Effectiveness of complementary and self-help treatments for depression in children and adolescents

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ABSTRACT

Objective: To review the evidence for the effectiveness of complementary and self-help treatments for depression in children and adolescents.

Data sources: Systematic literature search using PubMed, PsycINFO and the Cochrane Library for 131 treatments up to February 2006.

Study selection: There were 13 treatments that had been evaluated in intervention studies.

Data extraction: Studies on each treatment were reviewed by one author and checked by a second. A consensus was reached for level of evidence.

Data synthesis: Relevant evidence was available for glutamine, *S*-adenosylmethionine, St John's wort, vitamin C, omega-3 fatty acids, light therapy, massage, art therapy, bibliotherapy, distraction techniques, exercise, relaxation therapy and sleep deprivation. However, the evidence was limited and generally of poor quality. The only treatment with reasonable supporting evidence was light therapy for winter depression.

Conclusions: Given that antidepressant medication is not recommended as a first line treatment for children and adolescents with mild to moderate depression, and that the effects of psychological treatments are modest, there is a pressing need to extend the range of treatments available for this age group.

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Depressive disorders are estimated to affect 3% of Australians aged 6–17 years every year.[1] Many of these young people remain untreated and, for those who receive professional help, the range of evidence-based interventions is limited. Although antidepressants are effective in treating adults with depression, it is not clear whether they are safe and effective for children and adolescents. Recent meta-analyses have cast doubt on the clinical significance of antidepressant efficacy and raised concerns about increased suicidal behaviours.[2-6] The Australian Therapeutic Goods Administration has instituted new warnings about suicidal behaviour on antidepressant packaging,[7] and the Australian colleges of psychiatry, general practice and physicians have published advice on prescribing antidepressants for children and adolescents in light of this.[8]

In Australia, antidepressants are not registered for the treatment of depression in people younger than 18 years. Although the combination of fluoxetine and cognitive behaviour therapy (CBT) is the most effective treatment for moderate to severe major depression in adolescents,[9] the most recent Australian clinical practice guideline says that:

> Medication is generally not recommended as first line treatment for children and adolescents with mild to moderate depression. In this less severely ill population, CBT or other appropriate psychological management is the treatment of choice.[10]

However, the effects of CBT and other psychotherapies are much weaker in this age group than in adults.[11] For this reason, it is important to extend the range of possible treatments. A number of complementary and alternative medicine (CAM) and self-help treatments for depression have some supporting evidence in adults, including St John's wort, exercise, self-help books involving CBT, and light therapy (for winter depression).[12] However, this evidence cannot necessarily be generalised to younger ages.

Another reason for examining these treatments is that they are commonly used with children and adolescents. For example, a United States survey of children and adolescents attending an outpatient psychiatry clinic showed that 11% were using herbal medicines, and another study found that 20% of children with depression or attention deficit hyperactivity disorder were using them.[13,14] This use has implications for compliance with conventional treatments, as well as for potential drug interactions and adverse events.

The purpose of this review is to summarise the evidence on CAM and self-help treatments in children and adolescents with a depressive disorder or a high level of depressive symptoms. The review does not cover bipolar disorder. We define CAM treatments as those that involve practices and beliefs that are not generally upheld by the dominant health system in Western countries, while self-help treatments are those that can be used without necessarily consulting a health care professional.[12]

Methods

A literature search was performed for CAM and self-help treatments previously identified as helpful for depression or anxiety in adults.[12,15] Searches were also performed for additional treatments for depression in children and adolescents, which were determined by a search of the first 20 CAM websites retrieved by Google, and their recommended links. PubMed, PsycINFO and the Cochrane Library were searched using the following terms: name of treatment AND (depressi* OR mood OR affective OR dysthym*) AND (adolescen* OR children OR youth OR young OR teenager OR juvenile OR pediatric). The list of treatment terms used in the searches is available upon request. The literature searches were performed up to 6 February 2006 for all treatments except omega-3 fatty acids, which were searched up to 8 August 2006.

Studies were included if participants were identified as children or adolescents, or if the mean age of participants was 19 years or younger. Studies were excluded if participants did not have a depressive disorder or a high level of depressive symptoms. Studies were also excluded if the data reported were only correlational rather than evaluating a therapeutic intervention.

The literature on each treatment was independently evaluated by a pair of reviewers according to the Oxford Centre for Evidence-based Medicine Levels of Evidence (Box 1), who then reached a consensus. Note that the level of evidence refers to the certainty with which conclusions can be drawn, not whether the evidence is supportive of a particular treatment. As such, an intervention that

has been shown in a well designed study to be ineffective would be described as having a high level of evidence.

Results

A large number of treatments either had no evidence or had evidence that failed to meet the inclusion criteria (Box 2). Only Level 4 or 5 evidence was available for some treatments, listed in Box 3. Treatments with evidence at Level 3 or higher are reviewed below.

