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Review

# Reflexology: An update of a systematic review of randomised clinical trials

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ABSTRACT

Reflexology is a popular form of complementary and alternative medicine (CAM). The aim of this update is to critically evaluate the evidence for or against the effectiveness of reflexology in patients with any type of medical condition. Six electronic databases were searched to identify all relevant randomised clinical trials (RCTs). Their methodological quality was assessed independently by the two reviewers using the Jadad score. Overall, 23 studies met all inclusion criteria. They related to a wide range of medical conditions. The methodological quality of the RCTs was often poor. Nine high quality RCTs generated negative findings; and five generated positive findings. Eight RCTs suggested that reflexology is effective for the following conditions: diabetes, premenstrual syndrome, cancer patients, multiple sclerosis, symptomatic idiopathic detrusor over-activity and dementia yet important caveats remain. It is concluded that the best clinical evidence does not demonstrate convincingly reflexology to be an effective treatment for any medical condition.



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Reflexology is a popular [1]. It has been defined as "a Chinese and Indian system of diagnosis and treatment dating from 3000 BC... based on the belief that the whole body is represented on the foot (mostly on the soles of the feet), and that the internal organs can be stimulated by pressing particular areas of the foot (less commonly the hands)" [2]. Other authors have pointed out that "reflex in the context of reflexology means the 'reflection' of all the organs, systems and structures of the body onto the feet or the hands" [3]. By applying controlled pressure with their fingers, reflexologists aim to stimulate the body and promote health.

In 1997 and 2009, we published systematic reviews of the trial data pertaining to reflexology [4,5]. In the latter review, were able to include 18 randomised clinical trials (RCTs). Our conclusion from the totality of this evidence was that "it seems possible, even probable, that its perceived benefit is brought about by non-specific effects" [4]. Since then, several new RCTs have been published.

The aim of this update was to systematically summarise and critically evaluate the data from RCTs of reflexology as a treatment for any human condition.

## 1. Methods

### 1.1. Information sources and search

The following databases were searched from their inception to September 2010: Medline, Embase, Cinahl, British Nursing Index, Amed and Cochrane Library. Our departmental files were hand searched. The search terms were reflexology, Fussreflexzonen Massage (the German term), massage, and reflex therapy. No language restrictions were imposed. The bibliographies of all articles and

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our departmental files were hand-searched. All publications found were read either as abstract or full texts.

### 1.2. Article selection and eligibility

Non-randomised trials e.g. [6,7], studies of reflexology not delivered by trained reflexologists e.g. [8], studies of non-reflexology foot massage, e.g. [9] trials with healthy volunteers e.g. [10–12] and studies that related to the implantation of any devices into any parts of the body e.g. [13–15] were excluded. The key data from all included trials were extracted according to pre-defined criteria (Table 1) and their methodological quality was assessed by two independent reviewers using the Jadad score [16]. Because therapist-blinding is not an option in RCTs of reflexology, studies were considered "double-blind" if the patient and the evaluator of the results were blinded. A meta-analytic approach had been envisaged; however, it had to be abandoned due to the heterogeneity of the primary data.

## 2. Results

Twenty three RCTs met the inclusion criteria [17–38]. Their key data are summarised in Table 1. Fourteen of these studies failed to show that reflexology is an effective treatment [17–19,22,25–29,31,32,37,38]. Eight RCTs suggested positive effects [20,23,24,30,33–36] and one was unclear as to the direction of the result [21].

The methodological quality of these RCTs was variable but, in most cases, it was poor (Table 1). Many of the RCTs did not adequately control for non-specific effects [17–19,21,24,29,33,34,36,38]. Of the 11 placebo-controlled studies, 4 (36.3%) suggested specific effects of reflexology for symptom control in premenstrual syndrome, [20] improved quality of life during cancer palliation, [23] symptomatic treatment of multiple sclerosis [30] and low back pain [35]. The other 7 placebo-controlled RCTs failed to demonstrate specific therapeutic effects of reflexology as a treatment of asthma, anovulation, multiple sclerosis, post-operative state, cancer palliation, irritable bowel syndrome and menopause symptoms [22,25–28,37,39]. One placebo controlled study that favoured reflexology failed to provide between group differences [32].

Differentiating the RCTs by Jadad score, we found 14 RCTs with a score of 3 or higher [20,22,25–27,30–32,34–39]. Of these higher quality RCTs, 5 (35%) generated positive [20,30,34–36] and 9 (65%) negative results [22,25–27,31,32,37–39]. Most of the included RCTs had low sample sizes. Eight studies [22,26,29–31,34,36–38] involved more than 50 patients, and 8 trials had 30 or less participants [17,19,23,24,27,33,35,39]. Of the four RCTs [22,31,38] (with a sample size of 100 or higher), three (75%) generated negative results; [22,31,38] and one (25%) generated positive results [34].

