile (diluted in sesame oil, % NR) administered by foot massage **When & how much:** 3 mL of oil massaged for 20 minutes (10 minutes each foot) after first hour of haemodialysis, 3 times per week for 2 months (24 sessions) **Who administered (provider; AT training):** provider administered (research staff; NR) **Co-intervention(s):** n/a	**Name:** C1 inactive control - massage (co-intervention) C2 inactive - no intervention **What – materials & procedure:** C1-almond oil (undiluted) administered by foot massage C2-n/a **When & how much:** C1-3 mL of oil massaged for 20 minutes (10 minutes each foot) after first hour of haemodialysis, 3 times per week for 2 months (24 sessions) C2-n/a **Who administered (provider):** C1-provider administered	**Eligible outcomes:** Fatigue: fatigue severity overall (FSS)* HR-QoL: overall HR-QoL (KDQOL-SF - total score)* **Ineligible outcomes:** n/a **Timing of outcome measurement:** 2 months (end of AT intervention period)*

Study details	Population	Aromatherapy intervention arm(s)	Comparator arm(s)	Outcomes (* = selected for synthesis)
			C2-n/a **No. arms included in synthesis (treatment & control):** 3 **Ineligible arms:** dry massage	
Hadi 2011 [132-S] **Country:** Iran **Setting (detail):** hospital - inpatient (Labour ward) **Study design:** parallel group	**No. randomised (age; sex):** 200 participants (AT. 25 years, C. 25 [mean]; 100% female) **Treatment goal:** relieve surgery-related side effects (caesarean section) **Inclusion criteria:** Scheduled for elective caesarean **Exclusion criteria:** Post-caesarean complications **ICD code:** JB22.0 Delivery by elective caesarean section	**Name:** AT - lavender (inhalation) **What – essential oil & procedure:** lavender (2%, carrier NR) administered on a cotton swab inside oxygen mask **When & how much:** 2 drops for 3 mins, 6-8 hrs post-surgery and min. 3 hrs after analgesia, repeated 8 and 16 hrs later **Who administered (provider; AT training):** provider administered (NR; NR) **Co-intervention(s):** n/a	**Name:** inactive - placebo **What – materials & procedure:** oxygen via face mask **When & how much:** 3 mins, 6-8 hrs post-surgery and min. 3 hrs after analgesia, repeated 8 and 16 hrs later **Who administered (provider):** provider administered **No. arms included in synthesis (treatment & control):** 2 **Ineligible arms:** none	**Eligible outcomes:** Pain: postoperative pain intensity - acute [20 hrs] (VAS)* **Ineligible outcomes:** n/a **Timing of outcome measurement:** 3.5, 12, 20* hrs post IV analgesia
Hajibagheri 2014 [131-S] **Country:** Iran **Setting (detail):** hospital - inpatient (Coronary care unit) **Study design:** parallel group	**No. randomised (age; sex):** 60 participants (AT. 61 years, C. 64 [mean]; AT. 47% female, C. 70%) **Treatment goal:** relieve treatment-related side effects (CVD inpatient stress) **Inclusion criteria:** Hospitalised in CCU (cardiac ejection fraction of at least 40%) **Exclusion criteria:** Self-reported sleep disorders; sleep-disturbing diseases (eg rheumatoid arthritis, migraine); decreased consciousness; cardiac arrest; medical treatment during sleeping hours (22:00 - 06:00); use of over-the-counter tranquilizers or hypnotic-sedative agents **ICD code:** Cardiac patients	**Name:** AT - rose (inhalation) **What – essential oil & procedure:** rose (dilution and carrier NR) administered on a piece of paper towel attached to the side of the pillow. **When & how much:** 3 drops for eight hours each night (22:00 - 06:00), for 3 consecutive nights (nights 2-4 of hospitalisation) **Who administered (provider; AT training):** provider administered (NR; NR) **Co-intervention(s):** usual care as per comparator arm	**Name:** inactive - usual care **What – materials & procedure:** reduced noise, decreased indoor lighting level, nursing care during daytime to avoid interrupting patients' sleep **When & how much:** n/a **Who administered (provider):** provider administered **No. arms included in synthesis (treatment & control):** 2 **Ineligible arms:** none	**Eligible outcomes:** Sleep: subjective sleep quality*, sleep latency, sleep duration, habitual sleep efficiency, sleep disturbances, use of sleep medications, daytime dysfunction (PSQI subdomains), sleep quality overall (PSQI - total) **Ineligible outcomes:** n/a **Timing of outcome measurement:** morning of day 4 (after 3-day AT intervention period)*
Hamdamian 2018 [356-S]	**No. randomised (age; sex):**	**Name:** AT - rose (inhalation)	**Name:** inactive - placebo	**Eligible outcomes:** Pain: pain intensity (NPRS)*

Study details	Population	Aromatherapy intervention arm(s)	Comparator arm(s)	Outcomes (* = selected for synthesis)
Country: Iran **Setting (detail):** hospital - inpatient (Labour ward) **Study design:** parallel group	116 adults (AT. 26 years, C. 26 [mean]; 100% female) **Treatment goal:** relieve symptoms of a condition (labour, first stage) **Inclusion criteria:** Primiparous term pregnancy (first stage labour) **Exclusion criteria:** Severe pain **ICD code:** Labour, first stage	**What – essential oil & procedure:** rose (2% dilution with sesame oil) administered on a 10 x 10 cm cotton gauze pad attached to the collar area **When & how much:** 2 drops (0.8 ml) every 30 mins from 4 cm cervical dilation until childbirth **Who administered (provider; AT training):** provider administered (NR; NR) **Co-intervention(s):** n/a	**What – materials & procedure:** saline administered on a 10 x 10 cm cotton gauze pad attached to collar area **When & how much:** 2 drops (0.8 ml) every 30 mins from 4 cm cervical dilation until childbirth **Who administered (provider):** provider administered **No. arms included in synthesis (treatment & control):** 2 **Ineligible arms:** none	Emotional functioning/mental health: anxiety during labour (STAI - state)* **Ineligible outcomes:** 'Other' pregnancy, puerperium and perinatal outcomes: labour characteristics; Apgar scores (1 and 5 mins); mode of delivery **Timing of outcome measurement:** 4 - 5 cm, 6 - 7 cm, 8 - 10 cm* cervical dilation
Han 2006 [284-S] **Country:** South Korea **Setting (detail):** (Treatment room) **Study design:** parallel group	**No. randomised (age; sex):** 67 adults (AT. 20 years, C1. 20, C2. 21 [median]; 100% female) **Treatment goal:** relieve symptoms of a condition (dysmenorrhea) **Inclusion criteria:** Dysmenorrhea; Menstrual cramp pain > 6 (10-pt VAS) **Exclusion criteria:** Myoma; fibrocystadenoma **ICD code:** GA34.3 Dysmenorrhoea	**Name:** AT - essential oil blend (massage) **What – essential oil & procedure:** lavender, clary sage, rose (2:1:1 ratio, combined concentration of 3% in almond oil) administered by abdominal massage according to a protocol, with participants on heated beds **When & how much:** 1 x 15-minute massage daily for 7 days before menstruation and including 1st day of menstruation (1 cycle only) **Who administered (provider; AT training):** provider administered (massage therapist; NR) **Co-intervention(s):** n/a	**Name:** C2 inactive - no intervention C1 inactive - massage (co-intervention) **What – materials & procedure:** C2-n/a C1-almond oil (undiluted, carrier n/a) administered by abdominal massage according to a protocol, with participants on heated beds **When & how much:** C2-n/a C1-1 x 15-minute massage daily for 7 days before menstruation and including 1st day of menstruation (1 cycle only) **Who administered (provider):** C2-n/a C1-provider administered **No. arms included in synthesis (treatment & control):** 3 **Ineligible arms:** none	**Eligible outcomes:** Pain: pain intensity (menstrual cramps; VAS)*; dysmenorrhea severity (graded by: pain intensity, analgesics, systemic symptoms, impact on activites) **Ineligible outcomes:** n/a **Timing of outcome measurement:** days 8 (end of AT intervention period)* and 9 (day after end of AT intervention period)
Hasanzadeh 2016 [281-S] **Country:** Iran **Setting (detail):** hospital - inpatient (Cardiac surgery intensive care unit)	**No. randomised (age; sex):** 80 adults (54 years [mean]; 44% female) **Treatment goal:** relieve procedure-related side effects (chest tube removal) **Inclusion criteria:** Chest tube for at least 24 hours after cardiothoracic surgery (in ICU); First-time cardiac surgery and chest tube removal;	**Name:** AT1 - lavender (inhalation) AT2 - lavender (inhalation) + cold **What – essential oil & procedure:** AT1/AT2. lavender (undiluted, carrier n/a) administered on cotton 10 cm from the nose AT2. + cold (see co-intervention comparator arm)	**Name:** C1 inactive control - cold (co-intervention) C2 inactive - usual care **What – materials & procedure:** C1-cooling gel packs (14 cm x 18 cm) covered in gauze and applied to chest tube removal site C2-usual care not described; analgesics administered as required	**Eligible outcomes:** Pain: postprocedural pain intensity - immediate (VAS*, McGill Pain Questionnaire [SFM-MPQ]) Emotional functioning/mental health: postprocedural anxiety - immediate (STAI - state)** **Ineligible outcomes:** n/a

Study details	Population	Aromatherapy intervention arm(s)	Comparator arm(s)	Outcomes (* = selected for synthesis)
Study design: parallel group	**Exclusion criteria:** Mechanical ventilation support; continuous infusion of sedatives and analgesics or opioid analgesics less than 4 hours before the intervention **ICD code:** Chest tube removal (post cardiothoracic surgery)	**When & how much:** 1 - 2 drops inhaled for 20 minutes prior to procedure **Who administered (provider; AT training):** provider administered (NR; NR) **Co-intervention(s):** n/a	**When & how much:** C1-cooling pack in place until skin temperature reached 13 degrees C, immediately prior to procedure C2-n/a **Who administered (provider):** C1-provider administered C2-n/a **No. arms included in synthesis (treatment & control):** 4 **Ineligible arms:** none	**Timing of outcome measurement:** immediately*, 5, 10 and 15 mins post-procedure immediately** and 10 mins post-procedure
Hassanzadeh 2018 [050-S] **Country:** Iran **Setting (detail):** hospital - outpatient, community based (Haemodialysis unit; home) **Study design:** parallel group	**No. randomised (age; sex):** 70 adults (AT. 41 years, C. 44 [mean]; AT. 54% female, C. 31%) **Treatment goal:** relieve procedure-related side effects (haemodialysis) **Inclusion criteria:** Undergoing hemodialysis for $\geqslant$ 12 weeks (3 sessions/week); Fatigue (BFI score $\geqslant$ 4) **Exclusion criteria:** History of major surgery within 6 months; neuro-muscular disorders; mental disorders; kidney transplant and peritoneal dialysis; use of sedatives **ICD code:** QB94 Care involving dialysis; MG22 Fatigue	**Name:** AT - lavender (inhalation) **What – essential oil & procedure:** lavender (5% in sweet almond oil), administered on a cotton ball and attached to collar **When & how much:** 2 drops, 15 - 20 mins twice daily (once in the morning after waking (or during dialysis) and once at night before bed) x 4 weeks **Who administered (provider; AT training):** self-administered, provider prescribed (NR; NR) **Co-intervention(s):** n/a	**Name:** inactive - usual care **What – materials & procedure:** usual care not described **When & how much:** n/a **Who administered (provider):** n/a **No. arms included in synthesis (treatment & control):** 2 **Ineligible arms:** Benson muscle relaxation technique	**Eligible outcomes:** Fatigue: fatigue severity overall (BFI)* **Ineligible outcomes:** n/a **Timing of outcome measurement:** end of week 4* (end of AT intervention period)
Hawkins 2019 [353-S] **Country:** United States **Setting (detail):** hospital - outpatient (Paediatric clinic) **Study design:** parallel group	**No. randomised (age; sex):** 25 children (8.54 years [mean]; 24% female) **Treatment goal:** relieve symptoms of a condition (paediatrician visit) **Inclusion criteria:** ASD diagnosis; Scheduled for paediatric appointment; **Exclusion criteria:** n/a **ICD code:** 6A02 Autism spectrum disorder (paediatrician visit)	**Name:** AT - bergamot (inhalation) **What – essential oil & procedure:** bergamot (undiluted, carrier n/a) administered by inhalation from disposable scent strips **When & how much:** 5 drops of oil inhaled in waiting room for 15 minutes prior to appointment **Who administered (provider; AT training):** provider administered (medical practitioner; NR)	**Name:** inactive - no intervention **What – materials & procedure:** n/a **When & how much:** n/a **Who administered (provider):** n/a **No. arms included in synthesis (treatment & control):** 2 **Ineligible arms:** none	**Eligible outcomes:** Emotional functioning/mental health: preprocedural anxiety (STAI-CH: state [total]*, state ['absence of anxiety' questions]) **Ineligible outcomes:** Physiological function, signs and symptoms: SBP, DBP, HR **Timing of outcome measurement:** in waiting room prior to paediatrician checkup (and immediately after AT intervention)*

Study details	Population	Aromatherapy intervention arm(s)	Comparator arm(s)	Outcomes (* = selected for synthesis)
		Co-intervention(s): n/a		
Hawkins 2020 [119-S] **Country:** USA **Setting (detail):** community based (Home) **Study design:** parallel group	**No. randomised (age; sex):** 69 adults (AT. 45 years [mean], C. 44; 100% female) **Treatment goal:** relieve symptoms of a condition (hypothyroidism) **Inclusion criteria:** Hypothyroidism (clinically diagnosed) **Exclusion criteria:** History of thyroid cancer **ICD code:** 5A00 Hypothyroidism	**Name:** AT - essential oil blend (inhalation) **What – essential oil & procedure:** peppermint, black pepper, clove bud, white grapefruit, bergamot (undiluted blend, composition NR), placed on a paper inhaler stick and inhaled ~30 cm from body **When & how much:** 3 drops, once daily for 15 minutes (between 1 - 3 pm) for 14 consecutive days **Who administered (provider; AT training):** self-administered, provider prescribed (NR; NR) **Co-intervention(s):** n/a	**Name:** inactive - placebo **What – materials & procedure:** avocado vegetable oil (undiluted, carrier n/a), placed on a paper inhaler stick and inhaled ~30 cm from body **When & how much:** 3 drops, once daily for 15 minutes (between 1 - 3 pm) for 14 consecutive days **Who administered (provider):** self-administered, self-prescribed **No. arms included in synthesis (treatment & control):** 2 **Ineligible arms:** none	**Eligible outcomes:** Fatigue: fatigue severity overall (MFSI - global*, somatic, affective, behavioural, cognitive, general, physical, emotional, mental, vigor subscales) **Ineligible outcomes:** n/a **Timing of outcome measurement:** days 7 and 14* (end of AT intervention period)
Heidari Gorji 2015 [079-S] **Country:** Iran **Setting (detail):** hospital - inpatient (Heart surgery unit) **Study design:** parallel group	**No. randomised (age; sex):** 50 adults (AT. 63 years, C. 60 [mean]; AT. 48% female, C. 52%) **Treatment goal:** relieve surgery-related side effects (CABG surgery) **Inclusion criteria:** Scheduled for first CABG surgery **Exclusion criteria:** Tranquillizer or narcotic use within four hours of AT intervention; intubation period >24 hours **ICD code:** XA3B03 Coronary arteries disease (coronary artery bypass graft surgery)	**Name:** AT - lavender (inhalation) **What – essential oil & procedure:** lavender (2%, carrier: olive oil) administered with oxygen via a breathing face mask **When & how much:** 2 drops of oil for 15 mins, once on day 2 after surgery (4 hrs after last dose of painkiller) **Who administered (provider; AT training):** provider administered (NR; NR) **Co-intervention(s):** n/a	**Name:** inactive - placebo **What – materials & procedure:** oxygen via a breathing face mask **When & how much:** oxygen for 15 mins, once on day 2 after surgery (4 hrs after last dose of painkiller) **Who administered (provider):** provider administered **No. arms included in synthesis (treatment & control):** 2 **Ineligible arms:** none	**Eligible outcomes:** Pain: postoperative pain intensity - late acute [48 hrs] (VAS)* **Ineligible outcomes:** n/a **Timing of outcome measurement:** 5*, 30, 60 mins post-intervention on day 2 after surgery
Hekmatpou 2017.1 [186-S] **Country:** Iran **Setting (detail):** hospital - emergency (Emergency ward)	**No. randomised (age; sex):** 60 adults (32 years [mean]; 33% female) **Treatment goal:** relieve treatment-related side effects (ED care, fracture)	**Name:** AT - orange (inhalation) **What – essential oil & procedure:** orange (dilution: NR, carrier: n/a) administered on pad attached to collar area	**Name:** inactive - usual care **What – materials & procedure:** standard pain medications as prescribed by doctors **When & how much:** n/a	**Eligible outcomes:** Pain: pain intensity (VAS)* [Hekmatpou 2017.1] Emotional functioning/mental health: anxiety during hospitalisation (STAI - state)** [Hekmatpou 2017.2]

Study details	Population	Aromatherapy intervention arm(s)	Comparator arm(s)	Outcomes (* = selected for synthesis)
Study design: parallel group	**Inclusion criteria:** Emergency ward patients with fractured limbs requiring orthopaedic surgery **Exclusion criteria:** History of chronic pain or mental disorders **ICD code:** ND56.2 Fracture of unspecified body region (emergency room)	**When & how much:** 4 drops oil on pad (replaced every hour) for minimum 6 hours **Who administered (provider; AT training):** provider administered (NR; NR) **Co-intervention(s):** usual care as per comparator arm	**Who administered (provider):** n/a **No. arms included in synthesis (treatment & control):** 2 **Ineligible arms:** none	**Ineligible outcomes:** Physiological function, signs and symptoms: SBP, DBP, HR, RR, temperature **Timing of outcome measurement:** Pain: hours 1, 2, 3, 4*, 5 and 6 (of AT intervention period) [note: hours 5 and 6 not reported; hour 6 is our preferred timepoint] EF/MH: hour 6** (end of AT intervention period)
Heydarirad 2019 [098-S] **Country:** Iran **Setting (detail):** community based (Home) **Study design:** parallel group	**No. randomised (age; sex):** 54 adults (AT1. 48 years, AT2. 50, C. 50 [mean]; AT1. 80% female, AT2. 60%, C. 47%) **Treatment goal:** relieve symptoms of a condition (any cancer) **Inclusion criteria:** Any cancer diagnosis; Self-reported unsatisfactory sleep quality **Exclusion criteria:** n/a **ICD code:** 02 Neoplasms with self-reported sleep disturbance	**Name:** AT1 - rose (inhalation, 5%) AT2 - rose (inhalation, 10%) **What – essential oil & procedure:** AT1. rose (5%) or AT2. rose (10%) in rapeseed oil and paraffin), placed on a cotton ball, inhaled 4 - 5cm from nose **When & how much:** 5 drops, 20 min nightly before bed x 14 days **Who administered (provider; AT training):** self-administered, provider prescribed (NR; NR) **Co-intervention(s):** n/a	**Name:** inactive - no intervention **What – materials & procedure:** n/a **When & how much:** n/a **Who administered (provider):** n/a **No. arms included in synthesis (treatment & control):** 3 **Ineligible arms:** none	**Eligible outcomes:** Sleep: sleep quality overall (PSQI - total)*, subjective sleep quality, sleep latency, sleep duration (PSQI subscales) **Ineligible outcomes:** n/a **Timing of outcome measurement:** end of 2-week AT intervention*
Hodge 2014 [279-S] **Country:** United States **Setting (detail):** hospital - inpatient (Postoperative inpatient unit) **Study design:** parallel group	**No. randomised (age; sex):** 121 adults (age and gender NR) **Treatment goal:** relieve surgery-related side effects (PONV) **Inclusion criteria:** Patients reporting PONV within 24 hours after surgery **Exclusion criteria:** n/a **ICD code:** MD90 Nausea or vomiting (postoperative)	**Name:** AT - essential oil blend (inhalation) **What – essential oil & procedure:** lavender, peppermint, ginger, and spearmint blend (% and carrier NR) administered via QueaseEase container **When & how much:** one container for a few deep breaths (container dosage NR) on first episode of nausea	**Name:** inactive - placebo **What – materials & procedure:** unscented inhaler identical to QueaseEase **When & how much:** one container for a few deep breaths (container dosage NR) on first episode of nausea **Who administered (provider):** provider administered **No. arms included in synthesis (treatment & control):** 2 **Ineligible arms:** none	**Eligible outcomes:** Nausea & vomiting: postoperative nausea severity (10-point scale - likely to be an NRS but NR; time NR)* **Ineligible outcomes:** n/a **Timing of outcome measurement:** after first postoperative episode of nausea (and 3 mins after AT intervention)*

Study details	Population	Aromatherapy intervention arm(s)	Comparator arm(s)	Outcomes (* = selected for synthesis)
		Who administered (provider; AT training): provider administered (nurse clinically qualified; NR) **Co-intervention(s):** n/a		
Hozumi 2017 [277-S] **Country:** Japan **Setting (detail):** hospital - inpatient (Hospital) **Study design:** parallel group	**No. randomised (age; sex):** 364 adults (AT1. 46 years, AT2. 44, AT3. 46, C1. 46, C2. 46 [mean]; 0% female) **Treatment goal:** relieve procedure-related side effects (colonoscopy) **Inclusion criteria:** Scheduled for colonoscopy **Exclusion criteria:** Female; contraindicated diseases for antispastic agents **ICD code:** Non-sedative colonoscopy	**Name:** AT1 - grapefruit (inhalation) AT2 - lavender (inhalation) AT3 - sweet osmanthus (inhalation) **What – essential oil & procedure:** AT1. grapefruit (0.3 mL) or AT2. lavender (0.05 mL) or AT3. sweet osmanthus (0.05 mL) in 70 mL tap water diffused using a commercial aroma diffuser, placed near patient's head on examination table **When & how much:** throughout the procedure (mean exposure time NR) **Who administered (provider; AT training):** provider administered (NR; NR) **Co-intervention(s):** usual care as per comparator arm	**Name:** C1 inactive - usual care C2 inactive - placebo **What – materials & procedure:** C1-10 mg IM scopolamine butylbromide injection C2-tap water (70 mL) diffused using a commercial aroma diffuser, placed near patient's head on examination table **When & how much:** C1-n/a C2-throughout the procedure (mean exposure time NR) **Who administered (provider):** C1-provider administered C2-provider administered **No. arms included in synthesis (treatment & control):** 5 **Ineligible arms:** none	**Eligible outcomes:** Pain: periprocedural pain intensity (NRS)* Emotional functioning/mental health: periprocedural anxiety (NRS)* **Ineligible outcomes:** n/a **Timing of outcome measurement:** immediately after the procedure (recall = during the procedure)*
Hu 2010 [276-S] **Country:** Taiwan **Setting (detail):** hospital - inpatient (Hospital) **Study design:** parallel group	**No. randomised (age; sex):** 27 adults (52 years [mean]; AT. 36% female, C. 54%) **Treatment goal:** relieve procedure-related side effects (colonoscopy) **Inclusion criteria:** Scheduled for colonoscopy **Exclusion criteria:** Mental disorders **ICD code:** Colonoscopy	**Name:** AT - neroli oil (inhalation) **What – essential oil & procedure:** neroli oil (% NR; carrier: n/a), applied in nebuliser and inhaled via oxygen mask **When & how much:** 1 drop, 5 minutes before procedure **Who administered (provider; AT training):** provider administered (NR; NR) **Co-intervention(s):** n/a	**Name:** inactive - placebo **What – materials & procedure:** sunflower oil (% and carrier n/a) applied in nebuliser and inhaled via oxygen mask **When & how much:** 1 drop, 5 minutes before procedure **Who administered (provider):** provider administered **No. arms included in synthesis (treatment & control):** 2 **Ineligible arms:** none	**Eligible outcomes:** Pain: postprocedural pain intensity - early acute (VAS)* Emotional functioning/mental health: postprocedural anxiety - immediate (STAI - state)* **Ineligible outcomes:** Physiological function, signs and symptoms: SBP, DBP, HR, RR **Timing of outcome measurement:** after the procedure (time period NR)*
Hunt 2013 [275-S]	**No. randomised (age; sex):**	**Name:** AT1 - essential oil blend (inhalation)	**Name:** inactive - placebo	**Eligible outcomes:**

Study details	Population	Aromatherapy intervention arm(s)	Comparator arm(s)	Outcomes (* = selected for synthesis)
Country: United States **Setting (detail):** day surgery (Postanaesthesia care unit) **Study design:** parallel group	225 adults (AT1. 41 years, AT2. 43, C. 41 [mean]; AT1. 89% female, AT 2. 93%, C. 95%) **Treatment goal:** relieve surgery-related side effects (PONV) **Inclusion criteria:** Having surgery that day; Experiencing postoperative nausea **Exclusion criteria:** On blood thinning medication; history of clotting disorders **ICD code:** MD90 Nausea or vomiting (postoperative)	AT2 - ginger (inhalation) **What – essential oil & procedure:** AT1. ginger, spearmint, peppermint and cardamom or AT2. ginger (% and carrier: NR) administered on a 5 x 5 cm gauze pad held under the nose **When & how much:** 1 mL inhaled in three deep breaths after arrival into PACU and on experiencing PONV **Who administered (provider; AT training):** provider administered (nurse clinically qualified; NR) **Co-intervention(s):** n/a	**What – materials & procedure:** normal saline administered on a 2 x 2 cm gauze pad held under the nose **When & how much:** 1 mL inhaled in three deep breaths after arrival into PACU and on experiencing PONV **Who administered (provider):** provider administered **No. arms included in synthesis (treatment & control):** 3 **Ineligible arms:** 70% isopropyl alcohol	Nausea & vomiting: early postoperative nausea (VRS; proportion with worse nausea or unchanged from baseline*; time from surgery NR); early postoperative vomiting (number of episodes; time from surgery NR); rescue antiemetic medication (proportion of patients requesting) **Ineligible outcomes:** n/a **Timing of outcome measurement:** 5 minutes after AT treatment* (time from end of surgery not reported); unclear timeframe for vomiting and rescue antiemetics
Hur 2019 [274-S] **Country:** South Korea **Setting (detail):** community based (Home) **Study design:** parallel group	**No. randomised (age; sex):** 65 adults (AT. 50 years, C. 51 [mean]; 100% female) **Treatment goal:** relieve symptoms of a condition (intermediate hyperglycaemia) **Inclusion criteria:** Pre-diabetic (fasting glucose 100-126mg/dL or HbA1c 5.5 - 6.4%) **Exclusion criteria:** Use of medications affecting sleep and fatigue; diabetes diagnosis; currently on oral diabetes medication and insulin injections **ICD code:** 5A40 Intermediate hyperglycaemia	**Name:** AT - essential oil blend (inhalation and massage) **What – essential oil & procedure:** lavender, geranium, cinnamon, grapefruit, neroli, ylang ylang (undiluted for inhalation; 3% in almond oil for massage). For inhalation: 1mL placed in a necklace for wearing. For massage: 20 drops administered via abdominal massage according to a protocol. **When & how much:** participants wore aroma necklace throughout the intervention period (refilled if required) and performed 1 x 20-minute massage daily for 2 weeks **Who administered (provider; AT training):** self-administered, provider prescribed (research staff; NR) **Co-intervention(s):** n/a	**Name:** inactive - no intervention **What – materials & procedure:** n/a **When & how much:** n/a **Who administered (provider):** n/a **No. arms included in synthesis (treatment & control):** 2 **Ineligible arms:** none	**Eligible outcomes:** Fatigue: severity of fatigue overall (NRS)* **Ineligible outcomes:** Emotional functioning/mental health: subjective stress level (NRS); Sleep: sleep quality (VSH - overall); Physiological function, signs and symptoms: objective stress level (index measured with autonomic nervous system monitor); average blood glucose levels (fructosamine as indicator) **Timing of outcome measurement:** weeks 1 and 2* (immediately after end of AT intervention period)
Izgu 2019a [272-S]	**No. randomised (age; sex):**	**Name:** AT - essential oil blend (massage)	**Name:** inactive - no intervention	**Eligible outcomes:**

Study details	Population	Aromatherapy intervention arm(s)	Comparator arm(s)	Outcomes (* = selected for synthesis)
Country: Turkey **Setting (detail):** hospital - outpatient, community based (Chemotherapy unit; home) **Study design:** parallel group	46 adults (AT. 57 years; C. 55 [mean]; AT. 46% female, C. 38%) **Treatment goal:** relieve treatment-related side effects (chemotherapy) **Inclusion criteria:** Receiving FOLFOX6 chemotherapy for (primarily) colon cancer; Paresthesia pain (NRS ⩾ 1); Platelet count > 00000/2L **Exclusion criteria:** Brain metastases; deep vein thrombosis; history of peripheral neuropathy; use of medication to prevent or treat neuropathy during the study period **ICD code:** 2B93 Malignant neoplasms of large intestine, site unspecified	**What – essential oil & procedure:** peppermint, chamomile & rosemary (1.5% in coconut oil), administered by hand and foot massage according to a protocol **When & how much:** 3 x ~40 minutes per week, with 1 - 2 rest days between sessions, for 6 weeks (total of 18 sessions) **Who administered (provider; AT training):** provider administered (research staff; AT training) **Co-intervention(s):** n/a	**What – materials & procedure:** n/a **When & how much:** n/a **Who administered (provider):** n/a **No. arms included in synthesis (treatment & control):** 2 **Ineligible arms:** none	Pain: neuropathic pain intensity (NRS)*; neuropathic pain symptoms (DN4) Fatigue: fatigue severity (PFS)* **Ineligible outcomes:** n/a **Timing of outcome measurement:** weeks 2 and 4 of intervention; week 6 (end of intervention period)*; week 8 (2 weeks after end of intervention period)
Izgu 2020 [271-S] **Country:** Turkey **Setting (detail):** hospital - inpatient (Stem cell transplantation units) **Study design:** parallel group	**No. randomised (age; sex):** 70 adults (AT. 53 years, C. 55 [mean]; AT. 29% female, C. 40%) **Treatment goal:** relieve treatment-related side effects (stem cell transplantation) **Inclusion criteria:** Scheduled for first-time autologous hematopoietic stem cell transplantation **Exclusion criteria:** Persistent nausea and vomiting due to conditioning regimens; receiving other antiemetics; any mental disorders or dementia **ICD code:** 02 Neoplasms (autologous hematopoietic stem cell transplantation)	**Name:** AT - orange (inhalation) **What – essential oil & procedure:** orange (undiluted, carrier n/a), administered on cotton gauze and placed on the chest **When & how much:** 6 drops inhaled for the duration of the procedure (10 - 30 minutes) **Who administered (provider; AT training):** provider administered (research staff; AT training) **Co-intervention(s):** usual care as per comparator arm	**Name:** inactive - usual care **What – materials & procedure:** routine medical care **When & how much:** n/a **Who administered (provider):** n/a **No. arms included in synthesis (treatment & control):** 2 **Ineligible arms:** none	**Eligible outcomes:** Nausea & vomiting: vomiting* and dry retching during procedure (no. of episodes); nausea severity (VAS) Emotional functioning/mental health: postprocedural anxiety - immediate (STAI - state)* **Ineligible outcomes:** n/a **Timing of outcome measurement:** Nausea & vomiting: at beginning of each new infusion bag; immediately after completion of last infusion bag* Emotional functioning/mental health: immediately after completion of last infusion bag*
Jadhav 2020 [270-S] **Country:** India **Setting (detail):** day surgery (Dental operatory)	**No. randomised (age; sex):** 52 adults (AT. 26 years, C. 26 [mean]; AT. 50% female, C. 59%) **Treatment goal:** relieve procedure-related side effects (nerve root block)	**Name:** AT - lavender (inhalation) **What – essential oil & procedure:** lavender (dilution and carrier NR) administered in vaporiser in treatment room	**Name:** inactive - placebo **What – materials & procedure:** vapouriser with plain water in treatment room	**Eligible outcomes:** Pain: periprocedural pain intensity (VAS)* Emotional functioning/mental health: periprocedural anxiety (MDAS)* **Ineligible outcomes:** n/a

Study details	Population	Aromatherapy intervention arm(s)	Comparator arm(s)	Outcomes (* = selected for synthesis)
Study design: parallel group	**Inclusion criteria:** Mandibular molars with carious exposure; Pain (⩾ 50 on 100 mm VAS); Delayed response to pulp sensibility tests **Exclusion criteria:** Periapical widening on radiographs Analgesia used in previous 12 hours **ICD code:** Dental treatment (adults) (inferior alveolar nerve block)	**When & how much:** vapouriser used for 15 minutes every 2 hours in treatment room (AT volume NR) **Who administered (provider; AT training):** provider administered (NR; NR) **Co-intervention(s):** n/a	**When & how much:** vapouriser used for 15 minutes every 2 hours in treatment room **Who administered (provider):** provider administered **No. arms included in synthesis (treatment & control):** 2 **Ineligible arms:** none	**Timing of outcome measurement:** during dental procedure (after nerve block and before access opening)*
Janula 2015 [311-S] **Country:** India **Setting (detail):** hospital - inpatient (Labour ward) **Study design:** parallel group	**No. randomised (age; sex):** 400 participants (AT. 41%, C. 46% [aged 21-25 years]; 100% female) **Treatment goal:** relieve symptoms of a condition (labour, first stage) **Inclusion criteria:** Pregnant (nulliparous, singleton, gestation >36 weeks); First stage labour (cervical dilation ⩾ 4 cm and having three uterine contractions in 10 minutes at least with a duration of 30 seconds) **Exclusion criteria:** Complications of pregnancy; use of analgesia or sedatives 3 hours prior or during the intervention **ICD code:** Labour, first stage	**Name:** AT - lavender (massage) **What – essential oil & procedure:** lavender (dilution and carrier NR) administered by back and abdominal massage **When & how much:** massage was continued until the end of first stage of labour (volume of oil NR) **Who administered (provider; AT training):** provider administered (research staff; NR) **Co-intervention(s):** usual care as per comparator arm	**Name:** inactive - usual care **What – materials & procedure:** routine care according to hospital policy **When & how much:** n/a **Who administered (provider):** n/a **No. arms included in synthesis (treatment & control):** 2 **Ineligible arms:** biofeedback (cardiotocography)	**Eligible outcomes:** Pain: labour pain intensity (measure NR)* **Ineligible outcomes:** 'Other' pregnancy, puerperium and perinatal outcomes: duration of labour **Timing of outcome measurement:** 4-5, 6-7 cm, 8-10* cm dilation
Jodaki 2021 [269-S] **Country:** Iran **Setting (detail):** hospital - inpatient (Cardiac care unit (CCU)) **Study design:** parallel group	**No. randomised (age; sex):** 60 adults (AT. 63 years, C. 62 [mean]; AT. 47% female, C. 50%) **Treatment goal:** relieve treatment-related side effects (CVD inpatient stress) **Inclusion criteria:** Hospitalised at least 24 hours for dysrhythmia, ACS, or CHF (cardiac ejection fraction of at least 40%) **Exclusion criteria:** Sleep disorder; opioids within 6 hours prior to sleep; use of over-the-	**Name:** AT - rose (inhalation) **What – essential oil & procedure:** rose (40%, carrier NR) administered on a 10 x 10 cm cloth patch attached to collar area **When & how much:** 5 drops of oil inhaled for 8 hours overnight, for 3 nights (starting on the second night of hospitalisation) **Who administered (provider; AT training):** provider administered	**Name:** inactive - placebo **What – materials & procedure:** distilled water administered on a 10 x 10 cm cloth patch attached to collar area **When & how much:** 5 drops of oil inhaled for 8 hours overnight, for 3 nights (starting on the second night of hospitalisation) **Who administered (provider):** provider administered	**Eligible outcomes:** Sleep: sleep quality overall (St Mary's Hospital Sleep Questionnaire)* Emotional functioning/mental health: anxiety during hospitalisation (STAI - state)* **Ineligible outcomes:** n/a **Timing of outcome measurement:** day 4 (morning after final AT intervention)*