Non-prescription medicines

Omega-3 fatty acids

Description: These are long-chain polyunsaturated fatty acids found in various types of food, particularly fish. The ones derived from fish are primarily eicosapentaenoic acid (EPA) and docosahexaenoic acid (DHA).

Rationale: Omega-3 fatty acids play an important role in neuronal cell membranes. There is evidence linking lack of dietary omega-3 polyunsaturated fatty acids with depression in adults, and treatment trials have shown some promise.

Level of evidence: 2b.

Review of effectiveness: Only one trial has been performed in 28 children aged between 6 and 12 years. Children were randomly assigned to omega-3 fatty acids (1000 mg per day, containing both EPA and DHA) or placebo as pharmacological monotherapy.[29] Twenty children with at least 1 month of data were included in the analysis. Among the children on omega-3 treatment, seven out of 10 had a greater than 50% reduction in Children's Depression Rating Scale scores, compared with zero in the placebo group. No side effects were reported.

Conclusion: **Omega-3 fatty acids may have therapeutic benefits in childhood depression, but the one trial requires replication.**

1 Levels of evidence according to the Oxford Centre for Evidence-Based Medicine

Level	Description
1a	Systematic review (with homogeneity) of randomised controlled trials (RCTs)
1b	Individual RCT (with narrow confidence interval)
1c	All or none*
2a	Systematic review (with homogeneity) of cohort studies
2b	Individual cohort study (including low quality RCT)
2c	"Outcomes" research; ecological studies
3a	Systematic review (with homogeneity) of case–control studies
3b	Individual case–control studies
4	Case series (and poor quality cohort and case–control studies)
5	Expert opinion without explicit critical appraisal, or based on physiology, bench research or "first principles"

* All patients died before the treatment became available, but some now survive with the treatment; or some patients died before the treatment became available, but none now die with the treatment. ◆

Physical treatments

Light therapy

Description: Patients are exposed to a light box each day, which simulates the effect of sunlight. Most often, the light exposure is given in the morning. At latitudes where there is winter sun, exposure to natural sunlight would have the same effect.

***Rationale*:** Exposure to bright light is used as a treatment for seasonal depression, which starts in autumn or winter and remits in the spring or summer. However, this treatment has also been tried for non-seasonal depression. The reduced availability of

2 Treatments that did not have relevant evidence

Medicines and homeopathic remedies

5-Hydroxy-L-trytophan; American ginseng (*Panax quinquefolius*); ashwagandha (*Withania somnifera*); astragalus (*Astragalus membranaceous*); Bach flower remedies (including Rescue Remedy); basil (*Ocimum* spp.); Berocca; biotin; black cohosh (*Actaea racemosa* and *Cimicifuga racemosa*); borage (*Borago officinalis*); brahmi (*Bacopa monniera*); California poppy (*Eschscholtzia californica*); catnip (*Nepeta cataria*); cat's claw (*Uncaria tomentosa*); chamomile (*Anthemis nobilis*); chaste tree berry (*Vitex agnus castus*); Chinese medicinal mushrooms (reishi or Lingzhi) (*Ganoderma lucidum*); choline; chromium; clove (*Eugenia caryophyllata*); coenzyme Q10; combined preparations (EMPowerplus [Truehope Nutritional Support Ltd], euphytose, Mindsoothe Jr [Native Remedies], Sedariston, Worry Free); cowslip (*Primula veris*); damiana (*Turnera diffusa*); dandelion (*Taraxacum officinale*); flax seeds (linseed) (*Linum usitatissimum*); Fo-ti-tieng (Chinese herbal tonic); folate; γ-aminobutyric acid (GABA); ginger (*Zingiber officinale*); ginkgo biloba; ginseng (*Panax ginseng*); gotu kola (*Centella asiatica*); hawthorn (*Crataegus laevigata*); homeopathy; hops (*Humulus lupulus*); hyssop (*Hyssopus officinalis*); inositol; kampo (Japanese herbal therapy); kava (*Piper methysticum*); lecithin; lemon balm (*Melissa officinalis*); lemongrass leaves (*Cymbopogon citrates*); licorice (*Glycyrrhiza glabra*); melatonin; milk thistle (*Silybum marianum*); mistletoe (*Viscum album*); motherwort (*Leonurus cardiaca*); nettles (*Urtica dioica*); nicotinamide; oats (*Avena sativa*); painkillers/over-the-counter medicines; para-aminobenzoic acid (PABA); passionflower (*Passiflora incarnata*); peppermint (*Mentha piperita*); phenylalanine; purslane (*Portulaca oleracea*); rehmannia (*Rehmannia glutinosa*); rosemary (*Rosmarinus officinalis*); sage (*Salvia officinalis*); schizandra (*Schizandra chinensis*); selenium; Siberian ginseng (*Eleutherococcus senticosus*); skullcap (*Scutellaria lateriflora*); spirulina (*Arthrospira platensis*); St Ignatius bean (*Ignatia amara*); suanzaorentang; taurine; tension tamer; thyme (*Thymus vulgaris*); tissue salts; tyrosine; valerian (*Valeriana officinalis*); vervain (*Verbena officinalis*); vitamins B, D and E; wild yam (*Dioscorea villosa*); wood betony (*Stachys officinalis*, *Betonica officinalis*); yeast; zinc; zizyphus (*Zizyphus spinosa*).