The range of conditions being treated with reflexology was remarkably wide. For most of them, merely one single RCT was available. Only for asthma – two studies [19,25], post-operative state – two studies [17,22] cancer – 5 studies, [23,24,27,36,38] multiple sclerosis – 3 studies [30,37,39] and low back pain – two studies [31,35] were independent replications available. For asthma and multiple sclerosis, the results were contradictory – two negative [19,37,39] and one positive for multiple sclerosis [30] for cancer, three studies suggested benefit [23,24,36] while one was negative, [27] and for post-operative care, both RCTs failed to demonstrate effectiveness [17,22].

Both the interest to conduct RCTs and the methodological quality of the published RCTs seem to have increased during recent years. Seventeen RCTs have become available since 2000; 9 of these newer studies were placebo-controlled [23,25–28,30,32,35,37].

## 3. Discussion

Four systematic reviews [4,5,35,40] have previously assessed the value of reflexology. Our own evaluations [4,5] are now outdated and the present article is an attempt to update it. Hughes and co-workers published a review of massage techniques in paediatric cancer care [35]. Even though it included several RCTs of reflexology, its focus was not on summarising the totality of the evidence for or against reflexology. Wang et al published a systematic review of "the efficacy of reflexology" [40] and found that "there is no evidence for any specific effect of reflexology in any conditions". Unfortunately this systematic review failed to include the totality of the available data (5 RCTs included only).

All of these systematic reviews failed to produce convincing evidence to suggest that reflexology has health benefits beyond a placebo response and this is in line with our current update. Five RCTs have been published [34–38] since the previous review [5]. Three of those 5 RCTs favoured reflexology [34–36] and two failed to do so [37,38]. More than one RCT only exists for asthma, the post-operative state, multiple sclerosis, cancer palliation and low back pain. A general lack of independent replications must therefore be noted. The methodological quality of the RCTs was often poor. The majority of the high quality RCTs does not demonstrate effectiveness. The most promising evidence seems to be in the realm of cancer palliation [23,24,36].

Patient populations were heterogeneous ranging from postoperative patients, [17,22] headache, [18] asthma, [19,25] premenstrual syndrome, [20] and anovulation, [32] detrusor over-activity, [34] type II diabetes, [21] cancer patients, [23,24,27,36,38] multiple sclerosis, [30,37,39] low back pain, [31,35] irritable bowel syndrome, [28] foot oedema, [29] to menopause symptoms [26] and dementia [33]. Primary outcome measures differed also, ranging from blood cortisol levels, [17,39] or anxiety [24,27] headaches intensity and duration, [18] medication use, [19] blood sugar levels, [21] pain, [22,24,28,31,35–37] stress, [33] or life quality [23,25]. The frequency of reflexology in the included RCTs varied from 12–30 sessions, [18,21] to 21 sessions, [34] 11 sessions, [30] 10 sessions, [25,37] 9 sessions, [26] 8 sessions, [32,38] 6 sessions, [27,28,31,35,39] 5 sessions, [22] 4 sessions, [33] 3 sessions, [23,36] to 1 session [24]. The duration of each reflexology session ranged from 45 min, [34] 40 min, [35] 35 min, [21] 30 min, [20] to 20 min [36]. The follow up period varied between 3 days, [22] and 6 months [31]. Several studies failed to mention the length of follow up [17,24,29]. This level of variability, renders firm conclusions difficult.

Reflexology has been tested for a wide variety of conditions implying that reflexologists believe it to be effective in many different situations; however, specific medical claims should always be supported by sound evidence. In the case of reflexology, this is clearly not the case. The use of reflexology as a diagnostic tool has been questioned and claimed as biologically implausible [41,42]. Moreover, if employed as an alternative to treat serious conditions, reflexology can be life-threatening [43].

Reflexology treatment usually is a pleasant and relaxing experience [44]. There is also evidence to suggest that "a strong therapeutic relationship with providers who listen and provide time and knowledgeable advice" [45] might contribute to reflexology's popularity. In fact, [46] reported that 17 out of the 432 perimenopausal women (3.9%) and 119 of 2703 postmenopausal women (4.4%) used massage therapy. In a similar study of postmenopausal women, 32.2% of the 326 patients used massage for musculoskeletal pains and 39.3% for back aches [47].

This systematic review has several limitations. Even though efforts were made to find all relevant RCTs, we cannot be sure that this aim was achieved. Publication bias might have led to the disappearance of negative studies. In this case, the (already quite