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## Reflexology for Symptom Relief in Patients With Cancer

### KEY WORDS

Complementary therapies

Reflexology

Systematic review

Complementary therapies are increasingly being used in hospices and hospitals alongside orthodox treatments in an attempt to improve patients' emotional, spiritual, psychological, and physical well-being. An average of 31% of UK patients with cancer use some form of complementary therapy. Many UK cancer centers, out-patient units, and hospices are providing complementary services. There is strong anecdotal evidence that complementary therapies assist in the palliation of physical and psychological symptoms. This systematic review examines the research evidence base for the effectiveness of reflexology in cancer care. The study reports the results of a systematic review following the Cochrane principles of systematic reviewing. No meta-analysis was possible. Studies were retrieved from a comprehensive search of electronic databases from their start dates. An initial search was carried out in 2003 and updated in 2005 to 2006. Eligible studies were randomized controlled trials, controlled before and after studies, and interrupted time-series studies. Participants were adults with a diagnosis of cancer, receiving care in any healthcare setting. Interventions were limited to reflexology carried out by a qualified therapist as distinguished from another healthcare professional carrying out a reflexology intervention. Outcome measures were patient-reported levels of physical and psychological indices of symptom distress and quality of life (measured using validated assessment tools).

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Potential conflict of interest: Karen Lockhart was a researcher in one of the included studies (Ross et al, 2002).

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Accepted for publication January 7, 2008.

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## ■ Background

Complementary therapies are increasingly being used in hospices and hospitals alongside orthodox treatments in an attempt to improve the patients' emotional, spiritual, psychological, and physical well-being.<sup>1</sup> In healthcare, reflexology is probably one of the most frequently used complementary therapies.<sup>2</sup> Reflexology is defined as the systematic application of pressure to specific reflex points on the feet (or hands) with the intention of promoting homeostasis. Working from the premise that reflex areas in the foot (or hand) are linked to principal organs and glands via energy zones, it is presumed that the application of pressure to these areas releases congestion and promotes the flow of energy.<sup>2</sup> By enabling optimum circulation, helping to eliminate toxins, and aiding the major systems of the body (immune, nervous, and glandular), it is purported that the therapy helps to promote and restore balance.<sup>3</sup>

An average of 31% of UK patients with cancer use some form of complementary therapy.<sup>4</sup> Many UK cancer centers, out-patient units, and hospices are providing complementary services.<sup>1</sup> According to the Macmillan Cancer Support, the most common complementary therapies offered are massage, aromatherapy massage, reflexology, relaxation therapy/imagery, hypnotherapy, and acupuncture/acupressure.

There is a strong anecdotal evidence that complementary therapies assist in the palliation of physical and psychological symptoms. This systematic review examines the research evidence base for the effectiveness of reflexology in cancer care.

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## ■ Objectives

The objective of this study was to assess the evidence of reflexology in improving physical and psychological well-being in patients with cancer. Specifically, it aimed to determine the following:

- whether reflexology reduced physical symptoms such as pain, nausea, fatigue, and constipation,
- whether reflexology reduced psychological symptoms such as anxiety, and
- whether reflexology improved quality of life and produced any unwanted adverse effects.

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## ■ Methods

The search (summarized in Box 1) was undertaken according to Cochrane principles of systematic reviewing.

### Box 1

Electronic databases

The Cochrane Central Register of Controlled Trials (issue 2, 2002), MEDLINE, EMBASE, CINAHL, British Nursing Index, AMED, PsycINFO, SIGLE, CancerLIT, Dissertation Abstracts International

The following search terms were used:

*Reflexology, foot and massage, feet and massage, or zone therapy, and cancer, neoplasm, oncolog, palliat, terminal, or hospice*

## Data Sources

The databases which were searched (listed in Box 1) were used to obtain relevant studies for this review. No language restrictions were applied. MeSH keyword terms were modified as necessary for each database searched. The search was not restricted by the application of methodological filters in case this eliminated a number of the "best available" studies, should there not have been any trials which fully met the inclusion criteria.

## Inclusion Criteria

The review sought the following:

- randomized controlled trials (RCTs), controlled before and after studies, and interrupted time-series studies;
- adult participants with a diagnosis of cancer receiving care in any healthcare setting;
- reflexology carried out by a qualified therapist; and
- patient-reported levels of physical and psychological indices of symptom distress and quality of life (measured using validated assessment tools).

## Data Extraction

One reviewer screened the titles and abstracts and eliminated those which are clearly not relevant to reflexology. Two reviewers then independently screened the remaining titles and abstracts to derive a list of studies potentially eligible for inclusion in the review. When necessary, full copies of studies were retrieved. The full texts of all potentially eligible studies were obtained for independent review by 2 to 4 reviewers. Disagreements regarding inclusion or exclusion were resolved by discussion between the reviewers. Studies that met the inclusion criteria are described in Table 1; studies which were excluded and the reason of their exclusion at this stage are listed in Table 2.

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## ■ Summary of Results

The results are summarized in Table 1.

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## ■ Results

### Retrieved Studies

Three hundred and eighty-seven references were retrieved from the searches. Of these, 75 duplicates were identified and eliminated, leaving 311 for further consideration.

### Included Studies

#### DESCRIPTION OF STUDIES

The studies which were included were by Hodgson,<sup>5</sup> Ross et al,<sup>6</sup> Smith and Humphris,<sup>7</sup> and Stephenson et al.<sup>8-10</sup> The earliest reference from Stephenson<sup>8</sup> refers to an abstract for the thesis from which the 2000 study was published. Thus, 2 of the 3 references reflect one study.