Study details	Population	Aromatherapy intervention arm(s)	Comparator arm(s)	Outcomes (* = selected for synthesis)
	counter tranquillisers or hypnotic-sedative agents; orthopnea **ICD code:** BA4Z Acute ischaemic heart disease, unspecified; BD10 Congestive heart failure; BC9Z Cardiac arrhythmia, unspecified	(research staff; AT trained (certificate)) **Co-intervention(s):** n/a	**No. arms included in synthesis (treatment & control):** 2 **Ineligible arms:** none	
Jokar 2020 [319-S] **Country:** Iran **Setting (detail):** community based (Home) **Study design:** parallel group	**No. randomised (age; sex):** 50 participants (AT. 56 years, C. 54 [mean]; 100% female) **Treatment goal:** relieve symptoms of a condition (menopause) **Inclusion criteria:** Post-menopausal (absence of menstrual periods for at least 12 months, post-menopausal for a maximum of 5 years); Depression symptoms (> 10 on BDI) **Exclusion criteria:** Hormonal therapy use during the last 6 months; chronic disease; AT missed for more than 3 nights during the intervention month **ICD code:** MB24.5 Depressed mood; GA30.0 Menopause	**Name:** AT - lavender (inhalation) **What – essential oil & procedure:** lavender (2%, carrier NR) administered on a handkerchief attached to collar area **When & how much:** participants wore patch with 2 drops of oil for 20 minutes each day before bed for 4 weeks **Who administered (provider; AT training):** self-administered, provider prescribed (research staff; NR) **Co-intervention(s):** n/a	**Name:** inactive - placebo **What – materials & procedure:** distilled water administered on handkerchief attached to collar area **When & how much:** participants wore patch with 2 drops of water for 20 minutes each day before bed for 4 weeks **Who administered (provider):** self-administered, provider prescribed **No. arms included in synthesis (treatment & control):** 2 **Ineligible arms:** none	**Eligible outcomes:** Emotional functioning/mental health: depressed mood symptom severity (Beck Depression Inventory)*; anxiety symptom severity (STAI - trait and state) **Ineligible outcomes:** n/a **Timing of outcome measurement:** end of 4-week AT intervention period*
Joulaeerad 2018 [064-S] **Country:** Iran **Setting (detail):** hospital - outpatient, community based (Health centres, home) **Study design:** parallel group	**No. randomised (age; sex):** 65 adults (AT. 26 years [mean], C. 28; 100% female) **Treatment goal:** relieve symptoms of a condition (N&V in pregnancy) **Inclusion criteria:** Mild to moderate nausea & vomiting in pregnancy (PUQE score 3 - 12); Gestational age 6 - 20 weeks; Singleton pregnancy **Exclusion criteria:** Severe nausea & vomiting (PUQUE >12); pregnancy complications; taking antiemetics; mental health problems **ICD code:** Nausea and vomiting in pregnancy (NVP) (mild to moderate)	**Name:** AT - peppermint (inhalation) **What – essential oil & procedure:** peppermint (10% in sweet almond oil), administered on a cotton ball , placed 1 cm under nose and inhaled with 3 deep breaths **When & how much:** 5 drops, 4 times daily (when feeling nauseous), for 4 days **Who administered (provider; AT training):** self-administered, provider prescribed (NR; NR) **Co-intervention(s):** n/a	**Name:** inactive - placebo **What – materials & procedure:** sweet almond oil, administered on a cotton ball, placed 1 cm under nose and inhaled with 3 deep breaths **When & how much:** 5 drops, 4 times daily when feeling nauseous, for 4 days **Who administered (provider):** self-administered, provider prescribed **No. arms included in synthesis (treatment & control):** 2 **Ineligible arms:** none	**Eligible outcomes:** Nausea & vomiting: nausea and vomiting severity (PUQE)* **Ineligible outcomes:** n/a **Timing of outcome measurement:** end of days 1, 2, 3 and 4* of AT intervention

Study details	Population	Aromatherapy intervention arm(s)	Comparator arm(s)	Outcomes (* = selected for synthesis)
Jun 2013 [318-S] **Country:** South Korea **Setting (detail):** hospital - inpatient (NR) **Study design:** parallel group	**No. randomised (age; sex):** 52 adults (AT. 69 years [mean], C. 68; AT. 96% female, C. 89%) **Treatment goal:** relieve surgery-related side effects (total knee replacement) **Inclusion criteria:** Osteoarthritis; VAS score > 4 for pain; Total knee replacement surgery **Exclusion criteria:** Complications after surgery, inflammatory diseases, use of antidepressants **ICD code:** FA01 Osteoarthritis of knee (total knee replacement surgery)	**Name:** AT - eucalyptus (inhalation) **What – essential oil & procedure:** eucalyptus (3% in almond oil), applied on a 10 x 5 cm gauze pad, placed between nose and philtrum **When & how much:** 30 minutes during continuous passive motion for 3 consecutive days, starting from day 3 post-surgery **Who administered (provider; AT training):** provider administered (NR; NR) **Co-intervention(s):** usual care as per comparator arm	**Name:** inactive - placebo **What – materials & procedure:** almond oil (% and carrier n/a) applied on a 10 x 5 cm gauze pad, placed between nose and philtrum (all subjects had been prescribed pain medications, including oxycodone hydrochloride, fentanyl, nonsteroidal anti-inflammatory drugs) **When & how much:** 30 minutes during continuous passive motion for 3 consecutive days, starting from day 3 post-surgery **Who administered (provider):** provider administered **No. arms included in synthesis (treatment & control):** 2 **Ineligible arms:** none	**Eligible outcomes:** Pain: postoperative pain intensity - late acute [72, 96 and 120 hours] (VAS)* **Ineligible outcomes:** Physiological function, signs and symptoms: SBP, DBP, HR, CRP, WBC **Timing of outcome measurement:** 30 minutes after each AT Tx: days 3*, 4 and 5 after surgery (change score; day 3 is change from baseline, 4 and 5 are change from immediately prior to each AT Tx)
Kabiri 2018 [266-S] **Country:** Iran **Setting (detail):** hospital - outpatient, community based (Physical therapy clinic; home) **Study design:** parallel group	**No. randomised (age; sex):** 93 adults (AT. 49 years, C. 50 [mean]; AT. 68% female, C. 68%) **Treatment goal:** relieve symptoms of a condition (knee OA) **Inclusion criteria:** Knee osteoarthritis as per rheumatologist diagnosis (6 months - 5 years) **Exclusion criteria:** Use of analgesics or NSAIDs; symptom exacerbation; autoimmune & neuropathic diseases; intraarticular injections; knee surgery or trauma; chronic headaches; heart disease **ICD code:** FA01 Osteoarthritis of knee	**Name:** AT1 - lavender (inhalation) **What – essential oil & procedure:** lavender (undiluted, carrier n/a), administered on a cotton ball, attached to collar and inhaled **When & how much:** 2 drops overnight, alternating nights for 1 month [Kabiri 2018] 2 drops overnight, 3 nights/week for 2 months [Hasanpour-Dehkordi 2021] **Who administered (provider; AT training):** provider administered (NR; NR) **Co-intervention(s):** usual care as per comparator arm	**Name:** inactive - usual care **What – materials & procedure:** all participants underwent physiotherapy using TENS and FARADIC (Iran) at 50 Hz current **When & how much:** frequency and duration NR **Who administered (provider):** n/a **No. arms included in synthesis (treatment & control):** 2 **Ineligible arms:** Knee massage (sweet almond oil)	**Eligible outcomes:** Pain: pain intensity (KOOS - pain subscale)* [Hasanpour-Dehkordi 2021] Fatigue: fatigue severity (MFI - total fatigue score*; general fatigue subscale) [Kabiri 2018] HRQoL: overall HRQoL (KOOS - QoL subscale)* [Hasanpour-Dehkordi 2021] **Ineligible outcomes:** Other symptoms (KOOS subscale); ADL (KOOS - ADL subscale); Other function (KOOS - sport and recreation subscale) **Timing of outcome measurement:** after treatment sessions 5 and 10* (end of AT intervention period; appears to be 1 or 2 months, unclear if session refers to physiotherapy, AT treatments or both)
Karadag 2017 [264-S]	**No. randomised (age; sex):** 60 adults (AT. 53 years, C. 47 [mean]; AT. 33% female, C. 33%)	**Name:** AT - lavender (inhalation)	**Name:** inactive - no intervention **What – materials & procedure:** n/a	**Eligible outcomes:** Sleep: sleep quality overall (PSQI - total; weekly form)*

Study details	Population	Aromatherapy intervention arm(s)	Comparator arm(s)	Outcomes (* = selected for synthesis)
Country: Turkey **Setting (detail):** hospital - inpatient (Coronary intensive care unit) **Study design:** parallel group	**Treatment goal:** relieve treatment-related side effects (CVD inpatient stress) **Inclusion criteria:** Coronary artery disease (past the first 24 - 48 hours); Hospitalised in the coronary intensive care unit **Exclusion criteria:** Risk of heart failure and cardiogenic shock (class III and IV); use of antidepressants, hypnotics, benzodiazepines and narcotic derivatives that affect the quality of sleep **ICD code:** XA3B03 Coronary arteries disease	**What – essential oil & procedure:** lavender (2% carrier: n/a) administered on a 2 x 2 cm cotton gauze attached to patient gown, 12 inches below the nose **When & how much:** participants wore gauze for 20 mins before bed in the evening, for 15 days **Who administered (provider; AT training):** provider administered (research staff; NR) **Co-intervention(s):** n/a	**When & how much:** n/a **Who administered (provider):** n/a **No. arms included in synthesis (treatment & control):** 2 **Ineligible arms:** none	Emotional functioning/mental health: anxiety during hospitalisation (Beck Anxiety Inventory (BAI))* **Ineligible outcomes:** n/a **Timing of outcome measurement:** immediately following 15-day AT intervention*
Karadag 2019 [265-S] **Country:** Turkey **Setting (detail):** hospital - outpatient (Haemodialysis unit) **Study design:** parallel group	**No. randomised (age; sex):** 60 adults (AT. 56 years, C. 46 [mean]; AT. 47% female, C. 53%) **Treatment goal:** relieve procedure-related side effects (haemodialysis) **Inclusion criteria:** Receiving hemodialysis treatment regularly for at least 6 months **Exclusion criteria:** Psychiatric disorder **ICD code:** QB94 Care involving dialysis	**Name:** AT - lavender (inhalation) **What – essential oil & procedure:** lavender (2% dilution in water) administered on a 2 × 2 cm gauze dressing, placed on the chest area of the patients' clothes **When & how much:** 2 drops of oil inhaled for 20 minutes, 2 or 3 times weekly for 4 weeks (8 or 12 sessions) **Who administered (provider; AT training):** NR (NR; NR) **Co-intervention(s):** n/a	**Name:** inactive - usual care **What – materials & procedure:** routine haemodialysis **When & how much:** n/a **Who administered (provider):** n/a **No. arms included in synthesis (treatment & control):** 2 **Ineligible arms:** none	**Eligible outcomes:** Fatigue: severity of fatigue overall (Fatigue Severity Scale (FSS))* Emotional functioning/mental health: postprocedural anxiety - immediate (Beck Anxiety Inventory (BAI))* **Ineligible outcomes:** n/a **Timing of outcome measurement:** day 30 (end of AT intervention period)*
Karaman 2016 [115-S] **Country:** Turkey **Setting (detail):** hospital - inpatient (Preoperative care room) **Study design:** parallel group	**No. randomised (age; sex):** 106 adults (AT. 42 years, C. 45 [mean]; AT. 82% female, C. 92%) **Treatment goal:** relieve procedure-related side effects (peripheral venous cannulation) **Inclusion criteria:** Scheduled for elective surgery; Healthy or mild systemic disease (ASA physical status I and II); **Exclusion criteria:** Anxiety disorders; pre-operative pain	**Name:** AT - lavender (inhalation) **What – essential oil & procedure:** lavender (1%, carrier: n/a) administered on a 5 x 5 cm gauze pad **When & how much:** participants inhaled 2 drops of oil for 5 mins before and during cannulation **Who administered (provider; AT training):** self-administered,	**Name:** inactive - placebo **What – materials & procedure:** pure water administered on a 5 x 5 cm gauze pad **When & how much:** Participants inhaled 2 drops of water for 5 mins before and during cannulation **Who administered (provider):** self-administered, provider prescribed	**Eligible outcomes:** Pain: periprocedural pain intensity (VAS)* Emotional functioning/mental health: anxiety during procedure (VAS)* **Ineligible outcomes:** Other: satisfaction **Timing of outcome measurement:** 2 mins after procedure*

Study details	Population	Aromatherapy intervention arm(s)	Comparator arm(s)	Outcomes (* = selected for synthesis)
	ICD code: Peripheral venous cannulation	provider prescribed (nurse clinically qualified; NR) **Co-intervention(s):** n/a	**No. arms included in synthesis (treatment & control):** 2 **Ineligible arms:** none	
Karaman 2019 [263-S] **Country:** Turkey **Setting (detail):** hospital - inpatient (Postoperative recovery room) **Study design:** parallel group	**No. randomised (age; sex):** 184 adults (AT1. 40 years, AT2. 45, AT3. 44, C. 51 [median]; AT1. 65% female, AT2. 70%, AT3. 63%, C. 67%) **Treatment goal:** relieve surgery-related side effects (PONV) **Inclusion criteria:** Patients reporting PONV 45 mins after elective surgery (under general anaesthesia) **Exclusion criteria:** Use of antiemetic drugs **ICD code:** MD90 Nausea or vomiting (postoperative)	**Name:** AT1 - ginger (inhalation) AT2 - lavender (inhalation) AT3 - rose (inhalation) **What – essential oil & procedure:** AT1. ginger or AT2. lavender or AT3. rose (% and carrier NR) administered on a 5 × 5 cm gauze pad and inhaled **When & how much:** two drops for 5 mins, once 45 mins post-surgery **Who administered (provider; AT training):** provider administered (nurse clinically qualified; NR) **Co-intervention(s):** n/a	**Name:** inactive - placebo **What – materials & procedure:** distilled water administered on a 5 × 5 cm gauze pad and inhaled **When & how much:** two drops for 5 mins, once 45 mins post-surgery **Who administered (provider):** provider administered **No. arms included in synthesis (treatment & control):** 4 **Ineligible arms:** none	**Eligible outcomes:** Nausea & vomiting: early postoperative vomiting (proportion of participants with at least one episode)*, early postoperative vomiting severity (NRS - 4 point Likert), early postoperative nausea severity (NRS - 4 point Likert) **Ineligible outcomes:** n/a **Timing of outcome measurement:** 15 and 40* mins after AT intervention (and while in recovery)
Karan 2019 [120-S] **Country:** Turkey **Setting (detail):** day surgery (Hospital) **Study design:** parallel group	**No. randomised (age; sex):** 126 adults (age NR, AT. 73% female, C. 79%) **Treatment goal:** relieve procedure-related side effects (dental Tx) **Inclusion criteria:** Wisdom tooth extraction; Anxiety (Dental Anxiety Questionnaire score > 2); Physically healthy (ASA score I); **Exclusion criteria:** n/a **ICD code:** Wisdom tooth removal (local anaesthetic)	**Name:** AT - lavender (inhalation) **What – essential oil & procedure:** lavender (undiluted, carrier n/a) administered on a patch (no skin contact) and inhaled (proximity to patch NR) **When & how much:** 3 mins prior to surgery **Who administered (provider; AT training):** provider administered (NR; NR) **Co-intervention(s):** n/a	**Name:** inactive - no intervention **What – materials & procedure:** n/a **When & how much:** n/a **Who administered (provider):** n/a **No. arms included in synthesis (treatment & control):** 2 **Ineligible arms:** none	**Eligible outcomes:** Pain: periprocedural pain intensity (VAS)* Emotional functioning/mental health: periprocedural anxiety (STAI - state)*; general anxiety about dental procedures (MDAS) **Ineligible outcomes:** Physiological function, signs and symptoms: SBP, DBP, HR, RR, SO2 **Timing of outcome measurement:** immediately after dental procedure* (AT delivered prior to procedure)
Karimzadeh 2021.1 [262-S] **Country:** Iran **Setting (detail):** hospital - inpatient (Intensive care unit)	**No. randomised (age; sex):** 169 adults (AT1. 36 years, AT2. 36, C. 37 [mean]; 40% female) **Treatment goal:** relieve treatment-related side effects (ICU patient stress)	**Name:** AT1 - bitter orange (inhalation) AT2 - lavender (inhalation) **What – essential oil & procedure:** AT1. bitter orange or AT2. lavender (undiluted, carrier n/a),	**Name:** inactive - placebo **What – materials & procedure:** normal saline (% and carrier n/a), administered on a 4 × 4 cm gauze and attached to collar	**Eligible outcomes:** Emotional functioning/mental health: anxiety during hospitalisation (STAI - state*) [Karimzadeh 2021.2] **Ineligible outcomes:** Pain: pain intensity (VAS)

Study details	Population	Aromatherapy intervention arm(s)	Comparator arm(s)	Outcomes (* = selected for synthesis)
Study design: parallel group	**Inclusion criteria:** Admitted to ICU with stable hemodynamic status **Exclusion criteria:** Severe anxiety disorder; use of sedatives 3 hours before or during the intervention; intubation during last 24 hours **ICD code:** Intensive care (conscious)	administered on a 4 x 4 cm gauze and attached to collar **When & how much:** 5 drops, once for 30 minutes, on day 2 of ICU admission **Who administered (provider; AT training):** provider administered (NR; NR) **Co-intervention(s):** n/a	**When & how much:** 5 drops, once for 30 minutes, on day 2 of ICU admission **Who administered (provider):** provider administered **No. arms included in synthesis (treatment & control):** 3 **Ineligible arms:** none	Emotional functioning/mental health: restless/agitated, alert and calm (Richmond Agitation-Sedation Scale) Physiological function, signs and symptoms: SBP, DBP, HR, PO2 **Timing of outcome measurement:** immediately after*, 1 and 3 hours after AT intervention
Kasar 2020 [261-S] **Country:** Turkey **Setting (detail):** hospital - outpatient (Polyclinic) **Study design:** parallel group	**No. randomised (age; sex):** 66 adults (AT. 49 years, C1. 50, C2. 48 [mean]; AT. 73% female, C1. 77%, C2. 86%) **Treatment goal:** relieve procedure-related side effects (trigger point injection) **Inclusion criteria:** Myofascial pain syndrome (MPS); Scheduled for first-time trigger point injection **Exclusion criteria:** History of psychiatric diseases, corticosteroid drug use within 3 months **ICD code:** MG30.01 Chronic widespread pain (trigger point injection)	**Name:** AT - lavender (inhalation) **What – essential oil & procedure:** lavender (100%, carrier n/a), 5 drops per 100cc water, administered by a diffuser placed 30 cm away **When & how much:** 1 x throughout procedure, duration NR **Who administered (provider; AT training):** provider administered (NR; NR) **Co-intervention(s):** n/a	**Name:** C2 inactive - placebo C1 inactive - no intervention **What – materials & procedure:** C2-baby oil (undiluted, carrier n/a), 5 drops per 100cc water, administered by a diffuser placed 30 cm away C1-n/a **When & how much:** C2-1 x throughout procedure, duration NR C1-n/a **Who administered (provider):** C2-provider administered C1-n/a **No. arms included in synthesis (treatment & control):** 3 **Ineligible arms:** none	**Eligible outcomes:** Pain: postprocedural pain intensity - early acute (VAS)* Emotional functioning/mental health: postprocedural anxiety - immediate (STAI - state*; General Comfort Questionnaire) **Ineligible outcomes:** Physiological function, signs and symptoms: salivary cortisol **Timing of outcome measurement:** preprocedural, midprocedural, postprocedural*
Kaviani 2014 [317-S] **Country:** Iran **Setting (detail):** hospital - inpatient (Labour room) **Study design:** parallel group	**No. randomised (age; sex):** 160 adults (AT. 23 years, C. 22 [mean]; 100% female) **Treatment goal:** relieve symptoms of a condition (labour, first stage) **Inclusion criteria:** Uncomplicated singleton pregnancy; First stage labour (cervical dilation 3 - 4 cm); Gestational age $\geqslant$ 36 weeks **Exclusion criteria:** Planned C-section, anaesthesia and analgesia in labour room	**Name:** AT - lavender (inhalation) **What – essential oil & procedure:** lavender (0.1 mL in 1 mL distilled water) placed on 15 x 15 cm gauze and attached to gown **When & how much:** during first and second stages of labour (4 hours mean duration of first stage; mean duration of second stage NR)	**Name:** inactive - placebo **What – materials & procedure:** distilled water (2 mL) placed on 15 x 15 cm gauze and attached to gown **When & how much:** during first and second stages of labour (4 hours mean duration of first stage; mean duration of second stage NR) **Who administered (provider):** provider administered	**Eligible outcomes:** Pain: pain intensity during labour (3 - 4 cm dilation; VAS)* **Ineligible outcomes:** Other pregnancy, puerperium and perinatal outcomes: duration of 1st stage of labour; 1- and 5-min Apgar scores; maternal contentment (single item, no information about measure) **Timing of outcome measurement:** 30 and 60* minutes after start of AT intervention at 3 - 4 cm dilation

Study details	Population	Aromatherapy intervention arm(s)	Comparator arm(s)	Outcomes (* = selected for synthesis)
	ICD code: Labour, first stage	**Who administered (provider; AT training):** provider administered (NR; NR) **Co-intervention(s):** n/a	**No. arms included in synthesis (treatment & control):** 2 **Ineligible arms:** none	
Kawabata 2020 [260-S] **Country:** Japan **Setting (detail):** palliative care (Palliative care ward) **Study design:** parallel group	**No. randomised (age; sex):** 74 adults (AT. 77 years, C. 75 [mean]; AT. 59% female, C. 57%) **Treatment goal:** relieve symptoms of a condition (advanced cancer) **Inclusion criteria:** Advanced cancer; Receiving palliative care; **Exclusion criteria:** Life expectancy of $\leqslant$ 4 days; past aromatherapy experience; new or dose changes in hypnosis treatments on the study day; any steroid treatment changes within seven days before the study day **ICD code:** 02 Neoplasms; Receiving palliative care	**Name:** AT - various essential oils (massage) **What – essential oil & procedure:** lavender, orange, or a mixture of lavender and orange (dilution NR, carrier jojoba oil) administered by effleurage massage from palm to elbow and foot to knee **When & how much:** 30-minute massage performed between 20:00 and 21:00 (single session) **Who administered (provider; AT training):** provider administered (massage therapist; AT trained (certificate)) **Co-intervention(s):** n/a	**Name:** inactive - wait list control **What – materials & procedure:** n/a **When & how much:** n/a **Who administered (provider):** n/a **No. arms included in synthesis (treatment & control):** 2 **Ineligible arms:** none	**Eligible outcomes:** Sleep: sleep quality overall (RCSQ - total score)*, perceived sleep depth, sleep latency, awakenings, return to sleep, perceived sleep quality (RCSQ - subdomains) **Ineligible outcomes:** Fatigue: severity of fatigue overall (BFI - total score), fatigue right now, usual fatigue in last 24 hrs, worst fatigue in last 24 hrs, general activity, mood, walking ability, normal work, relations with other people, enjoyment of life (BFI - subdomains) **Timing of outcome measurement:** day after one-off AT intervention*
Keshavarz Afshar 2015 [062-S] **Country:** Iran **Setting (detail):** community based (Home) **Study design:** parallel group	**No. randomised (age; sex):** 158 adults (AT. 28 years, C. 28 [mean]; 100% female) **Treatment goal:** treat underlying condition (e.g. curative) (postpartum sleep disturbance) **Inclusion criteria:** Postpartum women with uncomplicated vaginal delivery; Significant sleep disturbance (PSQI $\geqslant$ 5) **Exclusion criteria:** Chronic physical (e.g. diabetes) or mental illness; use of hypnotics or sedatives **ICD code:** MG41 Sleep disturbance (significant) during postpartum period	**Name:** AT - lavender (inhalation) **What – essential oil & procedure:** lavender (10% in sesame oil), administered on a cotton ball, inhaled initially with 10 deep breaths then put inside a cylindrical container and placed beside pillow overnight **When & how much:** 4 drops nightly from bedtime until the next morning, 4 consecutive days/week x 8 weeks **Who administered (provider; AT training):** self-administered, provider prescribed (NR; NR) **Co-intervention(s):** n/a	**Name:** inactive - placebo **What – materials & procedure:** sesame oil administered on a cotton ball, inhaled initially with 10 deep breaths then put inside a cylindrical container and placed beside pillow overnight **When & how much:** 4 drops nightly from bedtime until the next morning, 4 consecutive days/week x 8 weeks **Who administered (provider):** self-administered, provider prescribed **No. arms included in synthesis (treatment & control):** 2 **Ineligible arms:** none	**Eligible outcomes:** Sleep: sleep quality overall (PSQI)* **Ineligible outcomes:** n/a **Timing of outcome measurement:** week 8 (end of AT intervention period)*

Study details	Population	Aromatherapy intervention arm(s)	Comparator arm(s)	Outcomes (* = selected for synthesis)
Kheirkhah 2014 [059-S] **Country:** Iran **Setting (detail):** hospital - inpatient (Delivery room) **Study design:** parallel group	**No. randomised (age; sex):** 108 adults (AT1. 23 years [mean], AT2. 24, C. NR; 100% female) **Treatment goal:** relieve symptoms of a condition (labour, first stage) **Inclusion criteria:** Nulliparous women, gestational age 38 - 42 weeks; Cephalic presentation at 3 cm dilation **Exclusion criteria:** Emergency caesarean or special care required **ICD code:** Labour, first stage	**Name:** AT1 - rose (inhalation + foot bath) AT2 - rose (foot bath) **What – essential oil & procedure:** AT1. rose (1% and carrier NR) diffused in birthing room AT1./AT2. rose (1% in water) in a 40-degree Celsius foot bath **When & how much:** 2 x 10 minutes, once at 4 cm dilation and once at 8 cm dilation (both inhalation and foot bath administration) **Who administered (provider; AT training):** provider administered (NR; NR) **Co-intervention(s):** n/a	**Name:** inactive - usual care **What – materials & procedure:** routine delivery room care **When & how much:** n/a **Who administered (provider):** n/a **No. arms included in synthesis (treatment & control):** 3 **Ineligible arms:** none	**Eligible outcomes:** Emotional functioning/mental health: anxiety during labour (VAS-A)* **Ineligible outcomes:** n/a **Timing of outcome measurement:** at 4 cm and 8 cm* cervical dilation, before and after* each AT intervention
Khiewkhern 2013 [258-S] **Country:** Thailand **Setting (detail):** hospital - inpatient (Chemotherapy unit) **Study design:** parallel group	**No. randomised (age; sex):** 66 adults (AT. 59 years, C. 58 [mean]; AT. 36% female, C. 39%) **Treatment goal:** relieve treatment-related side effects (chemotherapy) **Inclusion criteria:** Stage 2 - 3 colorectal cancer; Receiving adjuvant chemotherapy, min. 1 month post-surgery **Exclusion criteria:** Received professional massage within 1 mth; physiological and/or psychological problems; low platelets (<100,000 cells/ml) **ICD code:** 2B90 Malignant neoplasms of colon	**Name:** AT - ginger (massage) **What – essential oil & procedure:** ginger (0.05 mL in coconut oil, % NR), administered by Thai body massage according to a protocol **When & how much:** 3 x 45 mins massage over 1 week, after chemotherapy **Who administered (provider; AT training):** provider administered (massage therapist; NR) **Co-intervention(s):** n/a	**Name:** inactive - usual care **What – materials & procedure:** standard supportive care, not described **When & how much:** n/a **Who administered (provider):** n/a **No. arms included in synthesis (treatment & control):** 2 **Ineligible arms:** none	**Eligible outcomes:** Pain: pain intensity (NRS)* Nausea & vomiting: severity of nausea (NRS)* Emotional functioning/mental health: mental distress severity (NRS - anxiety/stress*; NRS - depression) **Ineligible outcomes:** Physiological function, signs and symptoms: RBC, WBC, Hct; Fatigue: fatigue severity (NRS) [1-week AT intervention]) **Timing of outcome measurement:** end of 1-week AT intervention period*
Kianpour 2018 [089-S] **Country:** Iran **Setting (detail):** community based (Health centres; home)	**No. randomised (age; sex):** 105 adults (AT. 27 years [mean], C1. 28, C2. 29; 100% female) **Treatment goal:** relieve symptoms of a condition (postnatal depression) **Inclusion criteria:** Pregnant (35-37 weeks gestation); At risk of depression or anxiety	**Name:** AT - lavender (inhalation) **What – essential oil & procedure:** lavender (undiluted, carrier: rose water), placed on cloth & inhaled in 10 deep breaths, then placed next to pillow	**Name:** C1 inactive - no intervention C2 inactive - placebo **What – materials & procedure:** C1-n/a C2-sesame oil (undiluted, carrier: sweet musk fragrance), placed on cloth & inhaled in 10 deep breaths, then placed next to pillow	**Eligible outcomes:** Emotional functioning/mental health: postnatal depression symptoms (EPDS - total)* **Ineligible outcomes:** n/a

Study details	Population	Aromatherapy intervention arm(s)	Comparator arm(s)	Outcomes (* = selected for synthesis)
Study design: parallel group	during pregnancy (HADS ⩽ 11, scoring 1-9 items, or any item from 10-16; EPDS ⩽ 13); History of depression or family history of psychiatric disorders; Lack of perceived social support (as measured by NSSQ) **Exclusion criteria:** Anxiety or depression during pregnancy requiring treatment (HADS >11; EPDS >13); use of drugs, alcohol, antidepressants and antianxiety medications; mental disorders (psychosis, bipolar disorder, schizophrenia); preterm delivery (<38 weeks) **ICD code:** SD82 Postpartum depression disorder (at risk population)	**When & how much:** 7 drops nightly, before sleeping and overnight, from week 38 of pregnancy to 6 weeks after delivery **Who administered (provider; AT training):** self-administered, provider prescribed (research staff; n/a) **Co-intervention(s):** n/a	**When & how much:** C1-n/a C2-7 drops nightly, before sleeping and overnight, from week 38 of pregnancy to 6 weeks after delivery **Who administered (provider):** C1-n/a C2-self-administered, provider prescribed **No. arms included in synthesis (treatment & control):** 3 **Ineligible arms:** none	**Timing of outcome measurement:** weeks 2 and 6* postpartum (week 6 is end of AT intervention period)
Kiberd 2016 [114-S] **Country:** Canada **Setting (detail):** day surgery (Post anaesthetic care unit) **Study design:** parallel group	**No. randomised (age; sex):** 44 children (AT. 7 years, C. 9 [mean]; AT. 43% female, C. 50%) **Treatment goal:** relieve surgery-related side effects (day surgery <18yrs) **Inclusion criteria:** Underwent elective day surgery; Postoperative nausea (score of ⩾; 4 on 10-point BARF scale); Healthy or mild systemic disease (ASA physical status I or II); **Exclusion criteria:** n/a **ICD code:** MD90 Nausea or vomiting (postoperative)	**Name:** AT - essential oil blend (inhalation) **What – essential oil & procedure:** lavender, spearmint, peppermint, ginger blend (100%) administered by personal inhaler **When & how much:** personal inhaler used for duration of symptoms as needed in postoperative period (24 - 48 hours) **Who administered (provider; AT training):** self-administered, provider prescribed (n/a; n/a) **Co-intervention(s):** n/a	**Name:** inactive - placebo **What – materials & procedure:** saline administered by personal inhaler **When & how much:** personal inhaler used for duration of symptoms as needed in postoperative period (24 - 48 hours) **Who administered (provider):** self-administered, provider prescribed **No. arms included in synthesis (treatment & control):** 2 **Ineligible arms:** none	**Eligible outcomes:** Nausea & vomiting: early postoperative vomiting (proportion of patients with at least one episode while in PACU)*; nausea severity (BARF scale) **Ineligible outcomes:** Nausea & vomiting: use of rescue medication **Timing of outcome measurement:** at 15-minute intervals while in PACU (after first episode of nausea)*
Kılıç Akça 2021 [254-S] **Country:** Turkey **Setting (detail):** hospital - outpatient (Haemodialysis centre) **Study design:** parallel group	**No. randomised (age; sex):** 75 adults (AT. 53 years, C1. 58 years, C2. 57 years [mean]; AT. 33% female, C1. 26%, C2. 39%) **Treatment goal:** relieve procedure-related side effects (haemodialysis) **Inclusion criteria:** Haemodialysis with a fistula > 6 months; VAS score ⩾3; Skin-moisture score <30%	**Name:** AT - essential oil blend (massage) **What – essential oil & procedure:** lavender and tea tree (ratio 2:1, 3% dilution with olive oil), 20 drops administered by arm massage according to a protocol **When & how much:** 3 x 4-min massage per week over 4 weeks	**Name:** C1 inactive - massage (co-intervention) C2 inactive - usual care **What – materials & procedure:** C1-olive oil (undiluted, carrier n/a), 20 drops administered by arm massage according to a protocol C2-usual care not described	**Eligible outcomes:** Pain: postprocedural pain intensity - early acute (VAS)* **Ineligible outcomes:** Severity, symptoms or flare of skin condition: skin moisture **Timing of outcome measurement:** week 4 (end of AT intervention period)*, week 8