Physical treatments

Acupuncture; air ionisation; aromatherapy; hydrotherapy; reflexology.

Psychological and lifestyle treatments

Adequate sleep; Alexander technique; autogenic training; colour therapy; humour; LeShan distance healing; meditation; music therapy; pets; pleasant activities; prayer; tai chi; yoga.

Dietary and other changes

Alcohol avoidance; alcohol for relaxation; avoiding certain foods (barley, rye, wheat, dairy foods); caffeine avoidance; carbohydrate-rich protein-poor diet; chocolate; ketogenic diet; marijuana avoidance; nicotine avoidance; sugar avoidance. ◆

3 Summary of treatments with Level 4 or 5 evidence only

Treatment	References	Level of evidence
Non-prescription medicines		
Glutamine	16, 17	4
S-Adenosylmethionine (SAMe)	18	4
St John's wort (*Hypericum perforatum*)	19-21	4
Vitamin C	22	5
Psychological or lifestyle treatments		
Exercise	23-25	4
Sleep deprivation	26-28	4

sunlight in winter is hypothesised to cause a phase delay in the circadian rhythm, which can lead to depression in some people. Exposure to light in the morning produces a phase advance and reduces the depression.

Level of evidence: For winter depression 1b; for non-seasonal depression 2b.

Review of effectiveness: There have been two randomised controlled trials of light therapy. The first involved five patients with winter depression and four with non-seasonal depression. The trial compared light therapy (2 hours in the evening) with relaxation training in a single-blind crossover design. Light therapy produced significant improvement in the winter depression group, but not in the non-seasonal group.[30] The second trial involved 28 patients with winter depression and compared light therapy (2 hours in the early morning plus 1 hour in the evening) with a placebo (1 hour wearing goggles plus 5 min low-intensity stimulation in the morning) in a double-blind crossover design. Parent-reported symptoms were significantly improved, but child-reported symptoms only showed a non-significant trend.[31]

Conclusion: **From the limited evidence, light therapy appears to be effective for winter depression. Although there is no evidence that it works for non-seasonal depression, the number of non-seasonal depression patients tested is very small.**

Massage

Description: Massage involves the external manipulation of soft tissue for therapeutic purposes.

Rationale: Massage is a traditional therapy, but there is research showing that it can decrease the stress hormone cortisol and increase the neurotransmitters serotonin and dopamine, which are thought to be affected in depression.[32]

Level of evidence: 2b.

Review of effectiveness: There have been three randomised controlled trials of massage therapy. The first involved 36 child and adolescent inpatients with a depressive disorder. Twenty-six of the depressed patients were assigned to receive massages and 10 to watch relaxing videos for 30 minutes each day over 5 days. Each massage session reduced depression immediately and over the 5 days, but the effects are difficult to evaluate because of the small sample size of the control group.[33] In the second trial, 32 depressed adolescents were assigned to either massage or relaxation therapy, consisting of ten 30 minute sessions spread over 5 weeks. Each massage session was found to have a significant immediate effect on depressed mood, but there was no sustained benefit over the 5 weeks.[34] In the third trial, 30 depressed adolescents were assigned to receive a single session of massage or listen to uplifting music. Both interventions had an immediate effect on electroencephalogram (EEG) asymmetry (which may be a marker for vulnerability to depression), but effects on depression were not evaluated.[35]

Conclusion: **Massage has an immediate effect on emotional state, but sustained effects on depression have not been demonstrated.**

Psychological or lifestyle treatments

Art therapy

Description: Art therapy is a psychological treatment using visual art to express thoughts and feelings.

Rationale: Art provides a medium for non-verbal communication with the therapist and the creative process of producing art is thought to be therapeutic.

Level of evidence: 2b.

Review of effectiveness: There has been only one controlled trial, which involved historical rather than randomised controls.[36] In this study, 39 suicidal inpatients aged 13–17 years were assigned to art therapy or to informal recreational activities. No effect on depressive symptoms was found at the end of therapy or at 1 month follow-up.

Conclusion: **On the limited evidence available, art therapy does not appear to be effective.**

Bibliotherapy

Description: Selected reading materials are used to assist a patient for therapeutic purposes.