Study details	Population	Aromatherapy intervention arm(s)	Comparator arm(s)	Outcomes (* = selected for synthesis)
	Exclusion criteria: Indwelling catheter **ICD code:** QB94 Care involving dialysis	**Who administered (provider; AT training):** provider administered (research staff; AT trained (certificate)) **Co-intervention(s):** see comparator arm	**When & how much:** C1-3 x 4-min massage per week over 4 weeks C2-n/a **Who administered (provider):** C1-provider administered C2-provider administered **No. arms included in synthesis (treatment & control):** 3 **Ineligible arms:** none	
Kim 2006 [255-S] **Country:** USA **Setting (detail):** hospital - inpatient (Post anaesthesia care unit (PACU)) **Study design:** parallel group	**No. randomised (age; sex):** 50 adults (AT. 43 years, C. 48 [mean]; 100% female) **Treatment goal:** relieve surgery-related side effects (breast biopsy) **Inclusion criteria:** Scheduled for surgical breast biopsy; Healthy, mild or severe systemic disease (ASA physical status I to III) **Exclusion criteria:** n/a **ICD code:** Breast biopsy	**Name:** AT - lavender (inhalation) **What – essential oil & procedure:** lavender (2%, carrier n/a), applied on the inside of oxygen mask **When & how much:** 2 drops on arrival to the PACU (duration NR) **Who administered (provider; AT training):** provider administered (NR; NR) **Co-intervention(s):** usual care as per comparator arm	**Name:** inactive - usual care **What – materials & procedure:** oxygen mask without any essential oil, 1 - 2 oxycodone/acetaminophen (5 mg/325 mg) PRN **When & how much:** on arrival to the PACU **Who administered (provider):** provider administered **No. arms included in synthesis (treatment & control):** 2 **Ineligible arms:** none	**Eligible outcomes:** Pain: postoperative pain intensity - early acute (NRS reported for those 'in pain'); proportion experiencing postoperative pain*; use of rescue analgesia (no. of patients requiring narcotics in PACU; no. of tablets per user) Nausea & vomiting: early postoperative nausea or vomiting (no. of patients experiencing nausea that required an antiemetic)* **Ineligible outcomes:** Other: time to discharge from the postanesthesia care unit (PACU); satisfaction with pain relief **Timing of outcome measurement:** 5, 30 and 60* minutes from arrival in PACU (AT treatment commenced on arrival to PACU, duration NR)
Kim 2007 [256-S] **Country:** United States **Setting (detail):** hospital - inpatient (Post-anesthesia Care Unit (PACU)) **Study design:** parallel group	**No. randomised (age; sex):** 54 adults (AT. 46 years, C. 43 [mean]; AT. 65% female, C. 59%) **Treatment goal:** relieve surgery-related side effects (laparoscopic gastric banding) **Inclusion criteria:** Scheduled for LAGB surgery; ASA physical status I-III; **Exclusion criteria:** n/a **ICD code:**	**Name:** AT - lavender (inhalation) **What – essential oil & procedure:** lavender (2%, carrier n/a) administered via oxygen facemask **When & how much:** 2 drops of oil on arrival into PACU (mean duration of intervention NR)	**Name:** inactive - placebo **What – materials & procedure:** non-scented baby oil administered via oxygen face mask **When & how much:** on arrival into PACU (mean duration of intervention NR) **Who administered (provider):** provider administered	**Eligible outcomes:** Pain: early postoperative pain intensity (NRS); use of rescue analgesics (morphine consumption (mg) during PACU stay)* **Ineligible outcomes:** Other: length of stay in PACU **Timing of outcome measurement:** 5, 30 and 60* minutes after arrival in the PACU

Study details	Population	Aromatherapy intervention arm(s)	Comparator arm(s)	Outcomes (* = selected for synthesis)
	5B81.01 Obesity in adults (laparoscopic adjustable gastric banding)	**Who administered (provider; AT training):** provider administered (NR; NR) **Co-intervention(s):** n/a	**No. arms included in synthesis (treatment & control):** 2 **Ineligible arms:** none	
Kim 2014 [267-S] **Country:** Korea **Setting (detail):** (University Medical Center) **Study design:** parallel group	**No. randomised (age; sex):** 32 adults (AT. 31% ⩾ 60 years, C. 60%; AT. 62% female, C. 67%) **Treatment goal:** relieve procedure-related side effects (nerve root block) **Inclusion criteria:** People undergoing selective nerve root block (part of body unclear); **Exclusion criteria:** People with any axiolytic, antidepressant or hormonotherapy treatments. **ICD code:** Selective nerve root block	**Name:** AT - eucalyptus (inhalation) **What – essential oil & procedure:** eucalyptus (1%, carrier: almond oil) administered on an aroma pad 30cm from nose **When & how much:** 1 mL oil inhaled for 5 minutes, 20 minutes pre-procedure **Who administered (provider; AT training):** NR (NR; NR) **Co-intervention(s):** n/a	**Name:** inactive - placebo **What – materials & procedure:** almond oil administered on an aroma pad 30cm from nose **When & how much:** 1 mL oil inhaled for 5 minutes, 20 minutes pre-procedure **Who administered (provider):** NR **No. arms included in synthesis (treatment & control):** 2 **Ineligible arms:** 1% limonene; 1% 1,8-cineole	**Eligible outcomes:** Pain: preprocedural pain intensity (VAS)* Emotional functioning/mental health: preprocedural anxiety (VAS-A*, STAI - total, POMS - global) **Ineligible outcomes:** Physiological function, signs and symptoms: SBP, DBP, PR **Timing of outcome measurement:** 20 mins prior to procedure (and immediately after AT intervention)*
Kritsidima 2010 [253-S] **Country:** Greece **Setting (detail):** community based (Dental practice) **Study design:** parallel group	**No. randomised (age; sex):** 340 adults (AT. 40 years, C. 39 [mean]; AT. 50% female, C. 50%) **Treatment goal:** relieve procedure-related side effects (dental Tx) **Inclusion criteria:** Scheduled for dental treatment (various) **Exclusion criteria:** n/a **ICD code:** Dental treatment (adults)	**Name:** AT - lavender (inhalation) **What – essential oil & procedure:** lavender (% NR, carrier: water) administered by candle warmer and diffused into waiting room **When & how much:** 5 drops oil diffused morning and afternoon; mean waiting time NR **Who administered (provider; AT training):** provider administered (research staff; NR) **Co-intervention(s):** n/a	**Name:** inactive - placebo **What – materials & procedure:** water administered by candle warmer diffused into waiting room **When & how much:** 10 mL water diffused in morning and afternoon; mean waiting time NR **Who administered (provider):** provider administered **No. arms included in synthesis (treatment & control):** 2 **Ineligible arms:** none	**Eligible outcomes:** Emotional functioning/mental health: preprocedural anxiety (STAI - state*, Modified Dental Anxiety Scale) **Ineligible outcomes:** n/a **Timing of outcome measurement:** immediately prior to dental treatment (during AT intervention)*
Küçük Alemdar 2019 [252-S] **Country:** Turkey **Setting (detail):** hospital - inpatient (Phlebotomy unit)	**No. randomised (age; sex):** 78 children (AT. 7 years, C. 7 [mean], AT. 44% female, C. 49%) **Treatment goal:** relieve procedure-related side effects (phlebotomy <18yrs) **Inclusion criteria:** Scheduled for blood tests	**Name:** AT - lavender (inhalation) **What – essential oil & procedure:** lavender (% and carrier N/R), 1 drop in 20 mL distilled water, heated in water bath and placed 10 cm away	**Name:** inactive - no intervention **What – materials & procedure:** routine procedure (unspecified) **When & how much:** n/a **Who administered (provider):** n/a	**Eligible outcomes:** Pain: periprocedural pain (Oucher scale)* Emotional functioning / mental health: periprocedural distress (procedural fear; CFS)*; periprocedural distress (parent perception of child distress; PRCD)

Study details	Population	Aromatherapy intervention arm(s)	Comparator arm(s)	Outcomes (* = selected for synthesis)
Study design: parallel group	**Exclusion criteria:** Chronic illness; local anaesthetic **ICD code:** Phlebotomy (paediatric)	**When & how much:** 1 x 10 min (from 5 mins before to 5 mins after procedure) **Who administered (provider; AT training):** provider administered (NR; NR) **Co-intervention(s):** n/a	**No. arms included in synthesis (treatment & control):** 2 **Ineligible arms:** 1. Jet lidokaine; 2. distraction (bubble blowing); 3. distraction (external thermomechanical stimulation (Buzzy))	**Ineligible outcomes:** Physiological function, signs and symptoms: salivary cortisol **Timing of outcome measurement:** before (30-60 secs), during (1-3 min)* and after (1-3 min) phlebotomy (all during AT administration)
Kyle 2006 [250-S] **Country:** United Kingdom **Setting (detail):** palliative care, CAM practice (Specialist palliative day-care; aromatherapy clinics) **Study design:** parallel group	**No. randomised (age; sex):** 37 adults [analysed] (age and % female NR) **Treatment goal:** relieve symptoms of a condition (any condition, palliative care) **Inclusion criteria:** Receiving palliative care **Exclusion criteria:** Lower limb lymphoedema or inflammation **ICD code:** Receiving palliative care (any condition)	**Name:** AT - sandalwood (massage) **What – essential oil & procedure:** sandalwood (1% dilution in sweet almond oil) administered by leg and foot massage according to a protocol + music **When & how much:** 20-minute massage, 10 minutes each leg, once per week for 4 weeks **Who administered (provider; AT training):** provider administered (aromatherapist; AT training) **Co-intervention(s):** n/a	**Name:** inactive control - massage (co-intervention) **What – materials & procedure:** sweet almond oil administered by leg and foot massage **When & how much:** 20-minute massage, 10 minutes each leg, once per week for 4 weeks **Who administered (provider):** provider administered **No. arms included in synthesis (treatment & control):** 2 **Ineligible arms:** AT - sandalwood (inhalation - aromastone)	**Eligible outcomes:** Emotional functioning/mental health: anxiety symptoms (STAI - overall score*; VAS) **Ineligible outcomes:** n/a **Timing of outcome measurement:** weeks 1, 2, 3 and 4* (VAS: before and after each AT treatment; STAI end of 4 week AT intervention period only)
Lane 2012 [248-S] **Country:** United States **Setting (detail):** hospital - inpatient (Mother-baby unit) **Study design:** parallel group	**No. randomised (age; sex):** 35 adults (31 years [mean]; 100% female) **Treatment goal:** relieve surgery-related side effects (caesarean section) **Inclusion criteria:** Scheduled cesarean section; Nausea post-surgery **Exclusion criteria:** Hyperemesis **ICD code:** MD90 Nausea or vomiting (postoperative)	**Name:** AT - peppermint (inhalation) **What – essential oil & procedure:** peppermint (dilution NR, carrier 82% alcohol,) administered on a cotton ball inside a ziplock bag **When & how much:** 1 mL on cotton ball inhaled in 3 slow breaths from distance of 5 cm at first episode of nausea, repeated at 2 and 5 mins after the initial inhalation **Who administered (provider; AT training):** provider administered (nurse clinically qualified; NR) **Co-intervention(s):** n/a	**Name:** C1 inactive - placebo C2 inactive - usual care **What – materials & procedure:** C1-sterile water (with green food coloring) administered on a cotton ball inside a ziplock bag C2-antiemetic (e.g. intravenous ondansetron or promethazine suppository) on patient request following nausea **When & how much:** C1-1 mL on cotton ball inhaled in 3 slow breaths from distance of 5 cm at first episode of nausea, repeated at 2 and 5 mins after the initial inhalation C2-n/a	**Eligible outcomes:** Nausea & vomiting: nausea and vomiting severity within 24 hours (study specific measure - 6 point scale)* **Ineligible outcomes:** n/a **Timing of outcome measurement:** 2 mins and 5* mins after initial AT intervention

Study details	Population	Aromatherapy intervention arm(s)	Comparator arm(s)	Outcomes (* = selected for synthesis)
			Who administered (provider): C1-provider administered C2-provider administered **No. arms included in synthesis (treatment & control):** 3 **Ineligible arms:** none	
Leach 2021 [247-S] **Country:** Australia **Setting (detail):** aged care facility (Aged-care facility) **Study design:** cluster randomised	**No. randomised (age; sex):** 38 adults (AT. 82 years, C. 83 [mean]; AT. 57% female; C. 82%) **Treatment goal:** relieve symptoms of a condition (agitation, dementia) **Inclusion criteria:** Diagnosis of dementia (MMSE, DSM-IV or medical); Agitation (>=39 CMAI or >=4 PAS) **Exclusion criteria:** History of significant head trauma or brain lesions; other novel therapeutic interventions for agitation **ICD code:** 6D86.4 Agitation or aggression in dementia	**Name:** AT - essential oil blend (topical) **What – essential oil & procedure:** bespoke essential oil blend (4% in cream, 3% in coconut oil and 6% in ointment) administered topically **When & how much:** 2.5 mL cream, 2.5 mL oil and 1 - 2 mL ointment, 2 - 4 x daily and PRN for 8 weeks **Who administered (provider; AT training):** provider administered (other; NR) **Co-intervention(s):** n/a	**Name:** inactive - placebo **What – materials & procedure:** cream base and coconut oil administered topically **When & how much:** 2.5 mL cream and 2.5 mL oil, 2 - 4 x daily and PRN for 8 weeks **Who administered (provider):** provider administered **No. arms included in synthesis (treatment & control):** 2 **Ineligible arms:** none	**Eligible outcomes:** Emotional functioning/mental health: agitation (CMAI-total*, CMAI-physically aggressive, CMAI-physically non-aggressive, CMAI-verbally agitated; PAS-overall, PAS-aberrate vocalisation, PAS-motor agitation, PAS-aggressiveness, PAS-resisting care) HR-QoL: overall QoL (QoL-AD) **Ineligible outcomes:** use of PRN antipsychotic medication; use of physical restraint **Timing of outcome measurement:** week 4, 8* and 10
Lee 2017 [246-S] **Country:** Taiwan **Setting (detail):** hospital - inpatient (Intensive care unit) **Study design:** parallel group	**No. randomised (age; sex):** 104 adults (AT. 51%, C. 52% [under 65 years]; AT. 68% female, C. 66%) **Treatment goal:** relieve procedure-related side effects (mechanical ventilation) **Inclusion criteria:** ICU patients undergoing mechanical ventilation; ICU admission > 1 day **Exclusion criteria:** Continuous IV analgesics or sedatives; cortisol medication **ICD code:** Mechanical ventilation (ICU)	**Name:** AT - lavender (massage) **What – essential oil & procedure:** lavender (2%, carrier NR) administered by back massage **When & how much:** 20 mL oil for 1 x 5-minute massage, then 20 minutes rest in low light room at 26 degrees C **Who administered (provider; AT training):** provider administered (research staff; AT training) **Co-intervention(s):** n/a	**Name:** inactive - no intervention **What – materials & procedure:** rest in low light room at 26 degrees C **When & how much:** 30 minutes **Who administered (provider):** n/a **No. arms included in synthesis (treatment & control):** 2 **Ineligible arms:** music therapy	**Eligible outcomes:** Emotional functioning/mental health: anxiety during hospitalisation (VAS-A*, STAI - state) **Ineligible outcomes:** Physiological function, signs and symptoms: SBP, DBP, MAP **Timing of outcome measurement:** 30 mins after the AT intervention*
Lehrner 2000 [197-S] **Country:** Austria	**No. randomised (age; sex):** 72 adults (22 - 69 years [range]; AT. 49% female, C. 62%)	**Name:** AT - sweet orange (inhalation)	**Name:** inactive - no intervention **What – materials & procedure:** n/a **When & how much:** n/a	**Eligible outcomes:** Emotional functioning/mental health: preprocedural anxiety (STAI - state* and trait; Mehrdimensionale

Study details	Population	Aromatherapy intervention arm(s)	Comparator arm(s)	Outcomes (* = selected for synthesis)
Setting (detail): community based (Dental office) **Study design:** parallel group	**Treatment goal:** relieve procedure-related side effects (dental Tx) **Inclusion criteria:** Scheduled for dental treatment (eligibility criteria NR) **Exclusion criteria:** n/a **ICD code:** Dental treatment (adults)	**What – essential oil & procedure:** sweet orange (dilution NR) administered via diffuser **When & how much:** 0.25 mL diffused into waiting room at morning and midday (waiting time NR) **Who administered (provider; AT training):** NR (NR; NR) **Co-intervention(s):** n/a	**Who administered (provider):** n/a **No. arms included in synthesis (treatment & control):** 2 **Ineligible arms:** none	Befindlichkeitsfragebogen (MDBF) - current mood, alertness, and calmness) **Ineligible outcomes:** n/a **Timing of outcome measurement:** outcomes were collected during AT intervention in the waiting room (~20 minutest to complete questionnaires)*
Lemon 2004 [196-S] **Country:** United Kingdom **Setting (detail):** hospital - inpatient, hospital - outpatient (Day hospital) **Study design:** parallel group	**No. randomised (age; sex):** 32 adults (AT. 23 - 53 years [range], C. NR; AT. 63% female; C. NR) **Treatment goal:** relieve symptoms of a condition (anxiety and/or depression) **Inclusion criteria:** Depression (mild to severe, MADRS; > 7) and/or anxiety (severity as per TBAS, score NR) **Exclusion criteria:** n/a **ICD code:** SD82 Depression disorder (mild to severe); MB24.3 Anxiety (severity NR)	**Name:** AT - essential oil blend (massage) **What – essential oil & procedure:** Bergamot, chamomile, clary sage, geranium, jasmine, lavender, lemon, rose, or sandalwood (participants selected at least 4 of 9 oils; undiluted, carrier: grape seed) administered by full body massage according to a protocol **When & how much:** 40-minute massage, once every 2 weeks over 12 weeks (6 sessions) **Who administered (provider; AT training):** provider administered (aromatherapist; NR) **Co-intervention(s):** n/a	**Name:** inactive control - massage (co-intervention) **What – materials & procedure:** grape seed oil administered by full body massage according to a protocol **When & how much:** 40-minute massage, once every 2 weeks over 12 weeks (6 sessions) **Who administered (provider):** provider administered **No. arms included in synthesis (treatment & control):** 2 **Ineligible arms:** none	**Eligible outcomes:** Emotional functioning/mental health: severity of anxiety or depressive disorder (Hospital Depression Anxiety Scale (HADS) - anxiety and depression subdomains*; Montgomery-Asberg Depression Rating Scale (MADRS); Tyrer Brief Anxiety Scale (TBAS)) **Ineligible outcomes:** n/a **Timing of outcome measurement:** weeks 4, 8 and 12* (end of AT intervention period)
Lillehei 2015 [200-S] **Country:** USA **Setting (detail):** community based (Participants' usual sleep setting) **Study design:** parallel group	**No. randomised (age; sex):** 79 adults (AT. 21 years, C. 22 [mean]; AT. 64% female, C. 73%) **Treatment goal:** treat underlying condition (e.g. curative) (sleep disturbance) **Inclusion criteria:** Self-reported sleep issues (difficulty falling asleep, frequent awakenings during the night, or daytime sleepiness) **Exclusion criteria:** Prescription sleep medications; night shift work	**Name:** AT - lavender (inhalation) **What – essential oil & procedure:** lavender (% and carrier NR), administered on a 3 cm slow-release adhesive patch, attached to mid-upper chest (+ sleep hygiene) **When & how much:** 55 µl per one patch, overnight for 6 nights	**Name:** inactive - placebo **What – materials & procedure:** blank patch, attached to mid-upper chest + sleep hygiene (modified from NIH-recommended list of sleep practices) **When & how much:** one patch, overnight for 6 nights **Who administered (provider):** self-administered, provider prescribed	**Eligible outcomes:** sleep: sleep quality (PSQI overall*; PROMIS sleep hygiene survey; sleep diary); sleep quantity (Fitbit tracker) **Ineligible outcomes:** Sleep: sleep hygiene behaviours (survey); HRQoL: self-assessment of change questionnaire (SAC; individual items).

Study details	Population	Aromatherapy intervention arm(s)	Comparator arm(s)	Outcomes (* = selected for synthesis)
	ICD code: Self-reported sleep disturbance	**Who administered (provider; AT training):** self-administered, provider prescribed (NR; NR) **Co-intervention(s):** see comparator arm	**No. arms included in synthesis (treatment & control):** 2 **Ineligible arms:** none	**Timing of outcome measurement:** days 5 (end of AT intervention period)* and 19 (2 weeks after end of AT intervention period)
Lin 2007 [245-S] **Country:** Hong Kong **Setting (detail):** aged care facility (Care and attention homes) **Study design:** crossover	**No. randomised (age; sex):** 70 (78 years [mean]; 59% female) **Treatment goal:** relieve symptoms of a condition (agitation, dementia) **Inclusion criteria:** Dementia diagnosis (DSM-IV); Clinically significant agitation (CCMAI assessment by research team psychiatrist); No restriction on concurrent use of psychotropics **Exclusion criteria:** **ICD code:** 6D8Z Dementia, Unknown or Unspecified Cause (mixed)	**Name:** AT - lavender (inhalation) **What – essential oil & procedure:** lavender (100%, carrier n/a) in a diffuser placed either side of pillow while sleeping **When & how much:** 2 x drops for 1-hour diffusion (minimum) per night for 3 weeks (21 days) **Who administered (provider; AT training):** provider administered (other; NR) **Co-intervention(s):** n/a	**Name:** inactive - placebo **What – materials & procedure:** sunflower oil (undiluted, carrier n/a) in a diffuser placed either side of pillow while sleeping **When & how much:** 2 drops for 1-hour diffusion (minimum) per night for 3 weeks (21 days) **Who administered (provider):** provider administered **No. arms included in synthesis (treatment & control):** 2 **Ineligible arms:** none	**Eligible outcomes:** Emotional functioning/mental health: agitation (CCMAI - overall*; NPI - agitation subscale); BPSD (NPI - overall; subscales: delusions, hallucinations, depression/dysphoria, anxiety, euphoria/elation, apathy/indifference, disinhibition, irritability/lability, aberrant motor behaviour, nigh-time behaviour, appetite/eating change) **Ineligible outcomes:** n/a **Timing of outcome measurement:** week 3 (end of AT or control intervention period 1); week 5 (end of 2 week washout); week 8 (end of AT or control intervention period 2)*
Lotfi 2019 [074-S] **Country:** Iran **Setting (detail):** hospital - inpatient (Coronary care unit) **Study design:** parallel group	**No. randomised (age; sex):** 94 adults (AT. 54 years, C. 53 [mean]; AT. 47% female, C. 47%) **Treatment goal:** relieve treatment-related side effects (CVD inpatient stress) **Inclusion criteria:** Acute coronary artery syndrome **Exclusion criteria:** Psychological disorders; hypothyroidism; cardiac dysrhythmia; received cardiopulmonary resuscitation in ER **ICD code:** XA3B03 Coronary arteries disease	**Name:** AT - lemon balm (inhalation) **What – essential oil & procedure:** lemon balm (in sesame oil, % NR) on 15 x 15 cm cotton patch, attached to collar **When & how much:** 3 drops, 2 x 30 mins daily for 3 consecutive days **Who administered (provider; AT training):** provider administered (research staff; NR) **Co-intervention(s):** n/a	**Name:** inactive - placebo **What – materials & procedure:** sesame oil (undiluted) on 15 x 15cm cotton patch, attached to collar **When & how much:** 3 drops on, 2 x 30 mins daily for 3 consecutive days **Who administered (provider):** provider administered **No. arms included in synthesis (treatment & control):** 2 **Ineligible arms:** none	**Eligible outcomes:** Emotional functioning/mental health: anxiety during hospitalisation (STAI - total)* **Ineligible outcomes:** n/a **Timing of outcome measurement:** days 2 and 3* of 3-day AT intervention
Lua 2015 [242-S]	**No. randomised (age; sex):** 75 adults (AT. 46 years, C. 49 [mean], 100% female)	**Name:** AT (P1) - ginger (inhalation) AT (P2) - ginger (inhalation)	**Name:** C (P1) inactive - placebo C (P2) inactive - placebo	**Eligible outcomes:** Nausea & vomiting: nausea severity (VAS)*; nausea & vomiting severity (EORTC QLQ-

Study details	Population	Aromatherapy intervention arm(s)	Comparator arm(s)	Outcomes (* = selected for synthesis)
Country: Malaysia **Setting (detail):** hospital - outpatient (Oncology clinic) **Study design:** crossover	**Treatment goal:** relieve treatment-related side effects (chemotherapy) **Inclusion criteria:** Breast cancer; Receiving chemotherapy (at least two previous and at least two remaining courses); Nausea and vomiting (any severity) **Exclusion criteria:** Other malignancies; concurrent radiotherapy **ICD code:** 2C6Z Malignant neoplasms of breast, unspecified; MD90 Nausea or vomiting (chemotherapy-related)	**What – essential oil & procedure:** ginger (% and carrier NR) administered by aromatherapy necklace worn 20 cm from nose (washout period: 2 weeks) [standard procedures for nausea and emesis prevention and management were conducted in accordance with the standard chemotherapy protocol and patient's clinical condition] **When & how much:** 2 drops oil placed in necklace, with participants encouraged to do at least 3 x 2 minutes of deep breathing over the day while holding necklace directly under nose, worn continuously for 5 days **Who administered (provider; AT training):** self-administered, provider prescribed (NR; NR) **Co-intervention(s):** n/a	**What – materials & procedure:** ginger fragrance administered by aromatherapy necklace worn 20 cm from nose (washout period: 2 weeks) **When & how much:** 2 drops oil placed in necklace, with participants encouraged to do at least 3 x 2 minutes of deep breathing over the day while holding necklace directly under nose, worn continuously for 5 days **Who administered (provider):** self-administered, provider prescribed **No. arms included in synthesis (treatment & control):** 4 **Ineligible arms:** none	C30 - nausea and vomiting scale), vomiting frequency (self-report; over 24 hours) Fatigue: fatigue severity (EORTC QLQ-C30 - fatigue scale)* Emotional functioning/mental health: mental distress (EORTC QLQ-C30 - emotional functioning scale)* Physical function: physical function (EORTC QLQ-C30 - physical functioning scale)* **Ineligible outcomes:** Pain: EORTC QLQ-C30 - pain subscale; HR-QoL - EORTC QLQ-C30 - general health subscale; Other symptoms: role, social and cognitive functioning (EORTC QLQ-C30 - subscales); dyspnea, insomnia, appetite loss, constipation, diarrhoea (EORTC QLQ-C30 - items); Financial difficulties **Timing of outcome measurement:** days 1, 2, 3, 4, 5* (end of AT intervention period; 5 days post-chemotherapy; nausea severity, vomiting frequency); day 8 (EORTC QLQ-C30*)
Lytle 2014 [241-S] **Country:** United States **Setting (detail):** hospital - inpatient (Intermediate care unit) **Study design:** parallel group	**No. randomised (age; sex):** 50 adults (AT. 50 years, C. 54 [mean]; AT. 64% female, C. 68%) **Treatment goal:** relieve treatment-related side effects (IMCU patient stress) **Inclusion criteria:** Admitted to IMCU (⩾ 2 nights); **Exclusion criteria:** Respiratory problems requiring mechanical ventilation or continuous positive airway pressure; receiving oxygen via mask; new blood pressure medication or a sleeping pill on the night of the study **ICD code:** Admitted to IMCU	**Name:** AT - lavender (inhalation) **What – essential oil & procedure:** lavender (undiluted, carrier n/a) administered in glass jar 1 m from bedside **When & how much:** 3 mL of oil for one night (8 hours) **Who administered (provider; AT training):** provider administered (nurse clinically qualified; AT training) **Co-intervention(s):** usual care as per comparator arm	**Name:** inactive - usual care **What – materials & procedure:** usual care details NR **When & how much:** n/a **Who administered (provider):** n/a **No. arms included in synthesis (treatment & control):** 2 **Ineligible arms:** none	**Eligible outcomes:** Sleep: sleep quality overall (RCSQ - total)*; deep/light sleep, ease of falling asleep, awakenings, ease of return to sleep, quality of sleep (RSCQ subdomains) **Ineligible outcomes:** Physiological function, signs and symptoms: MAP, HR, RR, SaO2 **Timing of outcome measurement:** morning after the overnight AT intervention *
Maghami 2020	**No. randomised (age; sex):**	**Name:** AT - peppermint (inhalation)	**Name:** inactive - usual care	**Eligible outcomes:**

Study details	Population	Aromatherapy intervention arm(s)	Comparator arm(s)	Outcomes (* = selected for synthesis)
[240-S] **Country:** Iran **Setting (detail):** hospital - inpatient (Cardiac surgery ward) **Study design:** parallel group	60 adults (AT. 62 years, C. 58 [mean]; AT. 14% female; C. 16%) **Treatment goal:** relieve surgery-related side effects (open heart surgery) **Inclusion criteria:** Scheduled for open heart surgery **Exclusion criteria:** Endotracheal tube > 24 hrs; reintubation **ICD code:** Open heart surgery	**What – essential oil & procedure:** peppermint (10% in distilled water), infused into nebuliser of ventilator and nebuliser masks as per protocol **When & how much:** 0.1mL, infused over 10 min x 3 times (30 min before tracheal extubation, 4 and 8 hrs after endotracheal tube removal) **Who administered (provider; AT training):** provider administered (NR; NR) **Co-intervention(s):** n/a	**What – materials & procedure:** pain management, postextubation oxygen therapy with nasal mask or nasal cannula **When & how much:** n/a **Who administered (provider):** provider administered **No. arms included in synthesis (treatment & control):** 2 **Ineligible arms:** none	Nausea & vomiting: nausea within 12 hours postoperatively, nausea severity, nausea duration, vomiting within 24 hours (number of episodes)* **Ineligible outcomes:** n/a **Timing of outcome measurement:** regular assessment from extubation until 12 hrs postoperative; reported in 4-hourly postoperative periods (0-4 hrs; 5-8 hrs; 9-12* hrs).
Marofi 2015 [080-S] **Country:** Iran **Setting (detail):** hospital - inpatient (Pediatric surgery ward) **Study design:** parallel group	**No. randomised (age; sex):** 64 children (AT. 4 years, C. 4 [mean]; AT. 31% female, C. 25%) **Treatment goal:** relieve surgery-related side effects (paediatric surgery, various) **Inclusion criteria:** Children hospitalised for surgery **Exclusion criteria:** Multiple surgical incisions; chronic pain **ICD code:** Surgery (paediatric, various)	**Name:** AT - rose (inhalation) **What – essential oil & procedure:** rose (% and carrier NR), 1-2 drops applied on eye pad and inhaled from distance of 30 cm **When & how much:** immediately after surgery, then 3, 6, 9, 12h after surgery **Who administered (provider; AT training):** provider administered (NR; NR) **Co-intervention(s):** n/a	**Name:** inactive - placebo **What – materials & procedure:** almond oil (100%), 1-2 drops applied on eye pad and inhaled at distance of 30 cm **When & how much:** immediately after surgery, then 3, 6, 9, 12h after surgery **Who administered (provider):** provider administered **No. arms included in synthesis (treatment & control):** 2 **Ineligible arms:** none	**Eligible outcomes:** Pain: postoperative pain intensity - acute [12 hrs] (TPPPS)* **Ineligible outcomes:** n/a **Timing of outcome measurement:** 3, 6, 9, 12* hrs after surgery
Marzouk 2013 [306-S] **Country:** Egypt **Setting (detail):** community based (Nursing Faculty student clinic; home) **Study design:** crossover	**No. randomised (age; sex):** 95 women (AT. 20 years, C. 20 [mean]) **Treatment goal:** relieve symptoms of a condition (dysmenorrhea) **Inclusion criteria:** Dysmenorrhea (⩾ 6 on 10-point VAS); Regular menstrual cycle; **Exclusion criteria:** Systemic or gynaecological disease Hormonal therapy in previous 6 months Receiving analgesics during study period	**Name:** AT (P1) - essential oil blend (massage) AT (P2) - essential oil blend (massage) **What – essential oil & procedure:** cinnamon, clove, rose and lavender (5%, carrier: sweet almond) administered by abdominal massage (protocol NR) **When & how much:** 10-minute massage daily over 7 days prior to menstruation	**Name:** C (P1) - inactive control - massage (co-intervention) C (P2) - inactive control - massage (co-intervention) **What – materials & procedure:** sweet almond administered by abdominal massage (protocol NR) **When & how much:** 10-minute massage daily over 7 days prior to menstruation **Who administered (provider):** provider administered	**Eligible outcomes:** Pain: pain intensity (VAS)*, duration of pain (hours) **Ineligible outcomes:** Overall menstrual symptoms: amount of menstrual bleeding **Timing of outcome measurement:** days 1*, 2 and 3 of menstruation during 1st treatment cycle; days 1*, 2 and 3 of menstruation during 2nd treatment cycle (day 1 is the first measurement timepoint after end of AT or control intervention in periods 1 and 2)

Study details	Population	Aromatherapy intervention arm(s)	Comparator arm(s)	Outcomes (* = selected for synthesis)
	Pelvic surgery, endometriosis, pelvic inflammatory disease (PID), ovarian cysts, pathological vaginal secretion, chronic abdominal pain, inflammatory bowel disease, and irritable bowel syndrome **ICD code:** GA34.3 Dysmenorrhoea	**Who administered (provider; AT training):** provider administered (research staff; NR) **Co-intervention(s):** n/a	**No. arms included in synthesis (treatment & control):** 4 **Ineligible arms:** none	
Mascherona 2020 [238-S] **Country:** Switzerland **Setting (detail):** aged care facility (Intermediate care facility) **Study design:** parallel group	**No. randomised (age; sex):** 32 elderly (AT. 87 years [mean], C. 85; AT. 94% female, C. 44%) **Treatment goal:** relieve symptoms of a condition (BPSD) **Inclusion criteria:** Dementia with associated behavioural and psychological symptoms **Exclusion criteria:** Mild cognitive impairments; alcoholic dementia **ICD code:** 6D8Z Dementia, Unknown or Unspecified Cause (mixed)	**Name:** AT - lavender & sweet orange (inhalation) + psychotropic therapy (co-intervention) **What – essential oil & procedure:** lavender & sweet orange (undiluted, carrier n/a), administered via a diffuser, combined with psychotropic therapy **When & how much:** 6 drops, 3 x 60 minutes (7am, 12 pm and 3 pm) for sweet orange, and 6 drops, 1 x 60 minutes (at 8 pm) for lavender over 8 consecutive days (14 days for long-stay participants) **Who administered (provider; AT training):** provider administered (NR; NR) **Co-intervention(s):** see comparator arm	**Name:** inactive - psychotropic therapy (co-intervention) **What – materials & procedure:** psychotropic medications (neuroleptics, antidepressants, benzodiazepines) **When & how much:** n/a **Who administered (provider):** NR **No. arms included in synthesis (treatment & control):** 2 **Ineligible arms:** none	**Eligible outcomes:** Emotional functioning/mental health: behavioural and psychological symptoms of dementia (BPSD) - overall (NPI-NH - overall*, NPI-NH - thymic, psychotic, motor manifestation subdomains); psychotropic medication use **Ineligible outcomes:** Emotional functioning/mental health: healthcare personnel psychological distress (NPI-NH subscale) **Timing of outcome measurement:** days 2, 5, 8* and 14 from start of AT intervention (day 5 results NR; day 14 evaluation only undertaken for long-stay participants and results NR)
Mehta 1998 [305-S] **Country:** United Kingdom **Setting (detail):** primary care (Community dentistry) **Study design:** parallel group	**No. randomised (age; sex):** 120 participants (age & sex NR) **Treatment goal:** prevent surgery-related side effects (dental extraction <18yrs) **Inclusion criteria:** Dental extraction under general anesthesia; ASA I (normal healthy patient) or II (mild systemic disease) **Exclusion criteria:** n/a **ICD code:**	**Name:** AT - sweet orange (inhalation) **What – essential oil & procedure:** sweet orange (undiluted, carrier n/a), administered on breathing filter placed between breathing system and anesthetic mask **When & how much:** 4 drops, 1 x inhalation during induction of anesthesia	**Name:** inactive - usual care **What – materials & procedure:** standard anesthetic technique (anaesthetic gas: 50% oxygen/nitrous oxide + sevflurane) induced by face mask **When & how much:** n/a **Who administered (provider):** provider administered **No. arms included in synthesis (treatment & control):** 2	**Eligible outcomes:** Nausea & vomiting: perioperative nausea and vomiting* (number of episodes; time NR) **Ineligible outcomes:** Other symptoms: incidence of complications (shivering, restlessness) **Timing of outcome measurement:** end of AT intervention period (during and after dental surgery)*

Study details	Population	Aromatherapy intervention arm(s)	Comparator arm(s)	Outcomes (* = selected for synthesis)
	Dental extraction under general anaesthesia (children)	**Who administered (provider; AT training):** provider administered (medical practitioner; NR) **Co-intervention(s):** usual care as per comparator arm	**Ineligible arms:** none	
Mirhosseini 2021.1 [044-S] **Country:** Iran **Setting (detail):** hospital - inpatient (Gynecological ward) **Study design:** parallel group	**No. randomised (age; sex):** 80 adults (29 years [mean], 100% female) **Treatment goal:** relieve surgery-related side effects (caesarean section) **Inclusion criteria:** Primiparous, scheduled for caesarean section; Complete consciousness (GCS = 15) **Exclusion criteria:** Arthritis in massage area, mental illness incl. anxiety disorders **ICD code:** JB22.0 Delivery by elective caesarean section	**Name:** AT - orange (massage) **What – essential oil & procedure:** orange (1.5%, carrier NR), administered by foot massage according to a protocol **When & how much:** 10-15 mL oil, 10-minute massage every 5 minutes (overall duration NR) **Who administered (provider; AT training):** provider administered (massage therapist; AT trained (certificate)) **Co-intervention(s):** n/a	**Name:** inactive - massage (co-intervention) **What – materials & procedure:** foot massage as per protocol **When & how much:** 10-minute massage every 5 minutes (overall duration NR) **Who administered (provider):** provider administered **No. arms included in synthesis (treatment & control):** 2 **Ineligible arms:** none	**Eligible outcomes:** Pain: postoperative pain intensity - early acute (VAS)* Emotional functioning/mental health: postoperative anxiety - early acute (STAI - state)* **Ineligible outcomes:** n/a **Timing of outcome measurement:** immediately after*, 60 minutes after AT intervention
Mitchell 1993 [303-S] **Country:** United Kingdom **Setting (detail):** aged care facility (Respite care unit for people with dementia-related conditions) **Study design:** crossover	**No. randomised (age; sex):** 12 adults (64 - 91 years [range]; % female NR) **Treatment goal:** relieve symptoms of a condition (BPSD) **Inclusion criteria:** Dementia (eligibility based on dementia-care setting only) **Exclusion criteria:** n/a **ICD code:** 6D8Z Dementia, Unknown or Unspecified Cause	**Name:** AT1 - lavender (inhalation) and lemon balm (topical) **What – essential oil & procedure:** lavender (100%, 6 drops in bathing water in morning and on pillow at night); lemon balm (3%, grapeseed oil carrier) applied topically to the chin **When & how much:** 3 x AT interventions daily (morning, midday, night) over 2 weeks **Who administered (provider; AT training):** provider administered (NR; NR) **Co-intervention(s):** usual care as per comparator arm	**Name:** inactive - placebo **What – materials & procedure:** grapeseed oil (100%, 6 drops in bathing water in morning and on pillow at night); grapeseed oil carrier applied topically to the chin; medication as per usual care **When & how much:** 3 x placebo interventions daily (morning, midday, night) over 2 weeks **Who administered (provider):** provider administered **No. arms included in synthesis (treatment & control):** 2 **Ineligible arms:** none	**Eligible outcomes:** Emotional functioning/mental health: BPSD (study-specific measure of domains: communication, independence, functioning, resistance, wandering, restlessness*) **Ineligible outcomes:** n/a **Timing of outcome measurement:** week 1, week 2 (end of AT or control intervention periods 1 and 2)*, week 4, week 5 (end of AT or control intervention period 2)*
Mohammadpourhodki 2021	**No. randomised (age; sex):**	**Name:** AT1 - bitter orange (massage)	**Name:** inactive control - massage (co-intervention)	**Eligible outcomes:** Fatigue: fatigue severity overall (FSS)*

Study details	Population	Aromatherapy intervention arm(s)	Comparator arm(s)	Outcomes (* = selected for synthesis)
[109-S] **Country:** Iran **Setting (detail):** hospital - outpatient (Haemodialysis ward) **Study design:** parallel group	105 adults (AT1. 50 years, AT2. 51 C. 58 [mean]; AT1. 34% female, AT2. 29%, C. 43%) **Treatment goal:** relieve procedure-related side effects (haemodialysis) **Inclusion criteria:** Receiving haemodialysis (3 x week for more than 3 months); **Exclusion criteria:** Candidate for kidney transplant; complications of lower extremities, vascular problems **ICD code:** QB94 Care involving dialysis	AT2 - lavender (massage) **What – essential oil & procedure:** AT1. bitter orange or AT2. lavender (1.5%, carrier NR) administered by lower limb massage according to a protocol **When & how much:** 10 - 15 mL in 20-minute massage, 3 times per week over 4 weeks (12 sessions) **Who administered (provider; AT training):** provider administered (nurse clinically qualified; AT training) **Co-intervention(s):** n/a	**What – materials & procedure:** foot massage (no further description) **When & how much:** frequency and duration of massage NR **Who administered (provider):** provider administered **No. arms included in synthesis (treatment & control):** 3 **Ineligible arms:** none	HR-QoL: overall HR-QoL (SF-36 total score)*, general health (SF-36 subscale) Physical function: physical functioning (SF-36 physical function subscale)* **Ineligible outcomes:** HR-QoL: physical role limitations, emotional role limitations, vitality, mental health, social functioning, bodily pain (SF-36 subscales) Sleep: sleep quality (PSQI) **Timing of outcome measurement:** end of week 4* (end of AT intervention period)
Moradi 2021 [296-S] **Country:** Iran **Setting (detail):** (Hospital) **Study design:** parallel group	**No. randomised (age; sex):** 92 adults (AT. 56 years, C. 56 [mean]; AT. 48% female, C. 40%) **Treatment goal:** relieve procedure-related side effects (coronary angiography) **Inclusion criteria:** Scheduled for coronary angiography alone; No prior angiography; **Exclusion criteria:** Exposure to other invasive methods such as echocardiography through the mouth before angiography; requiring transfer to CCU or ICU **ICD code:** Coronary angiography	**Name:** AT - orange (inhalation) **What – essential oil & procedure:** Bitter orange (dilution and carrier NR) administered on cotton wool attached to collar area **When & how much:** 4 mL of oil inhaled for 15 - 20 minutes, 60 minutes prior to procedure **Who administered (provider; AT training):** NR (NR; NR) **Co-intervention(s):** n/a	**Name:** inactive - placebo **What – materials & procedure:** distilled water administered on cotton wool attached to collar area **When & how much:** 4 mL of water inhaled from cotton wool for 15 - 20 minutes, 60 minutes prior to procedure **Who administered (provider):** NR **No. arms included in synthesis (treatment & control):** 2 **Ineligible arms:** none	**Eligible outcomes:** Emotional functioning/mental health: preprocedural anxiety (STAI - state)* **Ineligible outcomes:** Physiological function, signs and symptoms: SBP, DBP, RR, PR **Timing of outcome measurement:** ~20 mins prior to the procedure (and 20 mins after the AT intervention)*
Moslemi 2019 [092-S] **Country:** Iran **Setting (detail):** hospital - inpatient (Coronary care unit) **Study design:** parallel group	**No. randomised (age; sex):** 140 adults (AT. 57 years, C. 57 [mean]; AT. 59% female, C. 47%) **Treatment goal:** relieve treatment-related side effects (CVD inpatient stress) **Inclusion criteria:** Diagnosed with acute coronary syndrome; STAI-state score > 20	**Name:** AT - neroli (inhalation) **What – essential oil & procedure:** neroli oil (30% in liquid paraffin), applied on a 2 x 2 cm gauze and attached to patient's clothes **When & how much:** 1.5 mL, 1 x 20 mins, day 2 of hospitalisation	**Name:** inactive - placebo **What – materials & procedure:** liquid paraffin (undiluted, carrier n/a), applied on a 2 x 2 cm gauze and attached to patient's clothes **When & how much:** 1.5 mL, 1 x 20min, day 2 of hospitalisation **Who administered (provider):** provider administered	**Eligible outcomes:** Emotional functioning/mental health: anxiety during hospitalisation (STAI - state)* **Ineligible outcomes:** n/a **Timing of outcome measurement:** immediately after the AT intervention*

Study details	Population	Aromatherapy intervention arm(s)	Comparator arm(s)	Outcomes (* = selected for synthesis)
	Exclusion criteria: Psychological disorders; uncontrolled chronic diseases; use of anxiolytics day prior to intervention **ICD code:** BA4Z Acute ischaemic heart disease, unspecified	**Who administered (provider; AT training):** provider administered (nurse clinically qualified; NR) **Co-intervention(s):** n/a	**No. arms included in synthesis (treatment & control):** 2 **Ineligible arms:** none	
Motilal 2013 [195-S] **Country:** Trinidad and Tobago **Setting (detail):** hospital - outpatient (Diabetes outpatient clinic) **Study design:** parallel group	**No. randomised (age; sex):** 74 adults (AT. 61 years, C. 60 [mean]; AT. 68% female, C. 68%) **Treatment goal:** relieve symptoms of a condition (diabetic polyneuropathy) **Inclusion criteria:** Diabetes or impaired glucose tolerance; Neuropathic pain (DN4 > 4) **Exclusion criteria:** Cervical or lumbosacral pain; tendinitis; spurs **ICD code:** 8C03.0 Diabetic polyneuropathy	**Name:** AT - nutmeg extracts (topical) **What – essential oil & procedure:** nutmeg (14% in coconut oil carrier, 2% mace, 6% methylsalicylate, 6% menthol, alcohol) applied to the affected area **When & how much:** 4 sprays followed by gentle massage, 3 x per day for 4 weeks **Who administered (provider; AT training):** self-administered, provider prescribed (NR; NR) **Co-intervention(s):** n/a	**Name:** inactive - placebo **What – materials & procedure:** coconut oil (6% methylsalicylate, 6% menthol; alcohol) applied to the affected area **When & how much:** 4 sprays followed by gentle massage, 3 x per day for 4 weeks **Who administered (provider):** self-administered, provider prescribed (NR; NR) **No. arms included in synthesis (treatment & control):** 2 **Ineligible arms:** none	**Eligible outcomes:** Pain: neuropathic pain intensity (NPSI: total score*, burning, tingling, pins and needles; BPI-DPN: worst pain, average pain) Physical function: disability - on walking (BPI-DPN: walking ability)* **Ineligible outcomes:** Sleep: sleep quality (BPI-DPN: sleep) **Timing of outcome measurement:** week 4 (immediate at end of AT intervention period)*
Muz 2017 [302-S] **Country:** Turkey **Setting (detail):** hospital - outpatient, community based (Haemodialysis unit; home) **Study design:** parallel group	**No. randomised (age; sex):** 62 adults (AT. 52 years, C. 59 [mean]; AT. 33% female, C. 54%) **Treatment goal:** relieve procedure-related side effects (haemodyalysis) **Inclusion criteria:** Require haemodialysis ($\geqslant$ 3 months, $\geqslant$ 3 sessions weekly); Average to severe fatigue ($\geqslant$ 3 on 10-point VAS); Sleep disturbance ($\geqslant$ 5 on 21-point PSQI) **Exclusion criteria:** Use of sleeping pills before AT or during study; use of other integrative medicine applications during treatment **ICD code:** QB94 Care involving dialysis; MG41 Sleep disturbance; MG22 Fatigue	**Name:** AT - sweet orange & lavender (inhalation) **What – essential oil & procedure:** lavender & sweet orange oil in a 1:1 ratio (dilution and carrier NR) administered on a gauze bandage placed 5 cm from nose **When & how much:** one drop of each oil inhaled for 2 minutes before bed every day for 1 month **Who administered (provider; AT training):** self-administered, provider prescribed (aromatherapist; AT training) **Co-intervention(s):** usual care as per comparator arm	**Name:** inactive - usual care **What – materials & procedure:** usual care details NR **When & how much:** n/a **Who administered (provider):** n/a **No. arms included in synthesis (treatment & control):** 2 **Ineligible arms:** none	**Eligible outcomes:** Sleep: sleep quality overall (PSQI - total score* [modified, no use of sleep medication subscale]); subjective sleep quality, sleep latency, sleep duration, habitual sleep efficiency, sleep disturbance, daytime dysfunction (PSQI subscales) Fatigue: severity of fatigue overall (PFS - total score**, VAS); behavioural/severity, affective meaning, sensory, cognitive/mood (PFS subscales) **Ineligible outcomes:** n/a **Timing of outcome measurement:** Sleep: week 4* (end of AT intervention period) Fatigue: weeks 1, 2, 3, and 4** (end of AT intervention period)

Study details	Population	Aromatherapy intervention arm(s)	Comparator arm(s)	Outcomes (* = selected for synthesis)
Muzzarelli 2006 [235-S] **Country:** United States **Setting (detail):** day surgery (Same Day Surgery (SDS) department) **Study design:** parallel group	**No. randomised (age; sex):** 118 adults (52 years [mean]; 50% female) **Treatment goal:** relieve procedure-related side effects (GI endoscopy) **Inclusion criteria:** Scheduled for elective gastrointestinal endoscopic procedure **Exclusion criteria:** Documented psychosis, cognitive disorder or dementia **ICD code:** Gastrointestinal endoscopic procedures	**Name:** AT - lavender (inhalation) **What – essential oil & procedure:** lavender (10%, carrier: grapeseed oil) administered on a cotton ball in a 100 mL sterile cup held 8 - 10 cm from nose **When & how much:** 3 drops inhaled for 5 minutes after preparation, but before the procedure **Who administered (provider; AT training):** provider administered (NR; NR) **Co-intervention(s):** n/a	**Name:** inactive - placebo **What – materials & procedure:** grapeseed oil (100%) administered on a cotton ball in a 100 mL sterile cup held 8 - 10 cm from nose **When & how much:** 3 drops inhaled for 5 minutes after preparation, but before the procedure **Who administered (provider):** provider administered **No. arms included in synthesis (treatment & control):** 2 **Ineligible arms:** none	**Eligible outcomes:** Emotional functioning/mental health: preprocedural anxiety (STAI - state)* **Ineligible outcomes:** n/a **Timing of outcome measurement:** following procedural preparation (immediately after the AT intervention)*
Nagata 2014 [234-S] **Country:** Japan **Setting (detail):** hospital - outpatient (Outpatient-screening center) **Study design:** parallel group	**No. randomised (age; sex):** 224 adults (AT1. 52 years, AT2. 52, C1. 52, C2. 53 [mean]; AT1. 38% female. AT2. 38%, C1. 38%, C2. 38%) **Treatment goal:** relieve procedure-related side effects (CT colonography) **Inclusion criteria:** Scheduled for computed tomographic colonography (CTC); Asymptomatic **Exclusion criteria:** Previous colorectal surgery **ICD code:** Colorectal cancer screening (CT colonography)	**Name:** AT1 - bergamot (inhalation) + music AT2 - bergamot (inhalation) **What – essential oil & procedure:** AT1/AT2: bergamot (dilution NR) administered on scented gauze pad placed on pillow AT1: + music (see co-intervention comparator arm) **When & how much:** oil inhaled during procedure (volume of oil and procedure duration NR) **Who administered (provider; AT training):** provider administered (NR; NR) **Co-intervention(s):** see comparator arm	**Name:** C1 inactive control - music (co-intervention) C2 inactive - no intervention **What – materials & procedure:** C1-music administered through ceiling and pillow speakers C2-n/a **When & how much:** C1-music played during the procedure in treatment rooms (duration of procedure NR) C2-n/a **Who administered (provider):** C1-provider administered C2-n/a **No. arms included in synthesis (treatment & control):** 4 **Ineligible arms:** none	**Eligible outcomes:** Pain: periprocedural pain intensity (VAS)* **Ineligible outcomes:** Physiological function, signs and symptoms: SBP, DBP, HR **Timing of outcome measurement:** immediately following procedure (recall of procedural pain)*
Najafi 2014 [076-S] **Country:** Iran	**No. randomised (age; sex):** 70 adults (AT. 57 years [mean], C. 62; AT. 27% female, C. 34%) **Treatment goal:** relieve treatment-related side effects (CVD inpatient stress)	**Name:** AT - lavender (inhalation) **What – essential oil & procedure:** lavender (undiluted, carrier n/a), administered on a Kleenex and attached to collar	**Name:** inactive - usual care **What – materials & procedure:** routine care not described **When & how much:** **Who administered (provider):** n/a	**Eligible outcomes:** Emotional functioning/mental health: anxiety during hospitalisation (STAI - state)* **Ineligible outcomes:** n/a

Study details	Population	Aromatherapy intervention arm(s)	Comparator arm(s)	Outcomes (* = selected for synthesis)
Setting (detail): hospital - inpatient (Coronary care units) **Study design:** parallel group	**Inclusion criteria:** Diagnosed with myocardial infarction **Exclusion criteria:** Cardiopulmonary resuscitation; mental disorders; history of addiction; use of OTC tranquilisers; cardiac dysrhythmias; cardiogenic shock **ICD code:** BA41 Acute myocardial infarction	**When & how much:** 3 drops, 2 x 20 minutes daily for 2 days **Who administered (provider; AT training):** provider administered (research staff; NR) **Co-intervention(s):** n/a	**No. arms included in synthesis (treatment & control):** 2 **Ineligible arms:** none	**Timing of outcome measurement:** morning and evening* (20 minutes after the AT intervention) on days 2 and 3* of hospitalisation
Najafi 2017 [233-S] **Country:** Iran **Setting (detail):** hospital - inpatient (NR) **Study design:** parallel group	**No. randomised (age; sex):** 120 (A1. 31 years, A2. NR, C. 32 [mean]; 100% female) **Treatment goal:** relieve surgery-related side effects (caesarean section) **Inclusion criteria:** Scheduled for elective caesarean section; > 3 on 10-pt VAS 6 hrs after caesarean section **Exclusion criteria:** History of using analgesics **ICD code:** JB22.0 Delivery by elective caesarean section	**Name:** AT1 - chamomile (inhalation) AT2 - lavender (inhalation) **What – essential oil & procedure:** AT1. chamomile (5%, carrier: sesame oil) or AT2. lavender (% and carrier NR) administered on a cotton ball placed under their nose n/a **When & how much:** 2 drops of oil, once, 6 hrs after caesarean section n/a **Who administered (provider; AT training):** provider administered (NR; NR) **Co-intervention(s):** n/a	**Name:** inactive - placebo **What – materials & procedure:** saline administered on a cotton ball placed under their nose **When & how much:** 2 drops of saline, once, 6 hrs after caesarean section **Who administered (provider):** provider administered **No. arms included in synthesis (treatment & control):** 3 **Ineligible arms:** none	**Eligible outcomes:** Pain: postoperative pain intensity - early acute (VAS)*; postoperative pain relief - early acute **Ineligible outcomes:** n/a **Timing of outcome measurement:** average* of immediate post AT intervention and 15 mins post AT intervention
Namazi 2014.1 [232-S] **Country:** Iran **Setting (detail):** hospital - inpatient (Obstetrics ward) **Study design:** parallel group	**No. randomised (age; sex):** 122 participants (AT. 26 years, C. 27 [mean]; 100% female) **Treatment goal:** relieve symptoms of a condition (labour, first stage) **Inclusion criteria:** Primiparous pregnancy (in labour, full-term, singleton, cephalic presentation, 3 - 4 cm dilated, no complications); Intact amniotic sac **Exclusion criteria:** Use of painkillers within 8 hours of enrolling **ICD code:** Labour, first stage	**Name:** AT - bitter orange (inhalation) **What – essential oil & procedure:** bitter orange (8%, carrier: distilled water) administered on gauze square attached to collar area **When & how much:** 4 mL on gauze, with gauze replaced every 30 mins during first stage labour (mean duration NR) **Who administered (provider; AT training):** provider administered (NR; NR) **Co-intervention(s):** n/a	**Name:** inactive - placebo **What – materials & procedure:** saline on gauze square attached to collar **When & how much:** 4 mL on gauze, with gauze replaced every 30 mins during first stage labour (mean duration NR) **Who administered (provider):** provider administered **No. arms included in synthesis (treatment & control):** 2 **Ineligible arms:** none	**Eligible outcomes:** Pain: pain intensity (NRS)* [Namazi 2014.1] Emotional functioning/mental health: anxiety during labour (STAI - state)* [Namazi 2014.2] **Ineligible outcomes:** 'Other' pregnancy, puerperium and perinatal outcomes: frequency of contractions **Timing of outcome measurement:** Pain: cervical dilation 3-4 cm, 5-7 cm, 8-10 cm* EF/MH: cervical dilation 3-4 cm, 6-8 cm*

Study details	Population	Aromatherapy intervention arm(s)	Comparator arm(s)	Outcomes (* = selected for synthesis)
Nasiri 2016 [231-S] **Country:** Iran **Setting (detail):** community based (Home) **Study design:** parallel group	**No. randomised (age; sex):** 90 adults (AT. 56 years, C1. 57, C2. 57 [mean]; AT. 78% female, C1. 70%, C2. 73%) **Treatment goal:** relieve symptoms of a condition (knee OA) **Inclusion criteria:** Osteoarthritis of the knee, confirmed by rheumatologist, severity NR; Pain (=> 4 on VAS) **Exclusion criteria:** History of knee surgery or intra-articular steroid injections; OA in the hands and other areas; symptoms of acute infection in knee joint, prescribed physiotherapy for knee pain **ICD code:** FA01 Osteoarthritis of knee; ME82 Pain in joint (knee)	**Name:** AT - lavender (massage) **What – essential oil & procedure:** lavender (3%, carrier: sweet almond oil) administered by knee massage according to a protocol **When & how much:** 3 x 20-minute massage with 5 mL oil per week over 3 weeks (9 sessions) **Who administered (provider; AT training):** self-administered, provider prescribed (research staff; AT training) **Co-intervention(s):** usual care as per comparator arm	**Name:** C1 inactive control - massage (co-intervention) C2 inactive - usual care **What – materials & procedure:** C1-sweet almond oil administered by knee massage according to a protocol C2-all participants received similar medication, such as NSAIDs, acetaminophen, etc, administered by the rheumatologist **When & how much:** C1-3 x 20-minute massage with 5 mL oil per week over 3 weeks (9 sessions) C2-n/a **Who administered (provider):** C1-self-administered, provider prescribed C2-provider administered **No. arms included in synthesis (treatment & control):** 3 **Ineligible arms:** none	**Eligible outcomes:** Pain: knee pain overall (VAS)* [Nasiri 2016] Physical function: disability - global (WOMAC - global)* [Nasiri 2018] **Ineligible outcomes:** n/a **Timing of outcome measurement:** immediately after the 3-week AT intervention*, 1 and 4 weeks after the end of the AT intervention
Nasiri 2020 [095-S] **Country:** Iran **Setting (detail):** hospital - inpatient (Post-operative ward) **Study design:** parallel group	**No. randomised (age; sex):** 50 adults (AT. 37 years, C. 35 [mean]; AT. 75% female; C. 70%) **Treatment goal:** relieve procedure-related side effects (spinal anaesthesia) **Inclusion criteria:** Post-dural puncture headache; Spinal anaesthesia for elective surgeries **Exclusion criteria:** History of seizures; migraine headache, tension headaches; sinusitis and meningitis **ICD code:** 8A84.Y Other specified secondary headache (post-dural puncture headache, spinal anaesthesia)	**Name:** AT - lavender (inhalation) **What – essential oil & procedure:** lavender (2%, carrier n/a), 3 drops placed on upper lip with dropper **When & how much:** 1 x 15min **Who administered (provider; AT training):** provider administered (nurse clinically qualified; NR) **Co-intervention(s):** n/a	**Name:** inactive - placebo **What – materials & procedure:** liquid paraffin (undiluted, carrier n/a), 3 drops placed on upper lip with dropper **When & how much:** 1 x 15min **Who administered (provider):** provider administered **No. arms included in synthesis (treatment & control):** 2 **Ineligible arms:** none	**Eligible outcomes:** Pain: postoperative pain intensity - early acute (VAS)*; postoperative use of rescue medication (diclofenac analgesic) **Ineligible outcomes:** n/a **Timing of outcome measurement:** immediate*, 30, 60, 90, and 120 minutes after AT intervention
Nasiri Lari 2020 [230-S]	**No. randomised (age; sex):** 52 adults (AT (P1). 57 years, C (P1). 58 [mean])	**Name:** AT (P1) - lavender (inhalation)	**Name:** C (P1) inactive - placebo C (P2) inactive - placebo	**Eligible outcomes:**

Study details	Population	Aromatherapy intervention arm(s)	Comparator arm(s)	Outcomes (* = selected for synthesis)
Country: Iran **Setting (detail):** hospital - outpatient, community based (Diabetes clinic; home) **Study design:** crossover	**Treatment goal:** relieve symptoms of a condition (type 2 diabetes) **Inclusion criteria:** Type 2 diabetes mellitus (FBS 70 - 130 mg/dl; 2-hr postprandial glucose < 180 mg/dl; HbA1c < 7%); Chronic insomnia (PIRS > 5; > 3 months); **Exclusion criteria:** Systemic illness (except for diabetes, hypertension and high cholesterol); Psychiatric medications; Hospitalization or surgery within the previous month **ICD code:** 7A00 Chronic insomnia; 5A11 Type 2 diabetes mellitus	AT (P2) - lavender (inhalation) **What – essential oil & procedure:** lavender (% NR, carrier: NR) administered by on a 12 x 12 cm linen patch according to a deep breathing protocol **When & how much:** 3 drops oil for 5 minutes at bedtime over 4 weeks **Who administered (provider; AT training):** self-administered, provider prescribed (NR; NR) **Co-intervention(s):** n/a	**What – materials & procedure:** sweet almond administered by on a 12 x 12 cm linen patch according to a deep breathing protocol **When & how much:** 3 drops oil for 5 minutes at bedtime over 4 weeks **Who administered (provider):** self-administered, provider prescribed **No. arms included in synthesis (treatment & control):** 4 **Ineligible arms:** none	Sleep: sleep quality overall (PIRS-20 total score*; sleep quality and sleep quantity subdomains) HR-QoL: HRQoL overall (WHOQOL-BREF)* **Ineligible outcomes:** Emotional functioning/mental health: mood status (BDI); Physiological function, signs and symptoms: fasting blood sugar; Other: physical activity (IPAQ), caloric intake **Timing of outcome measurement:** end of 4-week AT intervention period*
Nazari 2016 [052-S] **Country:** Iran **Setting (detail):** hospital - inpatient (NR) **Study design:** parallel group	**No. randomised (age; sex):** 82 adults (AT. 40 years, C. 36; AT. 37% female, C. 24%) **Treatment goal:** relieve surgery-related side effects (orthopaedic surgery) **Inclusion criteria:** Scheduled for orthopaedic surgery (distal radius) **Exclusion criteria:** Use of anxiolytic medications **ICD code:** NC32.5Z Fracture of lower end of radius, unspecified (orthopaedic surgery)	**Name:** AT - lemon (inhalation) **What – essential oil & procedure:** lemon (% NR; carrier n/a), administered on non-absorbent cloth and attached to collar **When & how much:** 2 drops x 30 mins, at 8 hrs and 16 hrs after surgery (and 3 hrs after last injected sedatives) **Who administered (provider; AT training):** provider administered (NR; NR) **Co-intervention(s):** n/a	**Name:** inactive - usual care **What – materials & procedure:** usual care not described **When & how much:** n/a **Who administered (provider):** n/a **No. arms included in synthesis (treatment & control):** 2 **Ineligible arms:** none	**Eligible outcomes:** Pain: postoperative pain intensity - acute [16 hrs] (VAS)* **Ineligible outcomes:** n/a **Timing of outcome measurement:** 8 and 16* hrs postoperative (after each AT intervention)
Ndao 2012 [229-S] **Country:** United States **Setting (detail):** hospital - outpatient (Child and Adolescent Oncology Center) **Study design:** parallel group	**No. randomised (age; sex):** 30 children (AT. 13 years, C. 12 [mean]; AT. 24% female, C. 30%) **Treatment goal:** prevent treatment-related side effects (stem cell transplantation) **Inclusion criteria:** Scheduled for first stem cell transplantation (SCT); Malignant or non-malignant disorder; **Exclusion criteria:** Previously received SCT **ICD code:**	**Name:** AT - bergamot (inhalation) **What – essential oil & procedure:** bergamot (dilution NR) administered by vaporiser in treatment room beside bed **When & how much:** 4 drops per hour for the duration of procedure (approx. 1 hour) until 1 hour after procedure	**Name:** inactive - placebo **What – materials & procedure:** scented oil-based shampoo administered in vapouriser in treatment room beside bed **When & how much:** 4 drops per hour for the duration of procedure (approx. 1 hour) until 1 hour after procedure **Who administered (provider):** provider administered	**Eligible outcomes:** Pain: postprocedural pain - early acute (VAS; reported as proportion with any pain in 1st hour [severity score >0])* Nausea & vomiting: nausea within 1 hour postprocedurally (VAS; reported as proportion with any nausea [severity score >0])* Emotional functioning/mental health: postprocedural anxiety - early acute (STAI-CH - state) **Ineligible outcomes:** n/a

Study details	Population	Aromatherapy intervention arm(s)	Comparator arm(s)	Outcomes (* = selected for synthesis)
	Children undergoing stem cell transplantation (malignant & non-malignant disorders)	**Who administered (provider; AT training):** provider administered (research staff; NR) **Co-intervention(s):** n/a	**No. arms included in synthesis (treatment & control):** 2 **Ineligible arms:** none	**Timing of outcome measurement:** upon completion of infusion [mean 1 hour]; 1 hour following completion of the infusion (end of AT intervention period)*
Ni 2013 [153-S] **Country:** Taiwan **Setting (detail):** hospital - outpatient (Municipal hospital) **Study design:** parallel group	**No. randomised (age; sex):** 109 adults (AT. 45 years, C. 46 [mean]; AT. 62% female, C. 57%) **Treatment goal:** relieve surgery-related side effects (ambulatory surgery) **Inclusion criteria:** Scheduled for ambulatory surgery **Exclusion criteria:** Evidence of mental illness, preoperative use of sedatives, scheduled for major or high-risk surgery **ICD code:** Scheduled for ambulatory surgery	**Name:** AT - bergamot (inhalation) **What – essential oil & procedure:** bergamot (% dilution and carrier NR) administered by diffuser **When & how much:** 30 minutes in preparation room prior to surgery **Who administered (provider; AT training):** provider administered (NR; NR) **Co-intervention(s):** n/a	**Name:** inactive - placebo **What – materials & procedure:** water vapour administered by diffuser **When & how much:** 30 minutes in preparation room prior to surgery **Who administered (provider):** provider administered **No. arms included in synthesis (treatment & control):** 2 **Ineligible arms:** none	**Eligible outcomes:** Emotional functioning/mental health: preoperative anxiety (STAI - state)* [note: results reported by subgroup: prior experience with surgery yes/no; subgroups pooled for meta-analysis] **Ineligible outcomes:** Physiological function, signs and symptoms: SBP, DBP, HR **Timing of outcome measurement:** just before entering operating theatre (and immediately after AT intervention)*
Nikjou 2016 [301-S] **Country:** Iran **Setting (detail):** community based (Home) **Study design:** parallel group	**No. randomised (age; sex):** 200 adults (19 - 29 years [range]; 100% female) **Treatment goal:** relieve symptoms of a condition (dysmenorrhea) **Inclusion criteria:** Primary dysmenorrhea onset < 20 years with low-medium bleeding (no clots) **Exclusion criteria:** Severe/intolerable dysmenorrhea (limiting activities, not controllable by medicine); pelvic inflammatory disease/pelvic mass **ICD code:** GA34.3 Dysmenorrhoea	**Name:** AT - lavender (inhalation) **What – essential oil & procedure:** lavender (% and carrier NR) administered on a piece of cotton and inhaled **When & how much:** 3 drops of oil, once daily for 30 mins for the first 3 days of 2 menstrual cycles **Who administered (provider; AT training):** self-administered, provider prescribed (n/a; n/a) **Co-intervention(s):** n/a	**Name:** inactive - placebo **What – materials & procedure:** diluted milk (% and carrier NR) administered on a piece of cotton and inhaled **When & how much:** 3 drops of diluted milk, once daily for 30 mins for the first 3 days of 2 menstrual cycles **Who administered (provider):** self-administered, provider prescribed **No. arms included in synthesis (treatment & control):** 2 **Ineligible arms:** none	**Eligible outcomes:** Pain: pain intensity (VAS)* **Ineligible outcomes:** n/a **Timing of outcome measurement:** 1st menstrual cycle; 2nd menstrual cycle*
Noruzi Zamenjani 2020 [090-S] **Country:** Iran	**No. randomised (age; sex):** 120 participants (AT1. 29 years, AT2. 29 , C. 31 [mean]; AT1. 43% female, AT2. 38%, C. 43%)	**Name:** AT1 - damask rose (inhalation) AT2 - sweet orange (inhalation)	**Name:** inactive - placebo **What – materials & procedure:** distilled water administered on 10 x 10 cm gauze attached to the collar	**Eligible outcomes:** Pain: postoperative pain intensity - early acute (VAS)* **Ineligible outcomes:** n/a