Rationale: CBT has been shown to be effective in the treatment of depression. Cognitive behavioural bibliotherapy attempts to enable the patient to implement these same strategies through the use of books or audiovisual means. A meta-analysis in adults has found that bibliotherapy is superior to no treatment for depression in adults.[37]

Level of evidence: 2b.

Review of effectiveness: One non-blinded crossover trial in 30 people aged 14–18 years found bibliotherapy significantly reduced dysfunctional thoughts but not negative automatic thoughts.[38] The book used was *Feeling good: the new mood therapy.*[39]

Conclusion: **There is not enough evidence to recommend bibliotherapy. The use of adolescent-directed reading material should be evaluated, as adult studies indicate it is useful for mild to moderate depression.**

Distraction techniques

Description: Distraction techniques may help diminish rumination, and as a consequence, help alleviate depressed mood.

Rationale: Depression is frequently accompanied by rumination and worry about one's mood and its effect on functioning.

Level of evidence: 3b.

Review of effectiveness: One study measured self-reported depressed mood among adolescents with major depressive disorder ($n = 75$), non-depressed psychiatric participants ($n = 26$), and healthy controls ($n = 33$) who were exposed to both induced rumination and distraction conditions (the latter consisting of thinking about situations "external" to the body, such as a kettle boiling).[40] Participants reported greater depressed mood following the rumination compared with distraction.

Conclusion: **There is insufficient evidence to support the effectiveness of distraction techniques specifically for treating depression in youth, despite their integration into many cognitive behaviour treatments. Controlled studies comparing distraction with an appropriate control condition are required.**

Relaxation therapy

Description: Relaxation therapy involves a range of techniques to elicit the relaxation response. Probably the most common form is progressive relaxation, which teaches individuals to systematically identify and relax specific muscle groups.

Rationale: Relaxation therapy is primarily designed to reduce anxiety, but has been used with depression because of the high comorbidity of anxiety and depression.

Level of evidence: 2b.

Review of effectiveness: There have been two randomised controlled trials of relaxation therapy among depressed youth. In the first trial, 32 depressed adolescent mothers were assigned to either massage or relaxation therapy, consisting of ten 30-minute sessions spread over 5 weeks. Although relaxation was found to have an immediate effect on anxiety, there were no benefits for depressed mood.[34] In the second study, 48 depressed adolescents were randomly allocated to either CBT or relaxation training. At end-of-treatment, relaxation was inferior to CBT for reducing depression symptoms, but this effect was not sustained at 6-month follow-up.[41] There have also been some non-randomised studies. One allocated 51 children to cognitive reframing training, relaxation training or a control condition.[42] Relaxation training was provided for 1 hour a week over 5 weeks. Children in all conditions who scored in the depressed range pre-test had lower depression scores at 5-week follow-up. In another study, 40 hospitalised children and adolescents with depression who received relaxation therapy were compared with 20 depressed children who viewed a 1-hour relaxing videotape.[43] Relaxation training produced a reduction in anxiety, but no reduction in depression. There have been a number of other studies that have included relaxation training as a component of multimodal interventions; however, it is not possible to ascertain what the relaxation training specifically contributed.

Conclusion: **Relaxation may have an immediate effect on emotional state, but there is currently no evidence that it alleviates depression in children and adolescents.**

Discussion

An earlier review found supporting evidence for several CAM and self-help treatments for depression in adults,[12] but this review found limited evidence, mainly of poor quality, for such treatments in children and adolescents. The only treatment with reasonable supporting evidence is light therapy for winter depression. However, many others warrant further investigation, based on either compelling correlational evidence or their demonstrated efficacy with adults.

The paucity of evidence-based treatments for this age group is of particular concern given that there is a marked rise in the incidence of depressive symptoms and disorders during adolescence.[44] Not only is the emergence of depression during childhood and adolescence detrimental during these important life stages, but it has also been shown to have negative effects across the lifespan. This is attributable both to the continuity of symptoms into adulthood, and to the cumulative repercussions of early impairment on the young person's subsequent psychosocial functioning.[45-47] Treatments for children and adolescents with depression, whether conventional or CAM, have a critical role to play in ameliorating the presenting episode, and in preventing relapse and the emergence of chronic disability.

Despite the lack of evidence, use of CAM by children and adolescents is common.[13] It is likely that many patients are using the services of CAM providers without the knowledge of their practitioner.[48] An informed discussion about CAM with the patient or guardians can enhance the therapeutic alliance, and provide an opportunity for the clinician to discourage the use of potentially harmful CAM treatments, suggest potentially helpful ones, and monitor effects, both beneficial and harmful. However, the current state of the literature allows clinicians to provide the patient or their families with only limited advice about CAM treatments, despite their probable widespread use. The advent of mental health information via the Internet, which can be of widely variable quality,[49] renders this issue even more pressing.

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Competing interests

None identified.

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