Study details	Population	Aromatherapy intervention arm(s)	Comparator arm(s)	Outcomes (* = selected for synthesis)
Setting (detail): hospital - inpatient (Postanesthesia care unit) **Study design:** parallel group	**Treatment goal:** relieve surgery-related side effects (abdominal surgery) **Inclusion criteria:** Scheduled for open abdominal surgery **Exclusion criteria:** Postoperative complications; chronic pain; opioid addiction **ICD code:** Abdominal surgery	**What – essential oil & procedure:** AT1. damask rose or AT2. sweet orange (% NR, carrier n/a) administered on 10 x 10 cm gauze attached to the collar **When & how much:** 4 drops of oil inhaled for 30 mins after regaining consciousness **Who administered (provider; AT training):** provider administered (research staff; NR) **Co-intervention(s):** n/a	**When & how much:** 4 drops of water inhaled for 30 mins after regaining consciousness **Who administered (provider):** provider administered **No. arms included in synthesis (treatment & control):** 3 **Ineligible arms:** none	**Timing of outcome measurement:** 4*, 8 and 12 hrs after intervention
O'Connor 2013 [227-S] **Country:** Australia **Setting (detail):** aged care facility (Nursing home) **Study design:** crossover	**No. randomised (age; sex):** 66 elderly people (78 years [mean]; 59% female) **Treatment goal:** relieve symptoms of a condition (agitation, dementia) **Inclusion criteria:** Dementia (⩾ mild on CDRS); Physical agitation (several x day in daylight hours, requiring staff intervention); Nursing home resident ⩾3 months **Exclusion criteria:** Agitation primarily due to other factors (e.g. pain) Acute, life-threatening illness Psychotropic medication regime **ICD code:** 6D86.4 Agitation or aggression in dementia	**Name:** AT (P1) - lavender (topical) AT (P2) - lavender (topical) **What – essential oil & procedure:** lavender (30%, carrier: jojoba) administered to each forearm **When & how much:** 2 mL oil administered via 3 x 1-minute applications over 1 week (4-day washout) **Who administered (provider; AT training):** provider administered (nurse clinically qualified; NR) **Co-intervention(s):** n/a	**Name:** C (P1) inactive - placebo C (P2) - inactive - placebo **What – materials & procedure:** jojoba administered to each forearm **When & how much:** 2 mL oil administered 3 x 1-minute applications over 1 week (4-day washout) **Who administered (provider):** provider administered **No. arms included in synthesis (treatment & control):** 4 **Ineligible arms:** none	**Eligible outcomes:** Emotional functioning/mental health: episodes of agitated behaviour (count per 30 minutes, 'an episode' defined as observation of any agitated behaviour in a one-minute period)*; agitation (CMAI - result not reported); episodes of positive and negative affect (count per 30 minutes, affect coded using PGCARS) **Ineligible outcomes:** Other: cognitive function (MMSE - result not reported) **Timing of outcome measurement:** immediately after each of 3 AT treatments in one week (2 x 30-minute observation periods per treatment)
Olapour 2013 [061-S] **Country:** Iran **Setting (detail):** hospital - inpatient (NR) **Study design:** parallel group	**No. randomised (age; sex):** 60 adults (AT. 28 years; C. 26 [mean]; 100% female) **Treatment goal:** relieve surgery-related side effects (caesarean section) **Inclusion criteria:** Scheduled for caesarean delivery; Uncomplicated pregnancy **Exclusion criteria:** **ICD code:**	**Name:** AT - lavender (inhalation) **What – essential oil & procedure:** lavender (10%, carrier NR), 3 drops applied on cotton ball placed at distance of 10 cm **When & how much:** 1 x 5min at onset of postoperative pain, then again after 4, 8 and 12 hrs (note: diclofenac sodium administered if pain >3 on 10-pt	**Name:** inactive - placebo **What – materials & procedure:** base of aromatherapy blend without lavender (% and carrier NR), 3 drops applied on cotton ball placed at distance of 10 cm **When & how much:** 1 x 5min at onset of postoperative pain, then again after 4, 8 and 12 hrs	**Eligible outcomes:** Pain: postoperative pain intensity - early acute (VAS)*, postoperative use of rescue medication (diclofenac analgesic) **Ineligible outcomes:** Physiological function, signs and symptoms: BP, HR, dizziness **Timing of outcome measurement:** immediately after each AT administration (onset of postoperative pain*, then 4, 8 and 12 hrs after)

Study details	Population	Aromatherapy intervention arm(s)	Comparator arm(s)	Outcomes (* = selected for synthesis)
	JB22.0 Delivery by elective caesarean section	VAS after each AT intervention as per hospital protocol) **Who administered (provider; AT training):** provider administered (NR; NR) **Co-intervention(s):** n/a	(note: diclofenac sodium administered if pain >3 on 10-pt VAS after each AT intervention as per hospital protocol) **Who administered (provider):** provider administered **No. arms included in synthesis (treatment & control):** 2 **Ineligible arms:** none	
Ou 2012 [226-S] **Country:** Taiwan **Setting (detail):** community based (Home) **Study design:** parallel group	**No. randomised (age; sex):** 48 adults (AT. 25 years, C. 24 [mean]; 100% female) **Treatment goal:** relieve symptoms of a condition (dysmenorrhea) **Inclusion criteria:** Primary dysmenorrhea (>5 on 10-point NRS) **Exclusion criteria:** **ICD code:** GA34.3 Dysmenorrhoea	**Name:** AT - essential oil blend (massage) **What – essential oil & procedure:** lavender, clary sage, and marjoram in 2:1:1 ratio (3%, carrier: unscented jojoba cream) administered by massage to the lower abdomen **When & how much:** 2 g of cream daily for one menstrual cycle **Who administered (provider; AT training):** self-administered, provider prescribed (other; n/a) **Co-intervention(s):** n/a	**Name:** inactive control - massage (co-intervention) **What – materials & procedure:** synthetic fragrance (% NR, carrier: unscented jojoba cream) administered by massage to the lower abdomen **When & how much:** 2 g cream daily for one menstrual cycle **Who administered (provider):** self-administered, provider prescribed **No. arms included in synthesis (treatment & control):** 2 **Ineligible arms:** none	**Eligible outcomes:** Pain: pain intensity (NRS*, VRS) **Ineligible outcomes:** n/a **Timing of outcome measurement:** days 1, 2 and 3* of one menstrual cycle
Ou 2014 [300-S] **Country:** Taiwan **Setting (detail):** community based (Home) **Study design:** parallel group	**No. randomised (age; sex):** 60 adults (AT. 31 years, C. 26 [mean]); A1. 90% female, C. 77%) **Treatment goal:** relieve symptoms of a condition (neck pain) **Inclusion criteria:** Neck pain (Neck Disability Index > 10%) **Exclusion criteria:** Spinal deformities or herniated disks; cervical neural defects or spinal cord lesions; neck surgery or cervical spine fracture in previous 6 months; infections/fractures due to osteoporosis; physical therapy or medication during previous month.	**Name:** AT - essential oil blend (massage) **What – essential oil & procedure:** marjoram, black pepper, lavender, and peppermint in 2:2:1:1 ratio (3%, carrier: unscented cream) administered by massage to the neck and upper trapezius muscles **When & how much:** 2 g of cream daily after showering/bathing for 4 weeks **Who administered (provider; AT training):** self-administered, provider prescribed (research staff; n/a)	**Name:** inactive control - massage (co-intervention) **What – materials & procedure:** unscented cream administered by massage to the neck and upper trapezius muscles **When & how much:** 2 g of cream daily for 4 weeks **Who administered (provider):** self-administered, provider prescribed **No. arms included in synthesis (treatment & control):** 2 **Ineligible arms:** none	**Eligible outcomes:** Pain: pain overall (VAS)*; pressure threshold (Pressure Pain Threshold) Physical function: disability - global (NDI)* **Ineligible outcomes:** Other: dynamic range of motion **Timing of outcome measurement:** end of 4-week AT intervention*

Study details	Population	Aromatherapy intervention arm(s)	Comparator arm(s)	Outcomes (* = selected for synthesis)
	ICD code: MG30.02 Chronic primary musculoskeletal pain (neck)	**Co-intervention(s):** n/a		
Ovayolu 2014 [225-S] **Country:** Turkey **Setting (detail):** hospital - inpatient (Chemotherapy unit) **Study design:** parallel group	**No. randomised (age; sex):** 280 adults (AT1. 34%, AT2. 43%, C1. 27%, C2. 34% [40-49 years]; 100% female) **Treatment goal:** relieve procedure-related side effects (chemotherapy) **Inclusion criteria:** Receiving chemotherapy for breast cancer **Exclusion criteria:** Stage IV cancers; psychiatric problems **ICD code:** 2C6Z Malignant neoplasms of breast, unspecified (chemotherapy)	**Name:** AT1 - essential oil blend (inhalation) AT2 - essential oil blend (massage) **What – essential oil & procedure:** AT1-lavender, mint, chamomile, jasmine, violet, rosemary and eucalyptus (1.1% in sweet almond oil), administered on a sterile sponge and inhaled AT2-lavender, mint, chamomile, jasmine, violet, rosemary and eucalyptus (1.1% in sweet almond oil) administered by body massage according to a protocol **When & how much:** 3 x 5 minutes per week for 1 month 3 x 35-minute massage per week for 1 month **Who administered (provider; AT training):** self-administered, provider prescribed (NR; NR) **Co-intervention(s):** n/a	**Name:** C1 inactive - massage (co-intervention) C2 inactive - no intervention **What – materials & procedure:** C1-olive oil administered via massage as per protocol C2-n/a **When & how much:** C1-3 x 35-minute massage per week for 1 month C2-n/a **Who administered (provider):** C1-provider administered C2-n/a **No. arms included in synthesis (treatment & control):** 4 **Ineligible arms:** none	**Eligible outcomes:** HR-QoL: overall HR-QoL (RSCL - overall*; QoL scale [Turkish] - overall), HR-QoL domains (RSCL - psychological, physical; QoL scale [Turkish]: general well-being, physical symptoms and activity, sleep, appetite, sexual function, perception function, medical interaction, social relations and work performance) **Ineligible outcomes:** n/a **Timing of outcome measurement:** weeks 6* and 10 (2 and 6 weeks after end of AT intervention period respectively)
Ozel 2021 [352-S] **Country:** USA **Setting (detail):** hospital - inpatient (Procedure room) **Study design:** parallel group	**No. randomised (age; sex):** 80 adults (AT. 49 years, C. 48 [mean]; 100% female) **Treatment goal:** relieve procedure-related side effects (urodynamic testing) **Inclusion criteria:** Scheduled for urodynamic testing; Anxiety (VAS > 0) **Exclusion criteria:** **ICD code:** MB24.3 Anxiety (urodynamic testing)	**Name:** AT - lavender (inhalation) **What – essential oil & procedure:** lavender (undiluted, carrier n/a) applied on paper towel, placed 10 cm away from face **When & how much:** 2 drops inhaled immediately prior to and throughout the procedure **Who administered (provider; AT training):** provider administered (nurse clinically qualified; NR) **Co-intervention(s):** n/a	**Name:** inactive - placebo **What – materials & procedure:** distilled water, applied on paper towel, placed 10 cm away from face **When & how much:** 2 drops inhaled immediately prior to and throughout the procedure **Who administered (provider):** provider administered **No. arms included in synthesis (treatment & control):** 2 **Ineligible arms:** none	**Eligible outcomes:** Pain: periprocedural pain intensity (Wong-Baker pain scale)* Anxiety: periprocedural anxiety (VAS)* **Ineligible outcomes:** n/a **Timing of outcome measurement:** during the procedure (immediately after catheter placement)*, 15 minutes post-procedure

Study details	Population	Aromatherapy intervention arm(s)	Comparator arm(s)	Outcomes (* = selected for synthesis)
Ozkaraman 2018 [224-S] **Country:** Turkey **Setting (detail):** hospital - outpatient, community based (Chemotherapy unit; home) **Study design:** parallel group	**No. randomised (age; sex):** 70 adults (AT1. 58 years, AT2. 58, C. 60 [mean]; AT1. 80% female, AT2. 85%, C. 90%) **Treatment goal:** relieve procedure-related side effects (chemotherapy) **Inclusion criteria:** Cancer (multiple types); Receiving weekly chemotherapy **Exclusion criteria:** Past diagnosis of mental illness (anxiety, panic attacks, depression); chronic disease (cardiovascular disease, asthma) **ICD code:** 02 Neoplasms (chemotherapy)	**Name:** AT1 - lavender (inhalation) AT2 - tea tree (inhalation) **What – essential oil & procedure:** AT1. lavender or AT2. tea tree (dilution NR, carrier n/a) administered on a cotton patch attached to neck and shoulder area **When & how much:** 3 drops oil worn on patch during each session for 1 chemotherapy cycle, then for 5 mins every night for one month after completion of the cycle **Who administered (provider; AT training):** self-administered, provider prescribed (nurse clinically qualified; NR) **Co-intervention(s):** n/a	**Name:** inactive - no intervention **What – materials & procedure:** n/a **When & how much:** n/a **Who administered (provider):** n/a **No. arms included in synthesis (treatment & control):** 3 **Ineligible arms:** none	**Eligible outcomes:** Emotional functioning/mental health: postprocedural anxiety [time period post-chemotherapy cycle NR] (STAI - state* and trait) Sleep: sleep quality overall (PSQI)** **Ineligible outcomes:** n/a **Timing of outcome measurement:** STAI-state: after 1st AT intervention delivered during 1 chemotherapy cycle [time period post-chemotherapy cycle NR]* PSQI: after 2nd AT intervention delivered over 4 weeks at home**
Pasha 2012 [299-S] **Country:** Iran **Setting (detail):** community based (Home) **Study design:** parallel group	**No. randomised (age; sex):** 67 adults (AT. 25 years, C. 25 [mean]; 100% female) **Treatment goal:** relieve symptoms of a condition (N&V in pregnancy) **Inclusion criteria:** Pregnant (first trimester); Mild to moderate nausea and vomiting **Exclusion criteria:** Severe gestational nausea and vomiting Use of other medication for nausea and vomiting **ICD code:** Nausea and vomiting in pregnancy (NVP)	**Name:** AT - peppermint (inhalation) **What – essential oil & procedure:** peppermint (100% in water) in a bowl on the floor near bed **When & how much:** 4 drops for 4 consecutive nights **Who administered (provider; AT training):** self-administered, provider prescribed (research staff; NR) **Co-intervention(s):** n/a	**Name:** inactive - placebo **What – materials & procedure:** saline in bowl on floor by bed **When & how much:** 4 consecutive nights **Who administered (provider):** self-administered, provider prescribed **No. arms included in synthesis (treatment & control):** 2 **Ineligible arms:** none	**Eligible outcomes:** Nausea & vomiting: nausea severity (VAS), vomiting and retching episodes (no. per person)* **Ineligible outcomes:** n/a **Timing of outcome measurement:** mean of 4-day intervention period*, 7 days after the AT intervention period
Pasyar 2020 [056-S] **Country:** Iran **Setting (detail):** hospital - inpatient (NR)	**No. randomised (age; sex):** 60 adults (AT. 38 years, C. 38 [mean]; AT. 70% female, C. 67%) **Treatment goal:** prevent surgery-related side effects (laparoscopic cholecystectomy) **Inclusion criteria:** Scheduled for laparoscopic cholecystectomy	**Name:** AT - bergamot orange (inhalation) **What – essential oil & procedure:** bergamot orange (3%, carrier n/a) administered on cotton ball attached to collar area	**Name:** inactive - placebo **What – materials & procedure:** odourless grape seed oil administered on cotton ball attached to collar area **When & how much:** participants wore cotton ball with 2 drops of oil once for	**Eligible outcomes:** Emotional functioning/mental health: preoperative anxiety (STAI - state)* **Ineligible outcomes:** Physiological function, signs and symptoms: alpha amylase, salivary cortisol

Study details	Population	Aromatherapy intervention arm(s)	Comparator arm(s)	Outcomes (* = selected for synthesis)
Study design: parallel group	**Exclusion criteria:** History of psychiatric disorders; undergoing pharmacological treatment for anxiety; use of antidepressants **ICD code:** Laparoscopic cholecystectomy	**When & how much:** participants wore cotton ball with 2 drops of oil once for 20 mins, ~ 1 to 2 hours before the surgery **Who administered (provider; AT training):** provider administered (nurse clinically qualified; NR) **Co-intervention(s):** n/a	20 mins, ~ 1 to 2 hours before the surgery **Who administered (provider):** provider administered **No. arms included in synthesis (treatment & control):** 2 **Ineligible arms:** none	**Timing of outcome measurement:** ~1 to 2 hrs prior to surgery (immediately after AT intervention)*
Pehlivan 2019 [223-S] **Country:** Turkey **Setting (detail):** aged care facility (Nursing home) **Study design:** parallel group	**No. randomised (age; sex):** 90 adults (AT. 78 years, C1. 76, C2. 76 [mean]; AT. 60% female, C1. 60%, C2. 57%) **Treatment goal:** relieve symptoms of a condition (knee OA) **Inclusion criteria:** Knee osteoarthritis (at least 6 months); Pain (⩾; 4 on 10-point VAS); **Exclusion criteria:** Acute inflammation at the application site; knee joint surgery or drug (steroid, chloramine, hyaluronic acid) treatment in the last 6 months **ICD code:** FA01 Osteoarthritis of knee	**Name:** AT - ginger & rosemary (massage) **What – essential oil & procedure:** ginger & rosemary (2.5%, carrier: black seed oil) administered by lower extremity massage according to a protocol **When & how much:** 10 drops of each essential oil in 20 mL carrier massaged for 15 - 20 minutes twice weekly for 3 weeks (total 6 sessions) **Who administered (provider; AT training):** provider administered (research staff; NR) **Co-intervention(s):** n/a	**Name:** C1 inactive control - massage (co-intervention) C2 inactive - usual care **What – materials & procedure:** C1-knee massage with sunflower oil according to a protocol C2-NR **When & how much:** C1-15 - 20 minute massage twice weekly for 3 weeks (total 6 sessions) C2-n/a **Who administered (provider):** C1-provider administered C2-n/a **No. arms included in synthesis (treatment & control):** 3 **Ineligible arms:** none	**Eligible outcomes:** Pain: pain intensity (WOMAC - pain subscale*; OAKQOL - pain scale) Physical function: disability - global (WOMAC - physical functioning subscale*; OAKQOL - physical activities subscale) HRQoL: emotional wellbeing (OAKQOL - mental health domain)* **Ineligible outcomes:** Stiffness (WOMAC subscale); Other: social functioning (OAKQOL - social functionality and social support subscales) **Timing of outcome measurement:** week 4* (first measure after end of 3-week AT intervention period) and week 8
Petramfar 2016 [060-S] **Country:** Iran **Setting (detail):** hospital - outpatient (Policlinic) **Study design:** parallel group	**No. randomised (age; sex):** 92 adults (57 years [average]; 56% female) **Treatment goal:** relieve symptoms of a condition (neuropathic pain) **Inclusion criteria:** Neuropathic pain and feet burning; Moderate to severe pain ⩾ 6 mths; Dynamic tactile allodynia/hyperalgesia **Exclusion criteria:** Neuropathic or other types of pain without feet burning **ICD code:** 8E43.0 Neuropathic pain	**Name:** AT - ajwain (topical) **What – essential oil & procedure:** ajwain (10% o/w in cream), topical application **When & how much:** twice daily over 4 weeks **Who administered (provider; AT training):** self-administered, provider prescribed (NR; NR) **Co-intervention(s):** n/a	**Name:** inactive - placebo **What – materials & procedure:** almond oil (15% o/w in cream) applied topically **When & how much:** twice daily over 4 weeks **Who administered (provider):** self-administered, provider prescribed **No. arms included in synthesis (treatment & control):** 2 **Ineligible arms:** none	**Eligible outcomes:** Pain: neuropathic pain intensity - foot burning (VAS)*, numbness (VAS), allodynia (VAS), tingling (VAS) **Ineligible outcomes:** n/a **Timing of outcome measurement:** day 14 and 28* (end of AT intervention period)

Study details	Population	Aromatherapy intervention arm(s)	Comparator arm(s)	Outcomes (* = selected for synthesis)
Pimenta 2016 [297-S] **Country:** Brazil **Setting (detail):** hospital - outpatient (NR) **Study design:** parallel group	**No. randomised (age; sex):** 28 adults (45 years [mean]; % female NR) **Treatment goal:** relieve procedure-related side effects (bone marrow aspiration) **Inclusion criteria:** Chronic myeloid leukemia (CML); Low anxiety (20 - 40 on STAI - trait) **Exclusion criteria:** History of psychiatric illness **ICD code:** XH4XG8 Chronic myeloid leukaemia, NOS (bone marrow aspiration)	**Name:** AT - sweet orange (inhalation) **What – essential oil & procedure:** sweet orange (dilution and carrier NR) administered by electronic vapouriser **When & how much:** 10 mL oil was diffused for 30 minutes (timing of intervention and duration of procedure NR) **Who administered (provider; AT training):** provider administered (NR; NR) **Co-intervention(s):** n/a	**Name:** inactive - placebo **What – materials & procedure:** saline solution administered in electronic vaporiser **When & how much:** vapouriser used for 30 minutes (timing of intervention and duration of procedure NR) **Who administered (provider):** provider administered **No. arms included in synthesis (treatment & control):** 2 **Ineligible arms:** diazepam (10 mg)	**Eligible outcomes:** Emotional functioning/mental health: postprocedural anxiety - immediate (STAI - state)* **Ineligible outcomes:** Physiological function, signs and symptoms: SBP, DBP, CF, RF **Timing of outcome measurement:** immediate post-procedure*
Potter 2011 [222-S] **Country:** United States **Setting (detail):** hospital - outpatient (Ambulatory infusion clinic) **Study design:** parallel group	**No. randomised (age; sex):** 41 adults (65% aged 40 - 59 years; 25% aged 60 + years; AT. 37% female, C. 17%) **Treatment goal:** relieve treatment-related side effects (stem cell transplantation) **Inclusion criteria:** Scheduled for reinfusion of autologous hematopoietic progenitor cells (stem cell reinfusion, minimum 2 bags); **Exclusion criteria:** Previous stem cell reinfusions **ICD code:** 02 Neoplasms (autologous hematopoietic stem cell transplantation)	**Name:** AT - sweet orange (inhalation) **What – essential oil & procedure:** Sweet orange (dilution and carrier NR) administered in an 'aromatherapy sampler' **When & how much:** 3 drops of oil inhaled ad lib immediately prior to and during the procedure (duration = 2 bags of cells) [participants were encouraged to use their interventions at the first onset of symptoms, although some in AT group chose to use their intervention prophylactically] **Who administered (provider; AT training):** self-administered, provider prescribed (other; NR) **Co-intervention(s):** usual care as per comparator arm	**Name:** inactive - usual care **What – materials & procedure:** deep breaths **When & how much:** unspecified number of deep breaths immediately prior to and whenever feeling nauseated during procedure **Who administered (provider):** n/a **No. arms included in synthesis (treatment & control):** 2 **Ineligible arms:** Orange quarter to sniff or taste	**Eligible outcomes:** Nausea & vomiting: nausea severity (NRS: 0 to 10 point scale)* **Ineligible outcomes:** 'Other' symptoms: tickle/cough urge, combined tickle/cough/nausea **Timing of outcome measurement:** beginning of each new infusion bag (2 bags)* [reported as 'during infusion', ie nausea severity over bags 1 and 2]
Premkumar 2019 [294-S] **Country:** India	**No. randomised (age; sex):** 74 participants (21 years [mean]; 50% female) **Treatment goal:**	**Name:** AT1 - lavender (inhalation) AT2 - rose (inhalation)	**Name:** inactive - placebo	**Eligible outcomes:** Emotional functioning/mental health: preprocedural anxiety (Modified Dental Anxiety Scale (MDAS))*

Study details	Population	Aromatherapy intervention arm(s)	Comparator arm(s)	Outcomes (* = selected for synthesis)
Setting (detail): hospital - outpatient (Orthodontic department's waiting room) **Study design:** parallel group	(dental Tx) **Inclusion criteria:** Scheduled for orthodontic procedures **Exclusion criteria:** n/a **ICD code:** Dental treatment (adults)	**What – essential oil & procedure:** AT1. lavender or AT2. rose (% and carrier NR) placed in candle warmer and diffused into waiting room **When & how much:** for 15 minutes (before procedure) **Who administered (provider; AT training):** provider administered (NR; NR) **Co-intervention(s):** n/a	**What – materials & procedure:** water placed in candle warmer and diffused into waiting room **When & how much:** for 15 minutes (before procedure) **Who administered (provider):** provider administered **No. arms included in synthesis (treatment & control):** 3 **Ineligible arms:** none	**Ineligible outcomes:** Physiological function, signs and symptoms: SBP, DBP, HR **Timing of outcome measurement:** immediately after AT treatment (single 15-minute inhalation prior to dental procedure)*
Rafi 2020 [221-S] **Country:** Iran **Setting (detail):** hospital - inpatient (Cardiac intensive care unit) **Study design:** parallel group	**No. randomised (age; sex):** 70 adults (AT. 54 years, C. 55 [mean]; AT. 44% female, C. 56%) **Treatment goal:** relieve treatment-related side effects (CVD inpatient stress) **Inclusion criteria:** Acute coronary syndrome; Sleep disturbance, moderate and above (SMHSQ $\geqslant$ 21) **Exclusion criteria:** Severe pain or occurrence of any event in the ward leading to sleep disorders; mechanical ventilation and other complications **ICD code:** BA4Z Acute ischaemic heart disease, unspecified; MG41 Sleep disturbance (>= moderate)	**Name:** AT - lavender (inhalation) **What – essential oil & procedure:** lavender (20%, carrier n/a) administered on a cotton swab attached to pillow **When & how much:** 15 drops oil, duration and timing NR (likely overnight) **Who administered (provider; AT training):** provider administered (NR; NR) **Co-intervention(s):** n/a	**Name:** inactive - placebo **What – materials & procedure:** water administered on a cotton swab attached to pillow **When & how much:** 15 drops water, duration and timing NR (likely overnight) **Who administered (provider):** n/a **No. arms included in synthesis (treatment & control):** 2 **Ineligible arms:** none	**Eligible outcomes:** Sleep: sleep quality overall (SMHSQ - total)*; falling asleep time, wake time, rise time, overnight sleep duration, previous day sleep duration, sleep onset (SMHSQ questions 1 to 6) **Ineligible outcomes:** n/a **Timing of outcome measurement:** immediately after (likely) overnight AT intervention (i.e. morning)*
Rafii 2020 [220-S] **Country:** Iran **Setting (detail):** hospital - inpatient (Burns centre) **Study design:** parallel group	**No. randomised (age; sex):** 105 adults (AT. 36 years, C1. 37 C2. 40 [mean]; AT. 21% female, C1. 25%, C2. 34%) **Treatment goal:** relieve treatment-related side effects (burns inpatient stress) **Inclusion criteria:** Burns (2nd or 3rd degree, 10% to 45% of the body, at least 72 hours previously); Intact areas of skin on leg or back **Exclusion criteria:** Septicaemia, physical disability, self-inflicted burns	**Name:** AT - lavender & chamomile (massage) **What – essential oil & procedure:** lavender and chamomile (undiluted [2 drops each oil], carrier: grapeseed oil [30mL]) administered by massage on healthy skin according to a protocol	**Name:** C1 inactive control - massage (co-intervention) C2 inactive - usual care **What – materials & procedure:** C1-baby oil administered by massage on healthy skin according to a protocol C2-'Routine care' not described **When & how much:** C1-3 x 20-minute massage around bedtime (5 mL oil), over one week	**Eligible outcomes:** Sleep: sleep quality overall (PSQI - total)* Emotional functioning/mental health: anxiety during hospitalisation (STAI - state)* **Ineligible outcomes:** n/a **Timing of outcome measurement:** after 3rd (final) AT intervention*

Study details	Population	Aromatherapy intervention arm(s)	Comparator arm(s)	Outcomes (* = selected for synthesis)
	ICD code: NE2Z Burns, unspecified, involving 10 - 45 % of body surface, 2nd or 3rd degree	**When & how much:** 3 x 20-minute massage around bedtime (5 mL oil), over one week **Who administered (provider; AT training):** provider administered (research staff; NR) **Co-intervention(s):** n/a	C2-n/a **Who administered (provider):** C1-provider administered C2-n/a **No. arms included in synthesis (treatment & control):** 3 **Ineligible arms:** none	
Rambod 2020 [354-S] **Country:** Iran **Setting (detail):** hospital - inpatient (Coronary care unit) **Study design:** cluster randomised	**No. randomised (age; sex):** 100 adults (AT. 61 years, C. 62 [mean]; AT. 45% female, C. 44%) **Treatment goal:** relieve treatment-related side effects (CVD inpatient stress) **Inclusion criteria:** Acute myocardial infarction **Exclusion criteria:** Current or previous respiratory issues, psychological illness, previous cardiovascular issues or surgeries **ICD code:** BA41 Acute myocardial infarction	**Name:** AT - lemon (inhalation) **What – essential oil & procedure:** lemon (undiluted, carrier: n/a) administered on cotton pad 20cm from patient **When & how much:** 5 drops oil (replaced every 2 hours) for three consecutive days (10 hours per day) **Who administered (provider; AT training):** provider administered (research staff; AT training) **Co-intervention(s):** n/a	**Name:** inactive - placebo **What – materials & procedure:** paraffin oil administered on cotton pad 20cm from patient **When & how much:** 5 drops oil (replaced every 2 hours) for three consecutive days (10 hours per day) **Who administered (provider):** provider administered **No. arms included in synthesis (treatment & control):** 2 **Ineligible arms:** none	**Eligible outcomes:** Emotional functioning/mental health: anxiety during hospitalisation (STAI - state*, trait) **Ineligible outcomes:** Physiological function, signs and symptoms: SBP, DBP, HR, ST-segment, T wave, cardiac arrhythmia **Timing of outcome measurement:** morning of day 4 post-surgery (after 3-day AT intervention)*
Rashidi Fakari 2015.1 [198-S] **Country:** Iran **Setting (detail):** hospital - inpatient (Childbirth unit) **Study design:** parallel group	**No. randomised (age; sex):** 150 adults (AT1. 23, AT2. 20 [median], C. 21; 100% female) **Treatment goal:** relieve symptoms of a condition (labour, first stage) **Inclusion criteria:** Uncomplicated, singleton pregnancy; Cervical dilation 3 - 5 cm **Exclusion criteria:** Chronic diseases; use of anxiolytics for min. 3 hours before intervention; use of analgesics during intervention; foetal distress **ICD code:** Labour, first stage	**Name:** AT1 - geranium (inhalation) AT2 - orange (inhalation) **What – essential oil & procedure:** AT1. geranium or AT2. orange (2%, 1:1 in distilled water) administered on non-absorbent napkins, attached to collar **When & how much:** 2 drops for 20 minutes at cervical dilation of 3 - 5 cm **Who administered (provider; AT training):** provider administered (NR; NR) **Co-intervention(s):** n/a	**Name:** inactive - placebo **What – materials & procedure:** distilled water administered on non-absorbent napkins, attached to collar **When & how much:** 2 drops for 20 minutes at cervical dilation of 3 - 5 cm **Who administered (provider):** provider administered **No. arms included in synthesis (treatment & control):** 3 **Ineligible arms:** none	**Eligible outcomes:** Emotional functioning/mental health: anxiety during labour (STAI - state)* **Ineligible outcomes:** Physiological function, signs and symptoms: SBP, DBP, HR, RR **Timing of outcome measurement:** immediately after end of 20-min AT intervention*
Razaghi 2020	**No. randomised (age; sex):**	**Name:** AT - lavender (inhalation)	**Name:** inactive - no intervention	**Eligible outcomes:**

Study details	Population	Aromatherapy intervention arm(s)	Comparator arm(s)	Outcomes (* = selected for synthesis)
[085-S] **Country:** Iran **Setting (detail):** hospital - inpatient (Neonatology ward) **Study design:** parallel group	80 neonates (AT. 5.5 days, C. 5.5 [mean]; AT. 63% female, C. 53%) **Treatment goal:** relieve procedure-related side effects (phlebotomy <18yrs) **Inclusion criteria:** Term neonates with jaundice; Apgar score at 5 mins > 7 **Exclusion criteria:** Use of opioids, tranquilizers or sedatives during the last 24 h by mother or neonate, unsuccessful 1st phlebotomy attempt **ICD code:** Phlebotomy (neonatal)	**What – essential oil & procedure:** lavender (0.5% dilution with glycerin) administered on gauze pad in neonate's incubator **When & how much:** 10 drops of oil placed within 10 cm of head overnight prior to procedure and again during procedure **Who administered (provider; AT training):** provider administered (NR; NR) **Co-intervention(s):** n/a	**What – materials & procedure:** n/a **When & how much:** n/a **Who administered (provider):** n/a **No. arms included in synthesis (treatment & control):** 2 **Ineligible arms:** edible glucose	Pain: periprocedural pain intensity (DAN*, crying time) **Ineligible outcomes:** n/a **Timing of outcome measurement:** during procedure*
Rivaz 2021 [112-S] **Country:** Iran **Setting (detail):** community based (Home) **Study design:** parallel group	**No. randomised (age; sex):** 78 adults (53 years [mean]; 76% female) **Treatment goal:** relieve symptoms of a condition (neuropathic pain) **Inclusion criteria:** Diabetes mellitus; Neuropathic pain ($\geqslant$ 4 on 10-point DN4) **Exclusion criteria:** Other causes for neuropathic pain; diabetic ulcer **ICD code:** 8C03.0 Diabetic polyneuropathy	**Name:** AT - lavender (massage) **What – essential oil & procedure:** lavender (3%, carrier: sunflower oil) administered by massage to the lower leg (knee to feet) **When & how much:** 2.5 mL of oil for 10 mins, once daily for 4 weeks **Who administered (provider; AT training):** self-administered, provider prescribed (n/a; n/a) **Co-intervention(s):** n/a	**Name:** C1 inactive control - massage (co-intervention) C2 inactive - usual care **What – materials & procedure:** C1-sunflower oil administered by massage to the lower leg (knee to feet) C2-usual care not described **When & how much:** C1-2.5 mL of oil for 10 mins, once daily for 4 weeks C2-n/a **Who administered (provider):** C1-self-administered, provider prescribed C2-n/a **No. arms included in synthesis (treatment & control):** 3 **Ineligible arms:** none	**Eligible outcomes:** Pain: neuropathic pain (DN4, VAS*); pain severity (SF-36 pain dimension) Fatigue: severity of fatigue (SF-36; energy/fatigue dimension)* HR-QoL: overall HR-QoL (SF-36; general health dimension)* Physical function: physical function (SF-36; physical functioning dimension)* **Ineligible outcomes:** Emotional well-being (SF-36 dimension), role limitations - physical/emotional (SF-36 dimensions), social functioning (SF-36 dimension) **Timing of outcome measurement:** week 2 (midway through intervention period); week 4 (end of intervention period)*
Sadathosseini 2013 [218-S] **Country:** Iran **Setting (detail):** hospital - inpatient (Neonatology ward)	**No. randomised (age; sex):** 135 neonates (AT1. 5 days, AT2. 5, C. 5; AT1 49% female, AT2 53%, C. 55%) **Treatment goal:** relieve procedure-related side effects (phlebotomy <18yrs) **Inclusion criteria:** Hospitalised due to jaundice; 37 - 42 weeks GA at birth	**Name:** AT1 - vanillin (inhalation) [pre-exposure + during procedure] AT2 - vanillin (inhalation) [during procedure only] **What – essential oil & procedure:** vanillin (99%; diluted in 85% glycerol) ;	**Name:** inactive - no intervention **What – materials & procedure:** n/a **When & how much:** n/a **Who administered (provider):** n/a **No. arms included in synthesis (treatment & control):** 3	**Eligible outcomes:** Pain: periprocedural pain intensity (crying time)* **Ineligible outcomes:** Physiological function, signs and symptoms: HR, SaO2 **Timing of outcome measurement:** during procedure*

Study details	Population	Aromatherapy intervention arm(s)	Comparator arm(s)	Outcomes (* = selected for synthesis)
Study design: parallel group	**Exclusion criteria:** No neurologic, cardiac, and respiratory impairments and congenital anomalies; neonate not calm before data collection; administered sedatives or analgesics 24 hours before the procedure; unsuccessful first phlebotomy attempt **ICD code:** ME10.1 Unspecified jaundice (neonatal phlebotomy)	AT1 [pre-exposure]: administered on gauze pad placed in incubator 10 cm from head; AT1 + AT2 [during procedure]: administered on gauze pad held 1 cm from nose **When & how much:** AT1 [pre-exposure]: 10 drops overnight (mean duration 9 hrs); AT1 + AT2 [during procedure]: 10 drops during phlebotomy **Who administered (provider; AT training):** provider administered (NR; NR) **Co-intervention(s):** n/a	**Ineligible arms:** none	
Sadeghi 2020 [217-S] **Country:** Iran **Setting (detail):** hospital - inpatient (Burn unit) **Study design:** parallel group	**No. randomised (age; sex):** 120 participants (AT. 37 years, C1. 37, C2. 34 [mean]; AT. 30% female, C1. 38%, C2. 33%)) **Treatment goal:** relieve procedure-related side effects (dressing change, burns) **Inclusion criteria:** Second-degree burns < 30% of body surface; Pain > 3 on VAS; > 48 hrs since hospitalisation **Exclusion criteria:** Mental disorders Chronic pain **ICD code:** NE2Z Burns, unspecified, involving < 30% of body surface (dressing change)	**Name:** AT - damask rose (inhalation) **What – essential oil & procedure:** damask rose (40%, carrier n/a) administered on 4 x 4 cm gauze attached to collar **When & how much:** 6 drops, inhaled for 1 hr before dressing change **Who administered (provider; AT training):** provider administered (research staff; NR) **Co-intervention(s):** n/a	**Name:** C1 inactive - placebo C2 inactive - no intervention **What – materials & procedure:** C1-distilled water (100%, carrier n/a) administered on 4 x 4 cm gauze attached to collar C2-n/a **When & how much:** C1-6 drops, inhaled for 1 hr before dressing change C2-n/a **Who administered (provider):** C1-provider administered C2-n/a **No. arms included in synthesis (treatment & control):** 3 **Ineligible arms:** none	**Eligible outcomes:** Pain: postprocedural pain intensity - early acute (VAS)*, 4 - hour analgesic consumption Emotional functioning/mental health: preprocedural anxiety (STAI - state* and trait) **Ineligible outcomes:** n/a **Timing of outcome measurement:** immediately pre-procedure [anxiety]*, 15 mins post-procedure [pain]*, 4 hrs post-procedure
Sadeghi Aval Shahr 2015 [075-S] **Country:** Iran **Setting (detail):** community based (Dormitories)	**No. randomised (age; sex):** 50 participants (AT. 26 years, C. 25, [mean]; 100% female) **Treatment goal:** relieve symptoms of a condition (dysmenorrhoea) **Inclusion criteria:** Dysmenorrhoea;	**Name:** AT - rose (massage) **What – essential oil & procedure:** rose (4% dilution with almond oil) administered by abdominal self-massage according to training	**Name:** inactive control - massage (co-intervention) **What – materials & procedure:** almond oil administered by abdominal self-massage	**Eligible outcomes:** Pain: pain intensity (menstrual cramps, VAS)* **Ineligible outcomes:** n/a

Study details	Population	Aromatherapy intervention arm(s)	Comparator arm(s)	Outcomes (* = selected for synthesis)
Study design: parallel group	Menstrual pain > 5 on 10-point VAS **Exclusion criteria:** Use of analgesics Abnormal uterine bleeding **ICD code:** GA34.3 Dysmenorrhoea	**When & how much:** 5 drops massaged for 15 minutes on the first day of the menstruation for 2 menstrual cycles **Who administered (provider; AT training):** self-administered, provider prescribed (research staff; NR) **Co-intervention(s):** n/a	**When & how much:** 5 drops massaged for 15 minutes on the first day of the menstruation for 2 menstrual cycles **Who administered (provider):** self-administered, provider prescribed **No. arms included in synthesis (treatment & control):** 2 **Ineligible arms:** dry massage	**Timing of outcome measurement:** day 1, first and second* menstrual cycles (immediately after intervention)
Safajou 2020 [083-S] **Country:** Iran **Setting (detail):** community based (Health centres) **Study design:** parallel group	**No. randomised (age; sex):** 90 adults (AT. 27 years, C. 26 [mean]; 100% female) **Treatment goal:** relieve symptoms of a condition (N&V in pregnancy) **Inclusion criteria:** GA 6 - 16 weeks; Moderate nausea & vomiting (PUQE-24 score 3-12); Uncomplicated singleton pregnancy **Exclusion criteria:** Antiemetic use within 24hr **ICD code:** Nausea and vomiting in pregnancy (NVP)	**Name:** AT - lemon & peppermint (inhalation) **What – essential oil & procedure:** lemon and peppermint (each 5% in propylene glycol), 3 drops applied on cotton ball and inhaled 3 cm from nose, in 3 deep breaths **When & how much:** 1 x whenever feeling nauseous, repeated after 5 mins if necessary, over 4 days **Who administered (provider; AT training):** self-administered, provider prescribed (NR; NR) **Co-intervention(s):** n/a	**Name:** inactive - placebo **What – materials & procedure:** propylene glycol, 3 drops administered on cotton ball and inhaled at distance of 3 cm, in 3 deep breaths **When & how much:** 1 x whenever feeling nauseous, repeated after 5 mins if necessary, over 4 days **Who administered (provider):** self-administered, provider prescribed **No. arms included in synthesis (treatment & control):** 2 **Ineligible arms:** none	**Eligible outcomes:** Nausea & vomiting: nausea and vomiting severity (PUQE-24)* Fatigue: severity of fatigue (overall) (FSS)* **Ineligible outcomes:** n/a **Timing of outcome measurement:** Nausea & vomiting: days 1, 2, 3 and 4* of AT intervention period Fatigue: after 4-day AT intervention period*
Sahin 2021a [216-S] **Country:** Turkey **Setting (detail):** hospital - outpatient (Haemodialysis unit) **Study design:** parallel group	**No. randomised (age; sex):** 74 adults (AT. 51 years, C. 54 [mean]; AT. 47% female, C. 39%) **Treatment goal:** relieve procedure-related side effects (haemodialysis) **Inclusion criteria:** Undergoing haemodialysis 3 times a week; NRS score >=3 during AVF puncture **Exclusion criteria:** Use of painkillers 3 hrs before hemodialysis **ICD code:** QB94 Care involving dialysis	**Name:** AT - lavender (inhalation) **What – essential oil & procedure:** lavender (100%, carrier: boiled water), 5 drops mixed with boiled water and inhaled from distance of 30 cm **When & how much:** 1 x 5-min inhalation in the last hour of dialysis session; 3 sessions over 1 week **Who administered (provider; AT training):** provider administered (research staff; AT training) **Co-intervention(s):** n/a	**Name:** inactive - placebo **What – materials & procedure:** olive oil (undiluted, carrier n/a), 5 drops mixed with boiled water and inhaled at a distance of 30 cm **When & how much:** 1 x 5-min inhalation in the last hour of dialysis session; 3 sessions over 1 week **Who administered (provider):** provider administered **No. arms included in synthesis (treatment & control):** 2 **Ineligible arms:** none	**Eligible outcomes:** Pain: periprocedural pain intensity (NRS)* Emotional functioning / mental health: periprocedural anxiety (STAI; state anxiety*, trait anxiety) **Ineligible outcomes:** n/a **Timing of outcome measurement:** immediately post each of 3 AT interventions* (during last hour of dialysis; unclear whether pre- or post- needle insertion)

Study details	Population	Aromatherapy intervention arm(s)	Comparator arm(s)	Outcomes (* = selected for synthesis)
Sahin 2021b [293-S] **Country:** Turkey **Setting (detail):** hospital - inpatient (Intensive care unit) **Study design:** parallel group	**No. randomised (age; sex):** 45 adults (AT. 52 years, C1. 52, C2. 52 [mean]; 100% female) **Treatment goal:** relieve surgery-related side effects (gynaecologic surgery) **Inclusion criteria:** Scheduled for total abdominal hysterectomy and salpingooophorectomy **Exclusion criteria:** History of lymph node dissection; undergoing chemotherapy **ICD code:** Gynaecologic surgery	**Name:** AT - lavender (massage) **What – essential oil & procedure:** lavender (% and carrier NR) administered by hand massage according to a protocol **When & how much:** 1 x 20-min massage, 3 hrs after 1st postoperative analgesic **Who administered (provider; AT training):** provider administered (research staff; NR) **Co-intervention(s):** n/a	**Name:** C1 inactive - massage (co-intervention) C2 inactive - no intervention **What – materials & procedure:** C1-ultrasound gel (% and carrier n/a) administered by hand massage according to a protocol C2-n/a **When & how much:** C1-1 x 20-min massage, 3 hrs after 1st postoperative analgesic C2-n/a **Who administered (provider):** C1-provider administered C2-n/a **No. arms included in synthesis (treatment & control):** 3 **Ineligible arms:** none	**Eligible outcomes:** Pain: postoperative pain intensity - early acute (VRS)*; postoperative pain relief - early acute **Ineligible outcomes:** n/a **Timing of outcome measurement:** 30 mins*, 3 hrs after AT intervention
Saiyudthong 2009 [295-S] **Country:** Thailand **Setting (detail):** (NR) **Study design:** parallel group	**No. randomised (age; sex):** 40 adults (31 years [mean], 100% female) **Treatment goal:** relieve symptoms of a condition (distress) **Inclusion criteria:** Distress (GHQ-28 $\geqslant$ 6) **Exclusion criteria:** Receiving medication (medication type NR) **ICD code:** Distress (GHQ-28 >=6)	**Name:** AT - lime (massage) **What – essential oil & procedure:** lime (10%, carrier: NR) administered by massage **When & how much:** 1 x 1-hour massage **Who administered (provider; AT training):** provider administered (massage therapist; AT trained (certificate)) **Co-intervention(s):** n/a	**Name:** inactive - massage (co-intervention) **What – materials & procedure:** sweet almond oil (undiluted, carrier n/a) administered by massage **When & how much:** 1 x 1-hour massage **Who administered (provider):** provider administered **No. arms included in synthesis (treatment & control):** 2 **Ineligible arms:** none	**Eligible outcomes:** Emotional functioning/mental health: mental distress symptom severity (GHQ-28)* **Ineligible outcomes:** Physiological function, signs and symptoms: SBP, DBP, MAP, HR, maxillary temperature **Timing of outcome measurement:** week 4 (immediately after the final AT treatment)*
Sakamoto 2012 [192-S] **Country:** Japan **Setting (detail):** aged care facility (Nursing homes)	**No. randomised (age; sex):** 145 elderly (AT. 84 years, C. 84 [mean]: AT. 19% female, C. 18%) **Treatment goal:** prevent a condition among people with risk factors (falls prevention) **Inclusion criteria:** Residents of nursing homes	**Name:** AT - lavender (inhalation) **What – essential oil & procedure:** lavender (% and carrier n/a) administered as a 1 x 2 cm commercial patch, attached to collar area	**Name:** inactive - placebo **What – materials & procedure:** unscented 1 x 2 cm commercial patch, attached to collar area **When & how much:** 1 new patch every 24 hours for 360 days	**Eligible outcomes:** Emotional functioning/mental health: agitation (CMAI - overall score)* **Ineligible outcomes:** Activities of daily living (Barthel index); Falls (number over 12 months); Cognitive function (MMSE)

Study details	Population	Aromatherapy intervention arm(s)	Comparator arm(s)	Outcomes (* = selected for synthesis)
Study design: parallel group	**Exclusion criteria:** Pica disorders **ICD code:** XE498 Nursing home (over 65 at risk of falls, dementia)	**When & how much:** 1 new patch every 24 hours for 360 days **Who administered (provider; AT training):** provider administered (other; NR) **Co-intervention(s):** n/a	**Who administered (provider):** provider administered **No. arms included in synthesis (treatment & control):** 2 **Ineligible arms:** none	**Timing of outcome measurement:** 12 month (end of AT intervention period)*
Samadi 2021 [191-S] **Country:** Iran **Setting (detail):** hospital - inpatient (Psychiatric Clinic) **Study design:** parallel group	**No. randomised (age; sex):** 80 adults (41 years [median]; AT. 88% female, C. 85%) **Treatment goal:** relieve symptoms of a condition (depression) **Inclusion criteria:** Mild to moderate depression (HAMD-17 score 10-17); Sleep disturbance (PSQI score $\geqslant$ 5); Use of SSRI for < 3 weeks **Exclusion criteria:** Using traditional/ alternative medicine that affects sleep quality; using opiates; history of negative events in the past 6 months; migraine/chronic headache **ICD code:** SD82 Depression disorder (mild to moderate); MG41 Sleep disturbance	**Name:** AT - lavender (inhalation) **What – essential oil & procedure:** lavender (10% in almond oil) applied on 2 x 2 cm cotton gauze and attached to collar **When & how much:** 2 drops overnight, starting 1 hour before sleeping for 14 consecutive nights **Who administered (provider; AT training):** self-administered, provider prescribed (research staff; NR) **Co-intervention(s):** n/a	**Name:** inactive - placebo **What – materials & procedure:** almond oil (undiluted, carrier n/a) applied on 2 x 2 cm cotton gauze and attached to collar **When & how much:** 2 drops overnight, starting 1 hour before sleeping for 14 consecutive nights **Who administered (provider):** self-administered, provider prescribed **No. arms included in synthesis (treatment & control):** 2 **Ineligible arms:** none	**Eligible outcomes:** Sleep: sleep quality overall (PSQI - total)* **Ineligible outcomes:** n/a **Timing of outcome measurement:** day 15 (1 day after end of AT intervention period)*
Sapmaz 2015 [357-S] **Country:** Turkey **Setting (detail):** (NR) **Study design:** parallel group	**No. randomised (age; sex):** 100 adults (AT. 37 years, C. 38 [mean]; AT. 40% female, C. 42%) **Treatment goal:** relieve symptoms of a condition (renal colic) **Inclusion criteria:** Flank pain and kidney stones; **Exclusion criteria:** Renal dysfunction, use of NSAIDs within 24 hours **ICD code:** MF56 Renal colic	**Name:** AT - lavender (inhalation) **What – essential oil & procedure:** lavender (2% dilution in water) administered by electronic vapouriser in treatment room [both groups also received 75 mg intramuscular diclofenac routine care] **When & how much:** amount and duration NR **Who administered (provider; AT training):** provider administered (NR; NR) **Co-intervention(s):** n/a	**Name:** inactive - placebo **What – materials & procedure:** placebo (0.9% NaCl), administered by electronic vapouriser in treatment room **When & how much:** amount and duration NR **Who administered (provider):** provider administered **No. arms included in synthesis (treatment & control):** 2 **Ineligible arms:** none	**Eligible outcomes:** Pain: pain intensity (VAS)* **Ineligible outcomes:** Physiological function, signs and symptoms: MAP, HR **Timing of outcome measurement:** 10 and 30* minutes after treatment begin

Study details	Population	Aromatherapy intervention arm(s)	Comparator arm(s)	Outcomes (* = selected for synthesis)
Seddighi-Khavidak 2020 [292-S] **Country:** Iran **Setting (detail):** hospital - outpatient (Physical therapy clinic) **Study design:** parallel group	**No. randomised (age; sex):** 40 adults (AT. 46 years, C. 45 [mean]; AT. 67% female, C. 67%) **Treatment goal:** relieve symptoms of a condition (multiple sclerosis) **Inclusion criteria:** Multiple sclerosis (2010 revised McDonald criteria) for ⩾ 1 year; Able to stand independently for 30 seconds / walk 6 metres without aids; Balance score (BBS) 21 - 44 **Exclusion criteria:** Other musculoskeletal or cardiovascular problems that affect balance **ICD code:** 8A40.0 Relapsing-remitting multiple sclerosis; 8A40.2 Secondary progressive multiple sclerosis	**Name:** AT - lavender (inhalation) + exercise (co-intervention) **What – essential oil & procedure:** lavender (2%) administered on a 15 x 5 cm paper, worn as a mask during a VR exercise protocol **When & how much:** 0.3 mL per 10 x 45-minute exercise sessions, over 3 weeks **Who administered (provider; AT training):** provider administered (allied health practitioner; NR) **Co-intervention(s):** see comparator arm	**Name:** inactive control - exercise (co-intervention) **What – materials & procedure:** VR exercise program with 4 tasks (eye movement, head movement, positioning, postural stability) **When & how much:** 10 x 45-minute exercise sessions, over 3 weeks **Who administered (provider):** provider administered **No. arms included in synthesis (treatment & control):** 2 **Ineligible arms:** none	**Eligible outcomes:** HR-QoL: HR-QoL - psychological impact (MSIS-29 - psychological impact domain*; physical impact domain) Physical function: physical impact (MSIS-29 - physical impact domain*) **Ineligible outcomes:** muscle function (timed up and go); balance (Berg balance scale); fear of falling (fall efficacy scale - international) **Timing of outcome measurement:** day 20 (end of AT intervention period)*
Seifi 2014 [185-S] **Country:** Iran **Setting (detail):** hospital - inpatient (Intensive care unit) **Study design:** parallel group	**No. randomised (age; sex):** 70 adults (AT. 65 years, C. 66 [mean]; AT. 37% female; 23%) **Treatment goal:** relieve surgery-related side effects (CABG surgery) **Inclusion criteria:** Post-coronary artery bypass graft surgery; **Exclusion criteria:** Chronic respiratory disease; acute mental illness (previous diagnosis, taking medication or Spielberger's score < 20); acute severe pain; recovery complications (intubated > 24 hours, haemodynamic instability) **ICD code:** XA3B03 Coronary arteries disease (coronary artery bypass graft surgery)	**Name:** AT - lavender (inhalation) **What – essential oil & procedure:** lavender (2%, carrier: n/a) administered by absorbable patch in oxygen mask **When & how much:** 2 drops oil inhaled via mask for 20 mins on days 2 and 3 after surgery **Who administered (provider; AT training):** provider administered (research staff; NR) **Co-intervention(s):** n/a	**Name:** inactive - placebo **What – materials & procedure:** distilled water administered by absorbable patch in oxygen mask **When & how much:** 2 drops water inhaled via mask for 20 mins on days 2 and 3 after surgery **Who administered (provider):** provider administered **No. arms included in synthesis (treatment & control):** 2 **Ineligible arms:** none	**Eligible outcomes:** Pain: postoperative [chest] pain intensity - late acute [72 hrs] (VAS)* [Seifi 2018] Emotional functioning/mental health: postoperative anxiety - late acute [72 hrs] (STAI** - NR if total, state or trait subscale; DASS) [Seifi 2014] **Ineligible outcomes:** Physiological function, signs and symptoms: SBP, DBP, HR, RR, temperature **Timing of outcome measurement:** Pain: 5*, 30 and 60 mins after the AT intervention on days 2 and 3* after surgery EF/MH: 20 mins before and 20 mins after** the AT intervention on days 2 and 3** after surgery
Şentürk 2018 [215-S] **Country:** Turkey	**No. randomised (age; sex):** 41 adults (> 30 years; AT. 24% female, C. 47%) **Treatment goal:** relieve procedure-related side effects (haemodialysis)	**Name:** AT - lavender (inhalation) **What – essential oil & procedure:** lavender (undiluted, carrier n/a) administered on cotton patch	**Name:** inactive - no intervention **What – materials & procedure:** n/a **When & how much:** n/a	**Eligible outcomes:** Sleep: sleep quantity (study-specific questionnaire: total sleep time)*, time to sleep onset [sleep initiation] (study-specific

Study details	Population	Aromatherapy intervention arm(s)	Comparator arm(s)	Outcomes (* = selected for synthesis)
Setting (detail): community based (Home) **Study design:** parallel group	**Inclusion criteria:** Receiving haemodialysis (3 x week for ⩾ 6 months); Anxiety (HAM-A score ⩾ 6); Sleep disturbance (PSQI ⩾ 5) **Exclusion criteria:** n/a **ICD code:** QB94 Care involving dialysis; MG41 Sleep disturbance (significant); MB24.3 Anxiety (minor or above)	**When & how much:** 2 drops oil placed 15 - 20 cm from pillow 30 mins before bed (and left overnight) for 1 week **Who administered (provider; AT training):** self-administered, provider prescribed (research staff; AT training) **Co-intervention(s):** n/a	**Who administered (provider):** n/a **No. arms included in synthesis (treatment & control):** 2 **Ineligible arms:** none	questionnaire), daytime functioning (VAS, daytime sleepiness level) Emotional functioning/mental health: postprocedural anxiety [time period NR] (Hamilton Anxiety Rating Scale - total score*, psychological subscale, somatic subscale) **Ineligible outcomes:** n/a **Timing of outcome measurement:** after 1-week AT intervention*
Shahnazi 2012 [290-S] **Country:** Iran **Setting (detail):** hospital - outpatient (Health care center) **Study design:** parallel group	**No. randomised (age; sex):** 106 participants (AT. 28 years, C. 28 [mean]; 100% female) **Treatment goal:** relieve procedure-related side effects (IUD insertion) **Inclusion criteria:** Scheduled for IUD insertion; STAI-state score >30 **Exclusion criteria:** History of cervical surgery **ICD code:** Insertion of intrauterine contraceptive device	**Name:** AT - lavender (inhalation) **What – essential oil & procedure:** lavender (% NR, dilution with milk), 3 drops or more, administered on a cotton ball **When & how much:** 1 x 30 min before and during procedure **Who administered (provider; AT training):** self-administered, provider prescribed (n/a; n/a) **Co-intervention(s):** n/a	**Name:** inactive - placebo **What – materials & procedure:** milk (100%, carrier n/a), 3 drops or more, administered on a cotton ball **When & how much:** 1 x 30 min before and during procedure **Who administered (provider):** self-administered, provider prescribed **No. arms included in synthesis (treatment & control):** 2 **Ineligible arms:** none	**Eligible outcomes:** Pain: postprocedural pain intensity - early acute (VAS)* Emotional functioning/mental health: postprocedural anxiety - immediate (STAI - state)* **Ineligible outcomes:** Physiological function, signs and symptoms: SBP, DBP, HR **Timing of outcome measurement:** immediate post-procedure*
Shin 2007 [210-S] **Country:** South Korea **Setting (detail):** hospital - outpatient (Dept of Oriental Rehabilitation Medicine) **Study design:** parallel group	**No. randomised (age; sex):** 30 adults (AT. 61 years, C. 63 [mean]; AT. 60% female, C. 67%) **Treatment goal:** relieve symptoms of a condition (hemiplegic shoulder pain) **Inclusion criteria:** Hemiplegic shoulder pain after stroke; ⩽ grade 3 in motor power of hemiplegic upper extremity **Exclusion criteria:** Shoulder pain caused by conditions other than hemiplegia **ICD code:** MB53 Hemiplegia (shoulder pain)	**Name:** AT - essential oil blend + acupressure **What – essential oil & procedure:** rosemary, lavender, & peppermint in 2:1:1 ratio (diluted to 3% in jojoba oil) administered by acupressure at acupuncture points related to shoulder pain **When & how much:** 2 x 20 minute sessions daily for 2 weeks (total 28 sessions) **Who administered (provider; AT training):** provider administered (NR; NR)	**Name:** inactive control - acupressure (co-intervention) **What – materials & procedure:** Dry acupressure at acupuncture points related to shoulder pain **When & how much:** 2 x 20-minute acupressure sessions daily for 2 weeks (total 28 sessions) **Who administered (provider):** provider administered **No. arms included in synthesis (treatment & control):** 2 **Ineligible arms:** none	**Eligible outcomes:** Pain: [shoulder] pain intensity (VRS)* **Ineligible outcomes:** Physiological function, signs and symptoms: motor power **Timing of outcome measurement:** end of 2-week AT intervention period* (mean of 3-day post-intervention period)

Study details	Population	Aromatherapy intervention arm(s)	Comparator arm(s)	Outcomes (* = selected for synthesis)
		Co-intervention(s): see comparator arm		
Shirazi 2017 [189-S] **Country:** Iran **Setting (detail):** community based (Home) **Study design:** parallel group	**No. randomised (age; sex):** 120 adults (AT. 28 years, C1. 28, C2. 28 [mean]; 100% female) **Treatment goal:** relieve symptoms of a condition (LBP in pregnancy) **Inclusion criteria:** Uncomplicated pregnancy (12 - 33 weeks GA); Low back pain (⩾ 3 on 10-point VAS) **Exclusion criteria:** Pain other than musculoskeletal; pre-existing low back pain; use of analgesia **ICD code:** ME84.2 Low back pain (in pregnancy)	**Name:** AT - rose (topical) **What – essential oil & procedure:** rose (in almond oil, dilution NR) applied to painful area **When & how much:** 7 drops 2 x daily for 4 weeks **Who administered (provider; AT training):** self-administered, provider prescribed (n/a; n/a) **Co-intervention(s):** n/a	**Name:** C1 inactive - placebo C2 inactive - no intervention **What – materials & procedure:** C1-almond oil applied to painful area C2-n/a **When & how much:** C1-7 drops 2 x daily for 4 weeks C2-n/a **Who administered (provider):** C1-self-administered, self-prescribed C2-n/a **No. arms included in synthesis (treatment & control):** 3 **Ineligible arms:** none	**Eligible outcomes:** pain: overall pain intensity (VAS)* Physical function: physical functioning (RMDQ)* **Ineligible outcomes:** n/a **Timing of outcome measurement:** weeks 1 and 2 of treatment and week 6* (2 weeks after end of AT intervention period)
Shoara 2015 [289-S] **Country:** Iran **Setting (detail):** community based (Home) **Study design:** parallel group	**No. randomised (age; sex):** 66 adults (AT. 51years, C. 52 [mean]; AT. 93% female, C. 86%) **Treatment goal:** relieve symptoms of a condition (knee OA) **Inclusion criteria:** Knee osteoarthritis as per American College of Rheumatology criteria (grade 1-3 Kellgren-Lawrence Grading Scale) **Exclusion criteria:** Coexisting musculoskeletal diseases (e.g. RA); serious comorbidities (e.g. dermatologic disorder); previous surgery for knee replacement; steroid injections (IA within 3 months, IM within 1 month); hypersensitivity to diclofenac gel, chamomile-derived products; extensive use of analgesics (e.g. more than 2 g acetaminophen/day) **ICD code:** FA01 Osteoarthritis of knee	**Name:** AT - chamomile oil (topical) **What – essential oil & procedure:** chamomile (% NR, carrier: sesame oil) applied topically according to instructions [acetaminophen tablet (500 mg) as the rescue drug] **When & how much:** ~1.5 mL per application, 3 x applications daily for 3 weeks **Who administered (provider; AT training):** self-administered, provider prescribed (NR; NR) **Co-intervention(s):** usual care as per comparator arm	**Name:** inactive - placebo **What – materials & procedure:** pharmaceutical-grade paraffin applied topically according to instructions [acetaminophen tablet (500 mg) as the rescue drug] **When & how much:** ~1.5 mL per application, 3 x applications daily for 3 weeks **Who administered (provider):** self-administered, provider prescribed **No. arms included in synthesis (treatment & control):** 2 **Ineligible arms:** diclofenac gel 1%	**Eligible outcomes:** Pain: [knee] pain on walking (WOMAC - pain subscale)*; frequency of analgesic use (no. of acetaminophen tablets used) Physical function: disability - global (WOMAC - physical function subscale)* **Ineligible outcomes:** Stiffness (WOMAC - stiffness subscale) **Timing of outcome measurement:** weeks 1, 2 and 3* (end of AT intervention period)
Singh 2021	**No. randomised (age; sex):**	**Name:** AT - lavender (inhalation)	**Name:** inactive - placebo	**Eligible outcomes:**

Study details	Population	Aromatherapy intervention arm(s)	Comparator arm(s)	Outcomes (* = selected for synthesis)
[122-S] **Country:** United States **Setting (detail):** hospital - inpatient (academic tertiary care center) **Study design:** parallel group	144 adults (AT. 56 years, C. 60 [mean]; AT. 29% female, C. 39%) **Treatment goal:** prevent procedure-related side effects (interventional spinal procedures) **Inclusion criteria:** Scheduled for epidural steroid injection, medial branch block, or radiofrequency ablation **Exclusion criteria:** History of anxiety disorders, concurrent anxiolytic therapy **ICD code:** Interventional spinal procedures	**What – essential oil & procedure:** lavender (100%, carrier n/a) administered via Elequil aromatabs **When & how much:** one tab for 5 mins pre-procedure (tab dosage NR) **Who administered (provider; AT training):** provider administered (nurse clinically qualified; NR) **Co-intervention(s):** n/a	**What – materials & procedure:** Elequil aromatab without aroma/scent **When & how much:** one tab for 5 mins pre-procedure **Who administered (provider):** provider administered **No. arms included in synthesis (treatment & control):** 2 **Ineligible arms:** none	Emotional functioning/mental health: preprocedural anxiety (STAI-6)* **Ineligible outcomes:** Other: vasovagal episodes, aborted procedures **Timing of outcome measurement:** immediate pre-procedure*
Smallwood 2001 [048-S] **Country:** Scotland **Setting (detail):** hospital - inpatient (General hospital ward) **Study design:** parallel group	**No. randomised (age; sex):** 14 adults (67 years; 57% female) **Treatment goal:** relieve symptoms of a condition (BPSD) **Inclusion criteria:** Dementia (any cause) **Exclusion criteria:** n/a **ICD code:** 6D8Z Dementia, Unknown or Unspecified Cause	**Name:** AT - lavender (massage) **What – essential oil & procedure:** lavender (% and carrier NR) administered by massage. Procedure not reported. **When & how much:** 2 x massage per week over 4 weeks (8 sessions) **Who administered (provider; AT training):** provider administered (aromatherapist; NR) **Co-intervention(s):** n/a	**Name:** inactive control - massage (co-intervention) **What – materials & procedure:** plain oil massage (procedure and oil NR) **When & how much:** 2 x massage per week over 4 weeks (8 sessions) **Who administered (provider):** provider administered **No. arms included in synthesis (treatment & control):** 2 **Ineligible arms:** AT + conversation	**Eligible outcomes:** Emotional functioning/mental health: behavioural and psychological symptoms of dementia (SOT - motor behaviour*; SOT - inappropriate behaviour) **Ineligible outcomes:** Other activities: SOT - neutral behaviour; self care; receiving care; external engagement with social acivities etc **Timing of outcome measurement:** immediately after each AT Tx (average of measures after each of 8 Tx over 4 weeks)*
Stallings-Welden 2018 [174-S] **Country:** United States **Setting (detail):** day surgery (Postanaesthesia care unit; same day care centre) **Study design:** parallel group	**No. randomised (age; sex):** 221 adults (AT. 54 years, C. 51 [mean]; AT. 45% female, C. 68%) **Treatment goal:** relieve surgery-related side effects (day surgery) **Inclusion criteria:** Day surgery patients **Exclusion criteria:** n/a **ICD code:**	**Name:** AT - essential oil blend (inhalation) **What – essential oil & procedure:** spearmint, peppermint, ginger and lavender (% NR; carrier NR, commercial name: QueaseEASE) administered in a container **When & how much:** NR (participants encouraged to use as per manufacturer's instructions) **Who administered (provider; AT training):** self-administered,	**Name:** inactive - usual care **What – materials & procedure:** Medication prescribed by anaesthetist **When & how much:** n/a **Who administered (provider):** provider administered **No. arms included in synthesis (treatment & control):** 2 **Ineligible arms:** none	**Eligible outcomes:** Nausea & vomiting: early postoperative nausea (study specific severity scale; prior to same-day discharge)*; rescue antiemetics (number of doses) **Ineligible outcomes:** n/a **Timing of outcome measurement:** immediately after each episode of PONV in early postoperative period (mean of each measure reported)*

Study details	Population	Aromatherapy intervention arm(s)	Comparator arm(s)	Outcomes (* = selected for synthesis)
		provider prescribed (nurse clinically qualified; NR) **Co-intervention(s):** usual care as per comparator arm		
Stanley 2020 [205-S] **Country:** Singapore **Setting (detail):** (Day surgery preoperative area) **Study design:** parallel group	**No. randomised (age; sex):** 75 adults (AT. 62 years, C. 63 [mean]; AT. 56% female, C. 56%) **Treatment goal:** relieve surgery-related side effects (cataract surgery) **Inclusion criteria:** Scheduled for cataract surgery **Exclusion criteria:** History of mental illness, use of sedatives **ICD code:** 9B10 Cataract (surgery)	**Name:** AT - lavender (inhalation) **What – essential oil & procedure:** lavender (dilution and carrier NR) administered via diffusion in electric oil vaporizer **When & how much:** 20 drops of oil diffused into waiting room for 20 minutes, prior to surgery **Who administered (provider; AT training):** NR (NR; NR) **Co-intervention(s):** n/a	**Name:** inactive - placebo **What – materials & procedure:** grape seed oil diffused in electric oil vaporizer **When & how much:** 20 drops of oil diffused into waiting room for 20 minutes, prior to surgery **Who administered (provider):** NR **No. arms included in synthesis (treatment & control):** 2 **Ineligible arms:** none	**Eligible outcomes:** Emotional functioning/mental health: preoperative anxiety (STAI [subscale NR])* **Ineligible outcomes:** Physiological function, signs and symptoms: SBP, DBP, HR, RR. **Timing of outcome measurement:** immediately prior to entering the operating theatre*
Stevensen 1994 [184-S] **Country:** United Kingdom **Setting (detail):** hospital - inpatient (Intensive care unit) **Study design:** parallel group	**No. randomised (age; sex):** 75 participants (age and sex NR) **Treatment goal:** relieve surgery-related side effects (cardiac surgery) **Inclusion criteria:** Day 1 post-cardiac surgery; Extubated, receiving oxygen via a mask; Vital signs (HR, BP, RR) within set limits; ; **Exclusion criteria:** Requiring mechanical blood pressure or cardiac support (e.g. mechanical ventilation, cardiac pacing) **ICD code:** Cardiac surgery	**Name:** AT - neroli (massage) **What – essential oil & procedure:** neroli (2.5%, carrier: apricot kernel oil) administered by foot massage according to a protocol **When & how much:** 1 x 20-minute massage, day 1 postoperative **Who administered (provider; AT training):** provider administered (nurse clinically qualified, research staff; AT training) **Co-intervention(s):** usual care as per comparator arm	**Name:** C1 inactive control - massage (co-intervention) C2 inactive - usual care **What – materials & procedure:** C1-apricot kernel oil administered by foot massage according to a protocol C2-usual care: analgesia, mobilisation, chest physiotherapy **When & how much:** C1-1 x 20-minute massage, day 1 postoperative C2-NR **Who administered (provider):** C1-provider administered C2-NR **No. arms included in synthesis (treatment & control):** 3 **Ineligible arms:** none	**Eligible outcomes:** Emotional functioning/mental health: postoperative anxiety - late acute (STAI - state [modified])* **Ineligible outcomes:** Physiological function, signs and symptoms: SBP, DBP, HR, RR, MAP **Timing of outcome measurement:** immediately*, 1 and 2 hours after AT intervention (day 1 postoperative)
Tahmasebi 2019 [202-S]	**No. randomised (age; sex):** 105 adults (AT1. 60 years, AT2. 58, C. 59 [mean]; AT1. 64% female. AT2. 49%, C. 58%)	**Name:** AT1 - lavender (inhalation) AT2 - orange (inhalation)	**Name:** inactive - placebo **What – materials & procedure:** distilled water administered on non-absorbent	**Eligible outcomes:** Emotional functioning/mental health: preprocedural anxiety (STAI - state)*

Study details	Population	Aromatherapy intervention arm(s)	Comparator arm(s)	Outcomes (* = selected for synthesis)
Country: Iran **Setting (detail):** (Hospital) **Study design:** parallel group	**Treatment goal:** relieve procedure-related side effects (coronary angiography) **Inclusion criteria:** Scheduled for coronary angiography (first time); Anxiety **Exclusion criteria:** COPD, use of sedatives, analgesics or other medication (details NR) in 6 weeks prior to procedure **ICD code:** Coronary angiography	**What – essential oil & procedure:** AT1. lavender or AT2. orange (dilution and carrier NR) administered on non-absorbent polyethylene tissue paper attached to collar **When & how much:** participants wore patch with 2 drops of oil for 20 minutes one hour prior to procedure **Who administered (provider; AT training):** provider administered (medical practitioner; NR) **Co-intervention(s):** n/a	polyethylene tissue paper attached to collar **When & how much:** participants wore patch for 20 minutes one hour prior to procedure **Who administered (provider):** provider administered **No. arms included in synthesis (treatment & control):** 3 **Ineligible arms:** none	**Ineligible outcomes:** Physiological function, signs and symptoms: SBP, DBP, HR, RR **Timing of outcome measurement:** ~40 mins before the procedure (immediately after the AT intervention)*
Tanvisut 2018 [348-S] **Country:** Thailand **Setting (detail):** hospital - inpatient (Labour ward) **Study design:** parallel group	**No. randomised (age; sex):** 106 participants (AT. 27 years, C. 25 [mean]; 100% female) **Treatment goal:** relieve symptoms of a condition (labour, first stage) **Inclusion criteria:** Primiparous term pregnancy (first stage labour, spontaneous) **Exclusion criteria:** Caesarean delivery required **ICD code:** Labour, first stage	**Name:** AT - various oils (inhalation) **What – essential oil & procedure:** various (one of lavender, geranium rose, citrus or jasmine) (100%, carrier: water) administered by diffuser **When & how much:** 4 drops per 300 ml water during first stage of labour **Who administered (provider; AT training):** provider administered (NR; NR) **Co-intervention(s):** usual care as per comparator arm	**Name:** inactive - usual care **What – materials & procedure:** IV fluid hydration, uterotonic drugs, antibiotics, maternal/fetal monitoring, analgesic drug (meperidine) use on maternal request **When & how much:** n/a **Who administered (provider):** provider administered **No. arms included in synthesis (treatment & control):** 2 **Ineligible arms:** none	**Eligible outcomes:** Pain: pain intensity (NRS-11)*; use of pharmacological pain relief **Ineligible outcomes:** 'Other' pregnancy, puerperium and perinatal outcomes: labour augmentation, labour duration, mode of delivery, Apgar scores **Timing of outcome measurement:** 3 - 4 cm, 5 - 7 cm , 8 - 10 cm* cervical dilation
Taşan 2019 [347-S] **Country:** Turkey **Setting (detail):** hospital - outpatient (Haemodialysis unit) **Study design:** parallel group	**No. randomised (age; sex):** 60 adults (mean age NR; AT 67% female, C. 57%) **Treatment goal:** relieve procedure-related side effects (haemodialysis) **Inclusion criteria:** Regular haemodialysis **Exclusion criteria:** Analgesic within 3 hrs of haemodialysis	**Name:** AT - lavender (inhalation) **What – essential oil & procedure:** lavender (10%, carrier: sweet almond oil) administered on sponge 10 cm from nose **When & how much:** 3 drops inhaled for an average of 3-5 mins over 3 consecutive haemodialysis sessions	**Name:** inactive - no intervention **What – materials & procedure:** n/a **When & how much:** n/a **Who administered (provider):** n/a **No. arms included in synthesis (treatment & control):** 2 **Ineligible arms:** none	**Eligible outcomes:** Pain: periprocedural pain intensity (VAS)* **Ineligible outcomes:** n/a **Timing of outcome measurement:** after 3rd haemodialysis session*

Study details	Population	Aromatherapy intervention arm(s)	Comparator arm(s)	Outcomes (* = selected for synthesis)
	ICD code: QB94 Care involving dialysis	**Who administered (provider; AT training):** provider administered (research staff; NR) **Co-intervention(s):** n/a		
Tosun 2017 [183-S] **Country:** Turkey **Setting (detail):** community based (Home) **Study design:** parallel group	**No. randomised (age; sex):** 72 adults (AT. 65 years, C. 63 [mean]; AT. 94% female, C. 85%) **Treatment goal:** relieve symptoms of a condition (knee OA) **Inclusion criteria:** Osteoarthritis (grade 2-5 Ahlbäck system); Pain (> 4 on 10-point VAS); motion limitation **Exclusion criteria:** Lower extremity surgery in the last 6 months; intra-articular steroid injection to knee joint within 3 months; physiotherapy in the last 3 months or during the study; surgery for gonarthrosis **ICD code:** FA01 Osteoarthritis of knee	**Name:** AT - ginger (massage) **What – essential oil & procedure:** ginger oil (% NR, carrier: NR) administered by knee massage (plus usual care as per comparator arm) **When & how much:** 2 x 20-minute massage with 5 mL of oil weekly over 5 weeks **Who administered (provider; AT training):** self-administered, provider prescribed (nurse clinically qualified; NR) **Co-intervention(s):** usual care as per comparator arm	**Name:** inactive control - massage (co-intervention) **What – materials & procedure:** etofenamate (50 mg/1 gr gel twice daily) administered by knee massage; oral meloxicam (15 mg once a day); cold pack on the knee (3 x 15 minutes daily) [usual care received by AT and control group] In addition to usual care, the control group applied self-knee massage with etofenamate 50 mg/1 gr gel twice a week to avoid bias related to self-knee massage. **When & how much:** 2 x 20-minute massage weekly over 5 weeks **Who administered (provider):** self-administered, provider prescribed **No. arms included in synthesis (treatment & control):** 2 **Ineligible arms:** none	**Eligible outcomes:** Pain: [knee] pain intensity overall (VAS)*; pain on walking (WOMAC - pain subscale) Physical function: disability -global (WOMAC - physical function subscale*; WOMAC - total score) **Ineligible outcomes:** Stiffness (WOMAC subscale) **Timing of outcome measurement:** weeks 1 and 5* (end of AT intervention period)
Trambert 2017 [346-S] **Country:** United States **Setting (detail):** day surgery (Breast centre) **Study design:** parallel group	**No. randomised (age; sex):** 87 adults (50 years [mean]; 100% female) **Treatment goal:** relieve procedure-related side effects (core needle biopsy) **Inclusion criteria:** Scheduled for image-guided core needle biopsy for suspicion of breast cancer; **Exclusion criteria:** History of breast cancer **ICD code:** Image-guided core needle biopsy	**Name:** AT1 - lavender & sandalwood (inhalation) AT2 - orange & peppermint (inhalation) **What – essential oil & procedure:** AT1. lavender & sandalwood or AT2. orange & peppermint (undiluted, carrier n/a) administered on a 2.5 x 1.3 cm tab attached to front of gown at shoulder level	**Name:** inactive - placebo **What – materials & procedure:** unscented 2.5 x 1.3 cm tab attached to front of gown at shoulder level **When & how much:** 1 x 0.2 mL tab for the duration of the procedure (median exposure 64 mins) **Who administered (provider):** provider administered **No. arms included in synthesis (treatment & control):** 3	**Eligible outcomes:** Emotional functioning/mental health: postprocedural anxiety - immediate (STAI - state)* **Ineligible outcomes:** Physiological function, signs and symptoms: SBP, DBP, HR, RR **Timing of outcome measurement:** immediately after the procedure*

Study details	Population	Aromatherapy intervention arm(s)	Comparator arm(s)	Outcomes (* = selected for synthesis)
		When & how much: 1 x 0.2 mL tab for the duration of the procedure (median exposure 64 mins) **Who administered (provider; AT training):** provider administered (nurse clinically qualified; NR) **Co-intervention(s):** n/a	**Ineligible arms:** none	
Tugut 2017 [345-S] **Country:** Turkey **Setting (detail):** hospital - outpatient (Gynaecology and obstetrics outpatient clinic) **Study design:** parallel group	**No. randomised (age; sex):** 156 adults (AT 35 years, C. 34 [mean]; 100% female) **Treatment goal:** relieve procedure-related side effects (gynaecological examination) **Inclusion criteria:** Scheduled for gynaecological examination; **Exclusion criteria:** Not pregnant, no mental health problems such as anxiety, depression, panic attacks, bipolar affective disorder or schizophrenia **ICD code:** Gynaecological examination	**Name:** AT - lavender (inhalation) **What – essential oil & procedure:** lavender (10%, carrier: NR) administered via diffuser in examination room **When & how much:** 15 cm from examination table for 10-15 mins during procedure (amount NR) **Who administered (provider; AT training):** provider administered (research staff; NR) **Co-intervention(s):** n/a	**Name:** inactive - no intervention **What – materials & procedure:** n/a **When & how much:** n/a **Who administered (provider):** n/a **No. arms included in synthesis (treatment & control):** 2 **Ineligible arms:** none	**Eligible outcomes:** Pain: postprocedural pain intensity - early acute (VAS)* Emotional functioning/mental health: periprocedural anxiety (STAI state)* **Ineligible outcomes:** n/a **Timing of outcome measurement:** after gynaecological examination*
Tüzün Özdemir 2021 [182-S] **Country:** Turkey **Setting (detail):** hospital - outpatient (hemodialysis unit) **Study design:** parallel group	**No. randomised (age; sex):** 60 adults (AT. 51 years, C. 62 [mean]; AT. 57% female, C. 43%) **Treatment goal:** relieve procedure-related side effects (haemodialysis) **Inclusion criteria:** Hemodialysis for at least 6 months; with arteriovenous fistula **Exclusion criteria:** Use of analgesics in the past 3 hours **ICD code:** QB94 Care involving dialysis	**Name:** AT - lavender (inhalation) **What – essential oil & procedure:** lavender (10%, carrier: distilled water) administered on a piece of cotton and inhaled from 10 cm **When & how much:** 1 x 5-min inhalation immediately preceding each of 3 dialysis sessions over 1 week (72 hours apart) **Who administered (provider; AT training):** provider administered (nurse clinically qualified; NR) **Co-intervention(s):** n/a	**Name:** inactive - usual care **What – materials & procedure:** usual care not described **When & how much:** n/a **Who administered (provider):** n/a **No. arms included in synthesis (treatment & control):** 2 **Ineligible arms:** none	**Eligible outcomes:** pain: periprocedural pain intensity (VAS)*; pain intensity (Verbal Descriptor Scale) **Ineligible outcomes:** n/a **Timing of outcome measurement:** immediately after cannulation at each of 3 dialysis sessions (~ 0, 72 and 144* hours; AT prior to cannulation)
Usta 2021 [361-S]	**No. randomised (age; sex):**	**Name:** AT - lavender (inhalation)	**Name:** inactive - placebo	**Eligible outcomes:**

Study details	Population	Aromatherapy intervention arm(s)	Comparator arm(s)	Outcomes (* = selected for synthesis)
Country: Turkey **Setting (detail):** hospital - inpatient (Neonatal intensive care unit) **Study design:** parallel group	76 infants (AT. 5 days, C. 5 days [mean]; AT. 61% female, C. 67%) **Treatment goal:** relieve procedure-related side effects (heel prick test) **Inclusion criteria:** Premature infants (24 - 37 GA); Scheduled for heel lancing **Exclusion criteria:** Babies with chromosomal anomalies, craniofacial malformation, neonatal seizures, intracranial hemorrhage (grade III-IV), or perinatal asphyxia; babies on sedatives, muscle relaxants and anti-epileptics; mothers with a history of substance use **ICD code:** KA21.4 Preterm newborn (Heel prick test; PKU screening)	**What – essential oil & procedure:** lavender (% and carrier NR), administered on cotton bud, placed near nostrils **When & how much:** 6 drops, inhaled for 3 minutes before procedure, during procedure, and 30 seconds after procedure **Who administered (provider; AT training):** provider administered (nurse clinically qualified; NR) **Co-intervention(s):** n/a	**What – materials & procedure:** distilled water, administered on cotton bud, placed near nostrils **When & how much:** 6 drops, inhaled for 3 minutes before procedure, during procedure, and 30 seconds after procedure **Who administered (provider):** provider administered **No. arms included in synthesis (treatment & control):** 2 **Ineligible arms:** none	Pain: periprocedural pain intensity (PIPP-R)* **Ineligible outcomes:** n/a **Timing of outcome measurement:** during procedure, 3 minutes* after procedure
Uysal 2016 [344-S] **Country:** Turkey **Setting (detail):** hospital - emergency (Emergency ward) **Study design:** parallel group	**No. randomised (age; sex):** 105 adults (AT. 21 years, C. 21 [mean]; 100% female) **Treatment goal:** relieve symptoms of a condition (dysmenorrhoea) **Inclusion criteria:** Primary dysmenorrhea; Pain > 5 on 10-point VAS **Exclusion criteria:** NSAID usage in the last 24 h **ICD code:** GA34.3 Dysmenorrhoea	**Name:** AT - rose (inhalation) **What – essential oil & procedure:** rose (2%, carrier NR) administered via an electronic vaporiser [note: both groups were also administered diclofenac sodium 75 mg IM] **When & how much:** 1 m above the patient 'set to continuously spray every 10 min' during admission in ED (mean duration NR) **Who administered (provider; AT training):** provider administered (NR; NR) **Co-intervention(s):** n/a	**Name:** inactive - placebo **What – materials & procedure:** saline administered via an electronic vaporiser **When & how much:** 1 m above the patient 'set to continuously spray every 10 min' during admission in ED (mean duration NR) **Who administered (provider):** provider administered **No. arms included in synthesis (treatment & control):** 2 **Ineligible arms:** none	**Eligible outcomes:** Pain: pain intensity (VAS)* **Ineligible outcomes:** Physiological function, signs and symptoms: SDP, DBP, MAP, HR, RR **Timing of outcome measurement:** 0 mins, 30 mins* post-treatment
Uzunçakmak 2018 [343-S] **Country:** Turkey **Setting (detail):** community based (Student residence)	**No. randomised (age; sex):** 90 participants (age NR; 100% female) **Treatment goal:** relieve symptoms of a condition (premenstrual syndrome) **Inclusion criteria:** Premenstrual syndrome (PMS score > 110); Experiencing more than five symptoms of PMS every month	**Name:** AT - lavender (inhalation) **What – essential oil & procedure:** lavender (undiluted, carrier: 200 mL hot water), steam inhaled **When & how much:** 3 drops once daily for at least 7 days before	**Name:** inactive - no intervention **What – materials & procedure:** n/a **When & how much:** n/a **Who administered (provider):** n/a	**Eligible outcomes:** Fatigue: fatigue (Premenstrual Syndrome Scale (PMS) - fatigue subdomain)* **Ineligible outcomes:** Overall menstrual symptoms: premenstrual symptom severity (PMS - overall score; pain and swelling subdomains).

Study details	Population	Aromatherapy intervention arm(s)	Comparator arm(s)	Outcomes (* = selected for synthesis)
Study design: parallel group	**Exclusion criteria:** Chronic disease, use of any interventions for PMS **ICD code:** GA34.40 Premenstrual tension syndrome	menstruation [average was 5 days], over one cycle **Who administered (provider; AT training):** self-administered, provider prescribed (research staff; NR) **Co-intervention(s):** n/a	**No. arms included in synthesis (treatment & control):** 2 **Ineligible arms:** none	Emotional functioning/mental health: mental distress (PMS - anxiety, depressive affect, nervousness, depressive thoughts subdomains) **Timing of outcome measurement:** end of AT intervention period (2nd or 3rd menstrual cycle; exact timing unclear)
Vakilian 2018 [054-S] **Country:** Iran **Setting (detail):** hospital - inpatient (Labor room) **Study design:** parallel group	**No. randomised (age; sex):** 120 participants (AT. 26 years, C. 26 [mean]; 100% female) **Treatment goal:** relieve symptoms of a condition (labour, first stage) **Inclusion criteria:** Uncomplicated labour; Cervical dilation > 4cm **Exclusion criteria:** SDP < 95 mmHg; bleeding; caesarean section **ICD code:** Labour, first stage	**Name:** AT - lavender (inhalation) **What – essential oil & procedure:** lavender (1.5%, carrier NR) administered via nebulizer connected to mask, no additional mixing with water **When & how much:** participants wore nebulizer throughout 1st stage of labour (mean duration 8hrs) **Who administered (provider; AT training):** provider administered (other; NR) **Co-intervention(s):** n/a	**Name:** inactive - placebo **What – materials & procedure:** sterile water administered via nebulizer connected to a mask **When & how much:** participants wore nebulizer throughout 1st stage of labour (mean duration 9hrs) **Who administered (provider):** provider administered **No. arms included in synthesis (treatment & control):** 2 **Ineligible arms:** none	**Eligible outcomes:** Pain: pain intensity (VAS)* **Ineligible outcomes:** 'Other' pregnancy, puerperium and perinatal outcomes: duration of 1st and 2nd stage of labour **Timing of outcome measurement:** cervical dilation 4-6cm; 7-8cm; 9-10cm*; overall 1st stage of labour
van Dijk 2018 [342-S] **Country:** South Africa **Setting (detail):** hospital - inpatient (Burns unit) **Study design:** parallel group	**No. randomised (age; sex):** 287 children (AT. 25 months, C1. 29, C2. 25 [median]; AT. 51% female, C1. 50%, C2. 47%) **Treatment goal:** relieve symptoms of a condition (burns) **Inclusion criteria:** Admission to burn unit; Burn incident < 1 week ago **Exclusion criteria:** Extensive burnt skin (% NR) **ICD code:** NE2Z Burns, unspecified (paediatric)	**Name:** AT - essential oil blend (massage) **What – essential oil & procedure:** chamomile, lavender & neroli (1% in grapeseed oil), administered via body massage according to a protocol **When & how much:** up to 5 massages in 2-week period, duration 10 - 20 minutes **Who administered (provider; AT training):** provider administered (aromatherapist; AT training) **Co-intervention(s):** n/a	**Name:** C1 inactive - massage (co-intervention) C2 inactive - no intervention **What – materials & procedure:** C1-grapeseed oil (undiluted, carrier n/a) administered via body massage according to a protocol C2-n/a **When & how much:** C1-up to 5 massages in 2-week period, duration 10 - 20 minutes C2-n/a **Who administered (provider):** C1-provider administered C2-n/a	**Eligible outcomes:** Pain: burns pain intensity (COMFORT-B scale*; VAS - nurse rated) **Ineligible outcomes:** Other symptoms: levels of relaxation (muscle tension inventory; behavioural relaxation scale); Physiological function, signs and symptoms: HR, SaO2 **Timing of outcome measurement:** immediately after each AT treatment (up to 5 treatments, mean score for all measures)*

Study details	Population	Aromatherapy intervention arm(s)	Comparator arm(s)	Outcomes (* = selected for synthesis)
			No. arms included in synthesis (treatment & control): 3 **Ineligible arms:** none	
Varaei 2020 [341-S] **Country:** Iran **Setting (detail):** hospital - inpatient (Haemodialysis care units) **Study design:** parallel group	**No. randomised (age; sex):** 96 adults (47.9% [41-59 years]; 43% female) **Treatment goal:** relieve procedure-related side effects (haemodialysis) **Inclusion criteria:** Haemodialysis history of ⩾ 1 year; 3 haemodialysis sessions per week **Exclusion criteria:** Use of sedatives; opioid addiction, chronic diseases including mental disorders; kidney transplant **ICD code:** QB94 Care involving dialysis	**Name:** AT1 - lavender & sweet orange (inhalation) AT2 - lavender & sweet orange (massage) **What – essential oil & procedure:** lavender and sweet orange (undiluted, carrier n/a), administered on a 2 x 2cm gauze and attached to shirt collar lavender and sweet orange (1:1 ratio, 3% in sweet almond oil) administered by foot massage **When & how much:** 1 drop of each oil, 3 x 20 minutes per week for 8 weeks (24 sessions) 10 mL, 3 x 20 minutes per week for 8 weeks (24 sessions) **Who administered (provider; AT training):** provider administered (NR; NR) **Co-intervention(s):** usual care as per comparator arm	**Name:** inactive - usual care **What – materials & procedure:** usual care not described **When & how much:** n/a **Who administered (provider):** n/a **No. arms included in synthesis (treatment & control):** 3 **Ineligible arms:** none	**Eligible outcomes:** Fatigue: fatigue severity (Rhoten fatigue scale)* [Varaei 2020] HR-QoL: HR-QoL (Kidney Disease Quality of Life Short Form [KDQOL-SF 1.3], subscales NR)* [Jalalian 2015] **Ineligible outcomes:** n/a **Timing of outcome measurement:** end of week 8 (end of AT intervention period*) and week 16
Vaziri 2017 [082-S] **Country:** Iran **Setting (detail):** hospital - inpatient (Postpartum wards) **Study design:** parallel group	**No. randomised (age; sex):** 62 participants (24 years [mean]; 100% female) **Treatment goal:** relieve symptoms of a condition (acute postpartum period) **Inclusion criteria:** Singleton pregnant women undergoing vaginal delivery with episiotomy; Perineal pain score ⩾ 4 on 10-point VAS;; **Exclusion criteria:** Spinal or epidural anesthesia **ICD code:** Normal childbirth (acute postpartum period)	**Name:** AT - lavender (inhalation) **What – essential oil & procedure:** lavender (1%, carrier NR) administered on a cotton ball and inhaled at a distance of 20 cm **When & how much:** 2 x 5 drops of oil for 10-15 min (immediately post delivery and 6 hrs post delivery) **Who administered (provider; AT training):** provider administered (research staff; NR) **Co-intervention(s):** n/a	**Name:** inactive - placebo **What – materials & procedure:** sesame oil (100%) administered on a cotton ball and inhaled at a distance of 20 cm **When & how much:** 2 x 5 drops of oil for 10-15 min (immediately post delivery and 6 hrs post delivery) **Who administered (provider):** provider administered **No. arms included in synthesis (treatment & control):** 2 **Ineligible arms:** none	**Eligible outcomes:** Pain: postpartum pain intensity (perineal) (VAS); postpartum pain intensity (back pain, muscle pain, uterine cramps) (VAS)* Emotional functioning/mental health: postpartum mood - immediate (PANAS negative* and positive affect); perinatal distress (VAS) **Ineligible outcomes:** Fatigue: fatigue (VAS) **Timing of outcome measurement:** 1 hour after 1st AT intervention, morning after 2nd AT intervention*

Study details	Population	Aromatherapy intervention arm(s)	Comparator arm(s)	Outcomes (* = selected for synthesis)
Vaziri 2019 [087-S] **Country:** Iran **Setting (detail):** hospital - outpatient (Health centre) **Study design:** parallel group	**No. randomised (age; sex):** 97 infants (2 months, % female NR) **Treatment goal:** relieve procedure-related side effects (vaccination <18yrs) **Inclusion criteria:** Infants receiving pentavalent vaccination **Exclusion criteria:** Agitation before vaccination **ICD code:** Vaccination (neonatal)	**Name:** AT - lavender (inhalation) **What – essential oil & procedure:** lavender (0.5%, no carrier), 5 drops administered on a cotton ball attached to upper clothing **When & how much:** 1 x 1min before vaccination **Who administered (provider; AT training):** provider administered (research staff; AT training) **Co-intervention(s):** n/a	**Name:** inactive - placebo **What – materials & procedure:** sweet almond oil (undiluted, carrier n/a), 5 drops administered on a cotton ball attached to upper clothing **When & how much:** 1 x 1min before vaccination **Who administered (provider):** provider administered **No. arms included in synthesis (treatment & control):** 2 **Ineligible arms:** none	**Eligible outcomes:** Pain: periprocedural pain intensity (NIPS - overall* and 6 subcales; crying time) **Ineligible outcomes:** n/a **Timing of outcome measurement:** 15 sec*; 5 min post-injection
Veiskaramian 2021 [180-S] **Country:** Iran **Setting (detail):** hospital - emergency (Cardiology emergency department) **Study design:** parallel group	**No. randomised (age; sex):** 72 adults (AT. 57 years, C. 55 [mean]; AT. 45% female, C. 45%) **Treatment goal:** relieve treatment-related side effects (CVD inpatient stress) **Inclusion criteria:** Diagnosed with ACS; ED admission without cardiac arrest; DASS-21 score > 19; Chest pain (VAS $\geqslant$ 3) **Exclusion criteria:** History of head concussion & seizures; psychiatric and cognitive disorders; drugs or alcohol addiction; PTSD; use of anti-anxiety or sedative medications **ICD code:** BA4Z Acute ischaemic heart disease, unspecified	**Name:** AT - lemon balm (inhalation) **What – essential oil & procedure:** lemon balm (90% in primrose oil) administered on patches attached to oxygen mask **When & how much:** 2 drops, 2 x 10 minutes with a 90-minute interval **Who administered (provider; AT training):** provider administered (nurse clinically qualified; NR) **Co-intervention(s):** n/a	**Name:** inactive - placebo **What – materials & procedure:** scentless refined oil, administered on patches attached to oxygen mask **When & how much:** 2 drops, 2 x 10 minutes with a 90-minute interval **Who administered (provider):** provider administered **No. arms included in synthesis (treatment & control):** 2 **Ineligible arms:** none	**Eligible outcomes:** Emotional functioning/mental health: stress during hospitalisation (DASS-21 stress subscale*; threat perception scale) Pain: chest pain intensity (VAS)* **Ineligible outcomes:** Physiological function, signs and symptoms: MAP, HR **Timing of outcome measurement:** 5* and 15 mins after 1st and 2nd* AT intervention
Waldman 1993 [176-S] **Country:** United Kingdom **Setting (detail):** hospital - inpatient (Intensive care unit) **Study design:** parallel group	**No. randomised (age; sex):** 122 adults (age, sex NR) **Treatment goal:** relieve treatment-related side effects (ICU patient stress) **Inclusion criteria:** Patients in the intensive care unit (inferred, not explicitly reported) **Exclusion criteria:** NR **ICD code:**	**Name:** AT - lavender (massage) **What – essential oil & procedure:** lavender (1%, carrier NR) administered by massage (protocol NR) **When & how much:** 3 x sessions (massage length NR)	**Name:** C1 inactive control - massage (co-intervention) C2 inactive control - usual care **What – materials & procedure:** C1-Massage (protocol NR) C2-rest periods (protocol NR) **When & how much:** C1-3 x sessions (massage length NR) C2-3 x sessions (length NR)	**Eligible outcomes:** Emotional functioning/mental health: anxiety during hospitalisation (4-pt scale, study-specific measure)* **Ineligible outcomes:** Emotional functioning/mental health: coping ability, mood response; Physiological function, signs and symptoms: SBP, HR, RR

Study details	Population	Aromatherapy intervention arm(s)	Comparator arm(s)	Outcomes (* = selected for synthesis)
	Intensive care	**Who administered (provider; AT training):** provider administered (NR; NR) **Co-intervention(s):** n/a	**Who administered (provider):** C1-provider administered C2-n/a **No. arms included in synthesis (treatment & control):** 3 **Ineligible arms:** none	**Timing of outcome measurement:** after 1st, 2nd and 3rd* AT interventions
Watson 2019 [339-S] **Country:** Australia **Setting (detail):** aged care facility (Residential Aged Care Facility) **Study design:** crossover	**No. randomised (age; sex):** 70 adults (89 years (mean) ;75% female n.b. data reported for 49/70 analysed participants) **Treatment goal:** relieve symptoms of a condition (agitation) **Inclusion criteria:** Moderate or higher cognition (MMSE score >10) with or without dementia; Agitated behaviours (at least one ACFI behaviour domain); Agitation (nurse assessed on NPI $\geqslant$ 6 x in last 2 weeks) **Exclusion criteria:** Psychosis or agitation from brain damage; acute life threatening or confounding condition (e.g. Parkinsons) **ICD code:** 6D86.4 Agitation or Aggression in Dementia [includes participants without dementia]	**Name:** AT1 - lemon balm (inhalation) AT2 - lavender (inhalation) **What – essential oil & procedure:** AT1. lemon balm (50%) or AT2. lavender (100%) in jojoba oil, applied to cotton patch attached to collar **When & how much:** 3 x drops for 2 hours daily x 14 days **Who administered (provider; AT training):** provider administered (research staff; AT training) **Co-intervention(s):** n/a	**Name:** inactive - placebo **What – materials & procedure:** sunflower oil applied applied to cotton patch attached to collar **When & how much:** 3 drops, 2 hours daily x 14 days **Who administered (provider):** provider administered **No. arms included in synthesis (treatment & control):** 3 **Ineligible arms:** none	**Eligible outcomes:** Emotional functioning/mental health: agitation (CMAI - overall*; NPI - agitation/aggression subscale); BPSD (NPI - overall; subscales: delusions, aberrant motor activity, irritability/lability, night-time disturbances, anxiety, depression) **Ineligible outcomes:** n/a **Timing of outcome measurement:** week 2 (end of Tx period 1)*, week 4, week 6 (end of Tx period 2)*, week 8, week 10 (end of Tx period 3)*
Wiebe 2000 [338-S] **Country:** Canada **Setting (detail):** day surgery (Urban free-standing abortion clinic) **Study design:** parallel group	**No. randomised (age; sex):** 66 adults (AT. 27 years, C. 26 [mean]; 100% female) **Treatment goal:** prevent surgery-related side effects (induced abortion) **Inclusion criteria:** Scheduled for surgical abortion **Exclusion criteria:** n/a **ICD code:** JA00.1 Induced abortion (surgical)	**Name:** AT - essential oil blend (inhalation) **What – essential oil & procedure:** vetivert, bergamot, & geranium oils in 3:6:4 blend (dilution NR, in cold-pressed soya oil) inhaled from opaque bottle **When & how much:** a few drops inhaled for 10 minutes, 30 - 60 minutes prior to surgery **Who administered (provider; AT training):** provider administered (allied health practitioner; NR) **Co-intervention(s):** n/a	**Name:** inactive - placebo **What – materials & procedure:** hair conditioner containing Brazil nut oil (similar odour to AT treatment) inhaled from opaque bottle **When & how much:** 10 minutes, 30 - 60 minutes prior to surgery **Who administered (provider):** provider administered **No. arms included in synthesis (treatment & control):** 2 **Ineligible arms:** none	**Eligible outcomes:** Emotional functioning/mental health: preoperative anxiety (0 to 10 scale, unclear if NRS or VAS)* **Ineligible outcomes:** n/a **Timing of outcome measurement:** prior to surgery (and immediately after the AT intervention)*

Study details	Population	Aromatherapy intervention arm(s)	Comparator arm(s)	Outcomes (* = selected for synthesis)
Wilcock 2004 [337-S] **Country:** United Kingdom **Setting (detail):** palliative care (Palliative day care unit) **Study design:** parallel group	**No. randomised (age; sex):** 46 elderly (AT. 74 years, C. 71 [mean]; AT. 26% female, C. 26%) **Treatment goal:** relieve symptoms of a condition (any cancer) **Inclusion criteria:** Attending for visit 3 of cancer day care **Exclusion criteria:** Frailty **ICD code:** 02 Neoplasms	**Name:** AT - lavender & chamomile (massage) **What – essential oil & procedure:** lavender & chamomile (1% in sweet almond oil) administered by massage of back, neck, shoulders or hand, depending on participant's preference **When & how much:** 30-minute massage, once per week for 4 weeks **Who administered (provider; AT training):** provider administered (aromatherapist; NR) **Co-intervention(s):** n/a	**Name:** inactive - no intervention **What – materials & procedure:** n/a **When & how much:** n/a **Who administered (provider):** n/a **No. arms included in synthesis (treatment & control):** 2 **Ineligible arms:** none	**Eligible outcomes:** Emotional functioning/mental health: mental distress severity (POMS - total score)* HR-QoL: overall HR-QoL (NRS*, based on MYMOP approach, but MYMOP measure not administered) **Ineligible outcomes:** 'Other' symptoms: intensity and bother of two most important physical symptom (NRS, based on MYMOP approach, but MYMOP measure not administered) **Timing of outcome measurement:** weeks 1, 2, 3 and 4* (end of AT intervention period)
Wilkinson 1995.1 [179-S] **Country:** United Kingdom **Setting (detail):** palliative care (Palliative care centre) **Study design:** parallel group	**No. randomised (age; sex):** 51 adults (53 years [mean]; 94% female) **Treatment goal:** relieve symptoms of a condition (advanced cancer) **Inclusion criteria:** Advanced cancer (receiving palliative care); Referred for massage by a health professional **Exclusion criteria:** n/a **ICD code:** 02 Neoplasms (receiving palliative care)	**Name:** AT - chamomile (massage) **What – essential oil & procedure:** chamomile (1%, carrier: sweet almond oil) administered by full body massage according to a protocol **When & how much:** 3 massages (duration NR) over 3 weeks **Who administered (provider; AT training):** provider administered (nurse clinically qualified; AT trained (diploma)) **Co-intervention(s):** n/a	**Name:** inactive control - massage (co-intervention) **What – materials & procedure:** sweet almond oil administered by full body massage according to a protocol **When & how much:** 3 massages (duration NR) over 3 weeks **Who administered (provider):** provider administered **No. arms included in synthesis (treatment & control):** 2 **Ineligible arms:** none	**Eligible outcomes:** HR-QoL: overall HR-QoL (RSCL subdomains - psychological wellbeing*, physical wellbeing, activities of daily living; RSCL - global rating of QoL [single item]) Emotional functioning/mental health: mental distress - anxiety (STAI subdomains - state anxiety*, trait anxiety) **Ineligible outcomes:** n/a **Timing of outcome measurement:** weeks 1, 2 (STAI-S only) and 3* (end of AT intervention period, all measures)
Wilkinson 1999 [336-S] **Country:** United Kingdom **Setting (detail):** hospital - inpatient, hospital - outpatient (Palliative care centre)	**No. randomised (age; sex):** 103 participants (54 years [mean]; 90% female) **Treatment goal:** relieve symptoms of a condition (advanced cancer) **Inclusion criteria:** Palliative care patients **Exclusion criteria:** n/a	**Name:** AT - chamomile (massage) **What – essential oil & procedure:** chamomile (% NR, carrier: sweet almond oil) administered via body massage **When & how much:** 3 massages over 3 weeks (massage duration NR)	**Name:** inactive - massage (co-intervention) **What – materials & procedure:** sweet almond oil, full body massage **When & how much:** 3 massages over 3 weeks (massage duration NR) **Who administered (provider):** provider administered	**Eligible outcomes:** Emotional functioning/mental health: anxiety (STAI - state* and trait domains) HR-QoL: psychological wellbeing (RSCL - global QoL (single item), psychological* and physical wellbeing domains) **Ineligible outcomes:** n/a

Study details	Population	Aromatherapy intervention arm(s)	Comparator arm(s)	Outcomes (* = selected for synthesis)
Study design: parallel group	**ICD code:** 02 Neoplasms (receiving palliative care)	**Who administered (provider; AT training):** provider administered (nurse clinically qualified; AT trained (diploma)) **Co-intervention(s):** n/a	**No. arms included in synthesis (treatment & control):** 2 **Ineligible arms:** none	**Timing of outcome measurement:** STAI-S: immediately after massage 1, 2 and 3* (end of AT intervention period); STAI-T and RSCL: week 4* (1 week after end of AT intervention period)
Wilkinson 2007 [335-S] **Country:** United Kingdom **Setting (detail):** hospital - inpatient, palliative care (Cancer centers & hospice) **Study design:** parallel group	**No. randomised (age; sex):** 288 adults (AT. 52 years [mean], C. 53; AT. 86% female, C. 87%) **Treatment goal:** relieve symptoms of a condition (any cancer) **Inclusion criteria:** Clinical anxiety and/or depression: case or borderline (as per Structured Clinical Interview DSM-IV); **Exclusion criteria:** Clinical concern requiring a psychiatric assessment; use of psychotropic medication; formal psychological intervention in the past 3 months **ICD code:** 02 Neoplasms; MB24.3 Anxiety or SD82 Depression	**Name:** AT - various essential oils (massage) **What – essential oil & procedure:** selection from 20 essential oils (unspecified, diluted in 2 base oils, % and carrier NR) administered via massage according to pre-defined protocol **When & how much:** 1 x 1-hour massage weekly for 4 weeks **Who administered (provider; AT training):** provider administered (aromatherapist, massage therapist; AT training) **Co-intervention(s):** usual care as per comparator arm	**Name:** inactive - usual care **What – materials & procedure:** Usual supportive care. All participants had access to psychological support services as part of their cancer care. **When & how much:** n/a **Who administered (provider):** n/a **No. arms included in synthesis (treatment & control):** 2 **Ineligible arms:** none	**Eligible outcomes:** Emotional functioning/mental health: depression (diagnosis - SCID-II (for DSM-IV); CES-D), anxiety (clinical diagnosis; STAI), depression, anxiety or both* (diagnosis - SCID-II (for DSM-IV)) HR-QoL: overall HR-QoL (EORTC QLQ-C30 - global health status / QoL domain*) Fatigue: severity of fatigue (EORTC QLQ-C30 - fatigue domain*) Nausea and vomiting: severity of nausea, vomiting or both (EORTC QLQ-C30 - nausea and vomiting domain*) Pain: pain intensity (EORTC QLQ-C30 - pain domain*) **Ineligible outcomes:** n/a **Timing of outcome measurement:** weeks 6* (2 weeks after end of AT intervention period) and 10
Xiong 2018 [130-S] **Country:** China **Setting (detail):** community based (Community office) **Study design:** parallel group	**No. randomised (age; sex):** 60 adults (AT1. 67 years, AT2. 68, C. 68 [mean]; AT1. 45% female. AT2. 60%, C. 45%) **Treatment goal:** relieve symptoms of a condition (depression) **Inclusion criteria:** Symptoms of depression ($\geqslant$ 5 on Geriatric Depression Scale Short Form (GDS-SF), and $\geqslant$9 on PHQ-9); **Exclusion criteria:** schizophrenia, bipolar disorder, anxiety disorder, suicidal intention	**Name:** AT1 - essential oil blend (massage) AT2 - essential oil blend (inhalation) **What – essential oil & procedure:** AT1-lavender, sweet orange, bergamot in a 2:1:1 ratio (1% dilution in sweet almond oil) administered by traditional Chinese massage to palm, wrist, arm, shoulder, neck, and head AT2-lavender, sweet orange, & bergamot in a 2:1:1 ratio (1% in sweet almond oil, and then in 5:1	**Name:** inactive - no intervention **What – materials & procedure:** n/a **When & how much:** n/a **Who administered (provider):** n/a **No. arms included in synthesis (treatment & control):** 3 **Ineligible arms:** none	**Eligible outcomes:** Emotional functioning/mental health: depression symptom severity (Geriatric Depression Scale Short Form (GDS-SF)*, Patient Health Questionnaire-9 (PHQ-9)) **Ineligible outcomes:** Physiological function, signs and symptoms: 5-hydroxytryptamine **Timing of outcome measurement:** end of 8-week AT intervention period*, 6 and 10 weeks post AT intervention

Study details	Population	Aromatherapy intervention arm(s)	Comparator arm(s)	Outcomes (* = selected for synthesis)
	psychotherapy, antidepressant or other psychotropic drug usage within the past month **ICD code:** Older adults with depression symptoms	dilution in purified water) administered by nebuliser **When & how much:** AT1-30-min massage twice weekly for 8 weeks (total 16 massages) AT2-50 mL of oil in 10mL of purified water inhaled in 15 m2 room for 30 mins twice weekly for 8 weeks (16 sessions) **Who administered (provider; AT training):** provider administered (massage therapist; NR) **Co-intervention(s):** n/a		
Yadegari 2021 [051-S] **Country:** Iran **Setting (detail):** hospital - inpatient (General surgery ward) **Study design:** parallel group	**No. randomised (age; sex):** 84 adults (AT. 36 years, C. 36 [mean]; AT. 21% female, C. 21%) **Treatment goal:** prevent surgery-related side effects (laparotomy) **Inclusion criteria:** Scheduled for elective laparotomy **Exclusion criteria:** History of psychiatric disorders **ICD code:** Laparotomy	**Name:** AT - jasmine (inhalation) **What – essential oil & procedure:** jasmine (1:2, carrier: ethanol) administered directly to the collar area **When & how much:** 2 drops of oil for 60 mins on morning of surgery (7.30 am to 8.30 am) **Who administered (provider; AT training):** provider administered (NR; NR) **Co-intervention(s):** n/a	**Name:** inactive - placebo **What – materials & procedure:** distilled water administered directly to the collar area **When & how much:** 2 drops of distilled water for 60 mins on morning of surgery (7.30 am to 8.30 am) **Who administered (provider):** provider administered **No. arms included in synthesis (treatment & control):** 2 **Ineligible arms:** none	**Eligible outcomes:** Emotional functioning/mental health: preoperative anxiety (STAI - state)* **Ineligible outcomes:** Physiological function, signs and symptoms: blood cortisol **Timing of outcome measurement:** morning of surgery (immediate post AT intervention)*
Yang 2015 [355-S] **Country:** Taiwan **Setting (detail):** aged care facility (Veteran retirement homes & long-term care facilities) **Study design:** parallel group	**No. randomised (age; sex):** 114 adults (AT. 84 years, C. 82 [mean]; AT. 34% female, C. 25%) **Treatment goal:** relieve symptoms of a condition (agitation, dementia) **Inclusion criteria:** Dementia (DSM-IV diagnosis by psychiatrist or neurologist); Severe agitation (score $\geqslant$ 35 on Cohen-Mansfield Agitation Inventory (CMAI)); **Exclusion criteria:** n/a	**Name:** AT - lavender (topical) **What – essential oil & procedure:** lavender (2.5%, carrier NR) applied at 5 acupoints **When & how much:** oil (volume NR) applied for 10 minutes + 5-minute warm-up exercise, once daily for 5 days per week for 4 weeks (20 sessions) **Who administered (provider; AT training):** NR (NR; NR)	**Name:** inactive - usual care **What – materials & procedure:** daily care routine (not described) **When & how much:** n/a **Who administered (provider):** n/a **No. arms included in synthesis (treatment & control):** 2 **Ineligible arms:** aroma-acupressure	**Eligible outcomes:** Emotional functioning/mental health: agitation (CMAI - overall)* **Ineligible outcomes:** Physiological function, signs and symptoms: heart rate variability **Timing of outcome measurement:** week 4 (end of AT intervention period)*, week 7

Study details	Population	Aromatherapy intervention arm(s)	Comparator arm(s)	Outcomes (* = selected for synthesis)
	ICD code: 6D8Z Dementia, Unknown or Unspecified Cause	**Co-intervention(s):** n/a		
Yang 2016 [107-S] **Country:** Taiwan **Setting (detail):** aged care facility (Long-term care facilities) **Study design:** parallel group	**No. randomised (age; sex):** 59 elderly (AT. 83 years, C. 81 [mean]; AT. 66%, C. 57%) **Treatment goal:** relieve symptoms of a condition (agitation & depression, dementia) **Inclusion criteria:** Residents of long-term care facilities; Mild-severe dementia (SPMSQ $\leqslant$ 8 or MMSE $\leqslant$ 17 or 23); Exhibited agitation or depressive symptoms within last 2 weeks (based on CMAI-C or CSDD-C); **Exclusion criteria:** Severe behavioural problems limiting interaction with researcher **ICD code:** 6D8Z Dementia, Unknown or Unspecified Cause	**Name:** AT - lavender & orange (massage) **What – essential oil & procedure:** lavender and orange (100%, 3 drops each mixed with 5 mL oil), administered via neck, shoulder and arm massage according to a protocol **When & how much:** 30-min massage once per week for 8 weeks **Who administered (provider; AT training):** provider administered (research staff; AT training) **Co-intervention(s):** n/a	**Name:** inactive - no intervention **What – materials & procedure:** n/a **When & how much:** n/a **Who administered (provider):** n/a **No. arms included in synthesis (treatment & control):** 2 **Ineligible arms:** none	**Eligible outcomes:** Emotional functioning/mental health: agitation (CCMAI overall score*; CCMAI clinician rating of agitation in last 24hrs as decreased, constant, increased); depression-related symptoms of dementia (CSDD-C overall score and subscales: mood-related signs, behaviour disturbance, physical signs, ideational disturbances, cyclic functions) **Ineligible outcomes:** n/a **Timing of outcome measurement:** week 2 (24-hr rating of agitation only), week 5, week 9 (end of AT intervention period)*
Yayla 2019 [129-S] **Country:** Turkey **Setting (detail):** hospital - outpatient (Chemotherapy unit) **Study design:** parallel group	**No. randomised (age; sex):** 123 adults (54 years [mean]; 68% female) **Treatment goal:** relieve procedure-related side effects (central venous port insertion) **Inclusion criteria:** Cancer patients with implantable venous port catheters undergoing chemotherapy **Exclusion criteria:** Use of painkillers in previous 3 hrs; VAS scores > 1 at baseline **ICD code:** Needle insertion (implantable central venous port)	**Name:** AT1 - eucalyptus (inhalation) AT2 - lavender (inhalation) **What – essential oil & procedure:** AT1. eucalyptus or AT2. lavender (% and carrier NR) administered on cotton swab and inhaled at distance of 10 cm **When & how much:** 3 drops of oil, once for 3 mins before procedure **Who administered (provider; AT training):** provider administered (NR; NR) **Co-intervention(s):** n/a	**Name:** inactive - no intervention **What – materials & procedure:** n/a **When & how much:** n/a **Who administered (provider):** n/a **No. arms included in synthesis (treatment & control):** 3 **Ineligible arms:** none	**Eligible outcomes:** Pain: periprocedural pain intensity (VAS)* Emotional functioning/mental health: postprocedural anxiety - immediate (STAI-I)* **Ineligible outcomes:** n/a **Timing of outcome measurement:** immediate post-procedure*
Yazdkhasti 2016 [128-S] **Country:** Iran	**No. randomised (age; sex):** 120 adults (AT. 18 years, C. 19 [mean]; 100% female) **Treatment goal:** relieve symptoms of a condition (labour, stages 1-3)	**Name:** AT - lavender (inhalation) **What – essential oil & procedure:** lavender (10%, carrier: distilled water) administered on the patients	**Name:** inactive - placebo **What – materials & procedure:** distilled water administered on the patient's palm, rubbed together and held 2.5-5 cm from their nose	**Eligible outcomes:** Pain: pain intensity (VAS)* **Ineligible outcomes:** 'Other' pregnancy, puerperium and perinatal outcomes:

Study details	Population	Aromatherapy intervention arm(s)	Comparator arm(s)	Outcomes (* = selected for synthesis)
Setting (detail): hospital - inpatient (NR) **Study design:** parallel group	**Inclusion criteria:** Primiparous women, cervical dilation >3-4 cm **Exclusion criteria:** Receiving analgesia during labor; emergency Caesarean section **ICD code:** Labour, stages 1-3	palm, rubbed together and held 2.5-5 cm from their nose **When & how much:** 3 x 3 mins, at dilations 5-6 cm, 7-8 cm and 9-10 cm) (amount NR) **Who administered (provider; AT training):** provider administered (nurse clinically qualified; NR) **Co-intervention(s):** n/a	**When & how much:** 3 x 3 mins, at dilations 5-6 cm, 7-8 cm and 9-10 cm) (amount NR) **Who administered (provider):** provider administered **No. arms included in synthesis (treatment & control):** 2 **Ineligible arms:** none	duration of labour (active, second stage); 1- and 5-min Apgar scores **Timing of outcome measurement:** dilation 5-6 cm (30 mins after 1st AT intervention); dilation 7-8 cm (30 mins after 2nd AT intervention); dilation 9-10 cm (30 mins after final AT intervention)*
Yıldırım 2020 [126-S] **Country:** Turkey **Setting (detail):** palliative care (Palliative care unit) **Study design:** parallel group	**No. randomised (age; sex):** 75 adults (AT. 65 years, C. 70 [mean]; AT. 12% female, C. 24%) **Treatment goal:** relieve symptoms of a condition (any cancer) **Inclusion criteria:** Receiving palliative care (at least 2 days) **Exclusion criteria:** **ICD code:** Receiving palliative care	**Name:** AT - lavender (inhalation) **What – essential oil & procedure:** lavender (undiluted, carrier n/a) administered in glass bowl on nightstand **When & how much:** 3 mL of oil inhaled in 10 deep breaths at bedtime (10:00 pm), then overnight (10:00 pm - 6:00 am) for 2 consecutive nights **Who administered (provider; AT training):** provider administered (nurse clinically qualified; AT training) **Co-intervention(s):** n/a	**Name:** inactive - no intervention **What – materials & procedure:** n/a **When & how much:** n/a **Who administered (provider):** n/a **No. arms included in synthesis (treatment & control):** 2 **Ineligible arms:** none	**Eligible outcomes:** Sleep: sleep quality overall (RCSQ - overall score*, deep/nap sleep, ease of falling asleep, awakenings, ease of return to sleep, quality of sleep subdomains) **Ineligible outcomes:** Physiological function, signs and symptoms: SBP, DBP, HR, RR, SpO2 **Timing of outcome measurement:** morning after 1st and 2nd* AT intervention
Ying 2019 [053-S] **Country:** China **Setting (detail):** hospital - outpatient (Outpatients at traditional Chinese medicine hospital) **Study design:** parallel group	**No. randomised (age; sex):** 70 males (AT. 31 years, C. 32 [mean]) **Treatment goal:** relieve symptoms of a condition (chronic prostatitis) **Inclusion criteria:** Chronic prostatitis/Chronic pelvic pain syndrome (type III) **Exclusion criteria:** Cancer, procedures or infections in pelvic region in last 6 months **ICD code:** GA91.0 Chronic prostatitis; MG30.00 Chronic primary pelvic pain syndrome	**Name:** AT - essential oil blend (massage) **What – essential oil & procedure:** essential oil blend (sandalwood, jasmine, ginger, cinnamon, rosemary, clary sage, and other ingredients, carrier: almond oil) administered by self-massage as per protocol **When & how much:** 1 x 5-minute massage daily with 2mL of oil over 4 weeks	**Name:** inactive control - massage (co-intervention) **What – materials & procedure:** Almond oil (undiluted) administered by self-massage as per protocol **When & how much:** 1 x 5-min massage daily with 2mL of oil over 4 weeks **Who administered (provider):** self-administered, provider prescribed **No. arms included in synthesis (treatment & control):** 2	**Eligible outcomes:** Pain: chronic prostatitis pain intensity (NIH-CPSI pain or discomfort overall domain score*, pain or discomfort 6 sub-domain scores) HR-QoL: overall QoL (NIH-CPSI QoL domain)* **Ineligible outcomes:** Physiological function, signs and symptoms: WBC, lecithin body, urination. **Timing of outcome measurement:** week 2 and 4* (end of AT intervention period)

Study details	Population	Aromatherapy intervention arm(s)	Comparator arm(s)	Outcomes (* = selected for synthesis)
		Who administered (provider; AT training): self-administered, provider prescribed (medical practitioner; NR) **Co-intervention(s):** n/a	**Ineligible arms:** none	
Yip 2008 [127-S] **Country:** China **Setting (detail):** community based (Community Centre for Senior Citizens) **Study design:** parallel group	**No. randomised (age; sex):** 59 adults (74 years [mean]; 79% female) **Treatment goal:** treat underlying condition (e.g. curative) (knee pain) **Inclusion criteria:** Knee pain (> 4 on 10-point VAS) **Exclusion criteria:** Current steroid injection treatment; knee joint surgery in past 3 months; receiving physiotherapy for knee joint pain; wound or acute inflammatory signs over knee joint area; cancer or blood clotting diseases (e.g. hemophilia) **ICD code:** ME82 Pain in joint (knee)	**Name:** AT - ginger (massage) **What – essential oil & procedure:** ginger (1%, carrier: 0.5% orange oil in olive oil) administered by knee massage according to a protocol **When & how much:** 6 x ~30-minute massage on both lower limbs over 2-3 weeks **Who administered (provider; AT training):** provider administered (nurse clinically qualified; NR) **Co-intervention(s):** usual care as per comparator arm	**Name:** C1 inactive control - massage (co-intervention) C2 inactive - usual care **What – materials & procedure:** C1-olive oil administered by knee massage according to a protocol C2-usual care not described **When & how much:** C1-6 x ~30-minute massage on both lower limbs over 2-3 weeks C2-n/a **Who administered (provider):** C1-provider administered C2-NR **No. arms included in synthesis (treatment & control):** 3 **Ineligible arms:** none	**Eligible outcomes:** Pain: knee pain intensity (WOMAC pain subscale)*; bodily pain (SF-36 subscale); pain intensity (VAS - result not reported) Physical function: physical function (WOMAC physical functioning subscale*; SF-36 physical functioning and physical role limitations subscales) Fatigue: overall fatigue (SF36 vitality [energy/fatigue] subscale)* HR-QoL: overall HR-QoL (SF36 general health subscale)* **Ineligible outcomes:** Emotional functioning/mental health: mental health (SF-36 emotional well-being and role limitations due to emotional problems subscales); HR-QoL (SF-36 social function); 'Other' symptoms: stiffness (WOMAC subscale); **Timing of outcome measurement:** ~ weeks 3* and 7** (1 week and 4 weeks after end of AT intervention period; ** for HRQoL)
Yoshiyama 2015.1 [125-S] **Country:** Japan **Setting (detail):** aged care facility (Nursing home) **Study design:** crossover	**No. randomised (age; sex):** 14 elderly (83 years [mean]; 100% female) **Treatment goal:** relieve symptoms of a condition (depression, dementia) **Inclusion criteria:** Dementia (mild to moderate; score of 10 - 26 on MMSE); Independence Degree of Daily Living for the Demented Elderly scale score of III **Exclusion criteria:** Any acute physical illness **ICD code:**	**Name:** AT - essential oil blend (massage) **What – essential oil & procedure:** essential oil blend (2 - 3% dilution in vegetable oil) administered by hand massage **When & how much:** 3 mL oil massaged for 10 minutes, 3 x week for 4 weeks (12 sessions)	**Name:** inactive control - massage (co-intervention) **What – materials & procedure:** jojoba oil (undiluted, carrier n/a) administered by hand massage **When & how much:** 3 mL oil massaged for 10 minutes, 3 x week for 4 weeks (12 sessions) **Who administered (provider):** provider administered	**Eligible outcomes:** Emotional functioning/mental health: behavioural and psychological symptoms of dementia (NPI-Q overall; CMAI subscales); depression (CSDD overall*; subscales: mood-related signs, behavioural disturbance, physical signs, cyclic functions, ideational disturbance) **Ineligible outcomes:** Activities of daily living: ADL in dementia (FIM overall)

Study details	Population	Aromatherapy intervention arm(s)	Comparator arm(s)	Outcomes (* = selected for synthesis)
	6D8Z Dementia, Unknown or Unspecified Cause (mixed)	**Who administered (provider; AT training):** provider administered (aromatherapist; NR) **Co-intervention(s):** n/a	**No. arms included in synthesis (treatment & control):** 2 **Ineligible arms:** none	**Timing of outcome measurement:** week 4 (end of AT intervention period)*, week 8 (second follow-up)
Yu 2017 [351-S] **Country:** Korea **Setting (detail):** hospital - inpatient (NR) **Study design:** parallel group	**No. randomised (age; sex):** 44 adults (AT. 61 years, C. 61 [mean]; AT. 32% female, C. 36%) **Treatment goal:** relieve procedure-related side effects (catheter removal) **Inclusion criteria:** Patients with colorectal cancer who had indwelling urinary catheters removed post-surgery; Received fentanyl and ketorolac tromethamine post-surgery **Exclusion criteria:** Postoperative complications **ICD code:** 2B91.Z Malignant neoplasms of rectosigmoid junction (catheter removal following CRC surgery)	**Name:** AT - lavender (inhalation) **What – essential oil & procedure:** lavender (1%, carrier: almond oil) administered on 4 × 2 cm gauze suspended above the upper lip **When & how much:** 1 mL of oil, once for 20 mins following the removal of the indwelling urinary catheter (implanted after CRC surgery) **Who administered (provider; AT training):** provider administered (NR; NR) **Co-intervention(s):** n/a	**Name:** inactive - placebo **What – materials & procedure:** almond oil administered on 4 × 2 cm gauze suspended above the upper lip **When & how much:** 1 mL of oil, once for 20 mins following the removal of the indwelling urinary catheter (implanted after CRC surgery) **Who administered (provider):** provider administered **No. arms included in synthesis (treatment & control):** 3 **Ineligible arms:** linalyl acetate (active ingredient in lavender EO; 1% LA in almond oil, inhaled))	**Eligible outcomes:** Pain: postprocedural pain intensity - early acute (VAS)* **Ineligible outcomes:** HR-QoL: single item measure of happiness; Physiological function, signs and symptoms: BP, HR; lower urinary tract function (total symptom score) **Timing of outcome measurement:** ~30 mins after catheter removal (and immediately after AT intervention)*
Zardosht 2021 [086-S] **Country:** Iran **Setting (detail):** hospital - inpatient (Women's surgery department) **Study design:** parallel group	**No. randomised (age; sex):** 128 participants (AT1. 26 years, C. 25 years; 100% female) **Treatment goal:** relieve surgery-related side effects (caesarean section) **Inclusion criteria:** Primiparous women, scheduled for elective caesarean; Pain > 4 on 10-point VAS **Exclusion criteria:** Women requiring emergency caesarean section **ICD code:** JB22.0 Delivery by elective caesarean section	**Name:** AT - chamomile (inhalation) **What – essential oil & procedure:** chamomile (5% dilution, no carrier) poured into cup and inhaled at distance of 5 cm **When & how much:** 1 drop of oil inhaled for 15-20 mins at 4, 8 and 12 hrs after surgery **Who administered (provider; AT training):** provider administered (research staff; NR) **Co-intervention(s):** n/a	**Name:** inactive - placebo **What – materials & procedure:** placebo, materials NR, but 'similar to chamomile oil in terms of colour, smell, and concentration' **When & how much:** NR, likely as per AT intervention group **Who administered (provider):** provider administered **No. arms included in synthesis (treatment & control):** 2 **Ineligible arms:** none	**Eligible outcomes:** Pain: postoperative pain intensity - acute [12 hrs] (VAS)* **Ineligible outcomes:** n/a **Timing of outcome measurement:** 4, 8 and 12* hrs post-surgery
Zayeri 2019 [046-S] **Country:** Iran	**No. randomised (age; sex):** 96 adults (AT. 20 years; C. 20 years [mean]; 100% female)	**Name:** AT - lavender (inhalation) **What – essential oil & procedure:** lavender (2:1 in sesame oil), 3 drops	**Name:** inactive - placebo **What – materials & procedure:** sesame oil (undiluted, carrier n/a), 3 drops	**Eligible outcomes:** Pain: pain intensity (menstrual cramps, VAS)*, abdominal and back pain intensity (study-specific questionnaire)

Study details	Population	Aromatherapy intervention arm(s)	Comparator arm(s)	Outcomes (* = selected for synthesis)
Setting (detail): community based (Dormitory) **Study design:** parallel group	**Treatment goal:** relieve symptoms of a condition (dysmenorrhoea) **Inclusion criteria:** Primary dysmenorrhoea (Andersch & Milson's level 2-3) **Exclusion criteria:** Use of analgesics for dysmenorrhea; other pelvic disease or pathologies **ICD code:** GA34.3 Dysmenorrhoea	administered on the palms, inhaled 7-10cm from nose **When & how much:** 5 min every 6 hrs for the first 3 days of menstruation, for 2 menstrual cycles **Who administered (provider; AT training):** self-administered, provider prescribed (NR; NR) **Co-intervention(s):** n/a	administered on the palms, inhaled 7-10cm from nose **When & how much:** 5 min every 6 hrs for the first 3 days of menstruation, for 2 menstrual cycles **Who administered (provider):** self-administered, provider prescribed **No. arms included in synthesis (treatment & control):** 2 **Ineligible arms:** none	**Ineligible outcomes:** Overall menstrual symptoms: 10 dysmenorrhoea symptoms excluding abdominal pain & backache (study-specific questionnaire); amount of menstrual bleeding (pictorial blood assessment chart); presence of clots in menstrual blood (Y/N) **Timing of outcome measurement:** 1, 2, 4 and 48* hrs in cycles 1 and 2*
Ziyaeifard 2017.1 [047-S] **Country:** Iran **Setting (detail):** hospital - inpatient (Heart referral hospital) **Study design:** parallel group	**No. randomised (age; sex):** 80 adults (AT. 50 years, C. 51 [mean]; AT. 65% female; C. 45%) **Treatment goal:** relieve procedure-related side effects (coronary angiography) **Inclusion criteria:** Scheduled for first-time coronary angiography **Exclusion criteria:** History of taking psychiatric drugs **ICD code:** Coronary angiography	**Name:** AT - lavender (inhalation) **What – essential oil & procedure:** lavender (undiluted, carrier n/a) administered on a piece of cotton wool placed 5cm from the nose **When & how much:** 2 x 5 mins inhalation of 5 drops; 30 mins before and 60 mins after procedure **Who administered (provider; AT training):** provider administered (research staff; NR) **Co-intervention(s):** n/a	**Name:** inactive - placebo **What – materials & procedure:** distilled water administered on a piece of cotton wool placed 5cm from the nose **When & how much:** 2 x 5 mins inhalation of 5 drops; 30 mins before and 60 mins after procedure. **Who administered (provider):** provider administered **No. arms included in synthesis (treatment & control):** 2 **Ineligible arms:** none	**Eligible outcomes:** Pain: postprocedural pain intensity - early acute (VAS)* Emotional functioning/mental health: preprocedural anxiety (STAI - trait and state* subscales) **Ineligible outcomes:** Physiological function, signs and symptoms: SBP, DBP, HR **Timing of outcome measurement:** Emotional functioning/mental health (anxiety): 30 min after AT intervention (before procedure)* Pain: post-intervention* (60 and 90 min after procedure; end of AT intervention) [only one set of data is reported for pain and it is unclear if this is the 60-min, 90-min postprocedure timepoints or the average of both]
Zorba 2018 [124-S] **Country:** Turkey **Setting (detail):** hospital - outpatient (Oncology polyclinic of a university hospital)	**No. randomised (age; sex):** 84 adults (AT1. 52%, AT2. 36%, C. 48%m[⩾ 46 years]; % female NR) **Treatment goal:** relieve treatment-related side effects (chemotherapy) **Inclusion criteria:** Breast cancer (stages I, II or IIIa); Received at least 1 cycle of	**Name:** AT1 - essential oil blend (inhalation) AT2 - essential oil blend (massage) **What – essential oil & procedure:** AT1-peppermint, bergamot & cardamon oils in 2:1:1 ratio (dilution NR; carrier: sweet almond oil) administered on a cotton	**Name:** inactive - usual care **What – materials & procedure:** routine treatment and care procedures not described **When & how much:** n/a **Who administered (provider):** n/a	**Eligible outcomes:** Nausea & vomiting: any nausea/vomiting within 24 hours of chemotherapy treatment (proportion with at least one episode; unclear from paper if nausea or vomiting)*; nausea severity within 24 hours of chemotherapy treatment (VAS); any retching within 24 hours of chemotherapy

Study details	Population	Aromatherapy intervention arm(s)	Comparator arm(s)	Outcomes (* = selected for synthesis)
Study design: parallel group	chemotherapy (AC/CAF protocol) and scheduled to receive 3 more **Exclusion criteria:** Metastasis; prior neoadjuvant chemotherapy **ICD code:** 2C6Z Malignant neoplasms of breast, unspecified (breast biopsy)	sponge placed on the tip of the nose AT2-peppermint, bergamot & cardamon oils in 2:1:1 ratio (dilution NR; carrier: sweet almond oil) administered by foot massage **When & how much:** AT1-2 mL essential oil mixture inhaled for 3 minutes, 5 minutes prior to chemotherapy treatment, once every 21 days before each of the 3 chemotherapy cycles AT2-2 mL of essential oil mixture massaged for 20 minutes (10 minutes per foot) in the treatment room before the start of chemotherapy, once every 21 days before each of the 3 chemotherapy cycles **Who administered (provider; AT training):** provider administered (research staff; NR) **Co-intervention(s):** n/a	**No. arms included in synthesis (treatment & control):** 3 **Ineligible arms:** none	treatment (patient self-report of whether retching present) **Ineligible outcomes:** n/a **Timing of outcome measurement:** 18-hour period starting ~ 2.5 hrs after AT treatment and immediately after end of each chemotherapy treatment (cycle 2, 3, and 4*)