✻ **Table 1 • Characteristics of Included Trials Comparing Reflexology With Placebo (in Alphabetical Order by First Author)**

Trial	Methods	Interventions	No. of Participants Who Were Evaluated	Immediate Effects After Intervention	Duration of Effect	Side Effects
Hodgson <sup>5</sup>	RCT comparing reflexology and placebo reflexology. Outcomes were measured on an unintentionally modified version of the Holmes and Dickerson scale.	Both interventions were administered by same trained reflexologist. Three sessions approximately 40 min each on study days 1, 3, and 5.	12	Significant differences were found between reflexology and placebo groups on the overall VAS score ( $P = .004$ ), with the reflexology group reporting most benefit, and on "breathing" ( $P = .026$ ). Nonsignificant improvement was reported in the reflexology group for appearance, appetite, breathing, communication (with doctors, family, and nurses), constipation, diarrhea, fear of the future, micturition, mobility, mood, nausea, pain, sleep, and tiredness.	Assessed: up to 24 h before and within 24 h after intervention	Not assessed
Ross et al <sup>6</sup>	RCT comparing reflexology with placebo reflexology. Outcomes were measured using the HADS and a 10-point unvalidated measure of symptom distress.	One reflexology session or basic foot massage (control) per week for 6 wk. Administered by one of 3 trained reflexologists. No data about the length of the sessions.	17	Both intervention and placebo groups showed a small decrease in total HADS scores between baseline and the end of the therapy, but there was no significant difference between the groups. Also, there was an improvement in mobility and appetite (based on unvalidated 10-point rating of symptom distress) in the sham reflexology group.	Not reported	Not assessed by RCT, but qualitative data found reports of foot discomfort, nausea, shaking, and sleep disturbance.
Smith and Humphris <sup>7</sup>	RCT comparing reflexology and placebo reflexology and a questionnaire-only comparison group. Outcomes were measured using	Patients in the experimental intervention received a weekly reflexology foot massage for the first 4 wk of their radiotherapy	129	Genuine reflexology was more beneficial than nonspecific foot massage on the POMS fatigue-inertia measure ( $P = .006$ ) and also on the Pearson-Byars	Not measured	Not assessed

*continues*

 **Table 1 • continued**

Trial	Methods	Interventions	No. of Participants Who Were Evaluated	Immediate Effects After Intervention	Duration of Effect	Side Effects
	POMS and the Pearson-Byars Fatigue Checklist.	treatment, those in the control group received a nonspecific foot massage over the same time period.		Fatigue Checklist ( $P = .002$ ). Compared with the questionnaire-only control group, patients receiving sham reflexology showed significant reductions in all but one (anger-hostility) of the POMS measures.		
Stephenson et al <sup>8</sup>	RCT with control group created by crossover. Pain was the primary outcome and was measured using the opioid converter which measured patients' analgesic use over 3 d.	Intervention was reflexology twice delivered, 24 h apart, by a trained reflexologist. The reflexology method used in the intervention was the Original Ingham Method.	26	Patients in the intervention group had lower pain scores after the intervention compared to their baseline score.	24 h. Reductions in pain were not sustained at 3 or 24 h postintervention.	Not assessed
Stephenson et al <sup>9</sup>	RCT with control group created by crossover. Pain was measured using the short-form McGill Pain Questionnaire. Anxiety was measured using the VAS for anxiety	As above	36	Significant decrease in anxiety in patients with breast and lung cancer ( $P = .000$ ). There was a reduction in pain for the breast cancer patients ( $P < .05$ on short-form McGill Pain Questionnaire). Most patients with lung cancer did not report pain as a problem.	58 h	Not assessed

Abbreviations: HADS, Hospital Anxiety and Depression Scale; POMS, Profile of Mood States; RCT, randomized controlled trials; VAS, Visual Analogue Scale.

The excluded studies that had warranted further consideration were excluded because of methodological reasons. One was based on anecdotal information,<sup>11</sup> 2 did not have a control group,<sup>12,13</sup> whereas another was not randomized nor did it have any baseline (pretreatment) data collection.<sup>14</sup>

## ■ Interventions

The interventions are summarized in Table 1. All these studies include limited information about the nature of the

reflexology included in the intervention, for example, limited or no information about which points were reflexed or avoided or the particular sort of reflexology practiced (eg, Ingham method).

## ■ Methodological Information

The methodological quality of the studies was assessed independently without blinding as to authorship or journal of publication using the checklists developed by Juni et al<sup>15</sup> and

**Table 2 • Table of Excluded Studies**

No. of Studies	Reason for Exclusion <sup>a</sup>
250	Not concerned with reflexology
28	Concerned with preferences for complementary therapies rather than outcomes
14	No new relevant results (mainly review and discussion papers)
9	Case studies
4	Case studies

<sup>a</sup>Details of the above excluded studies are available on request from the authors.

Jadad et al.<sup>16</sup> The quality items assessed as adequate, inadequate, unclear, or not used/reported were (1) selection bias which consist of the (a) generation of allocation sequences and (b) allocation concealment, (2) performance bias which consist of blinding of the (a) participants and (b) provider of intervention, (3) detection bias which consist of blinding of the outcome assessor, and (4) attrition bias. Sample size and follow-up duration were also used to assess the quality of studies. In addition, information on setting, participant characteristics, interventions, results, and any reported adverse effects were recorded. Information on methodology is provided in Table 3.

### Sample Size

The only study which explicitly reported that the sample size was based on a power calculation was the study conducted by Smith and Humphris.<sup>7</sup>

### Blinding

In the study of Hodgson,<sup>5</sup> single blinding was achieved by comparing reflexology with a “sham reflexology” gentle foot massage that did not stimulate reflexology points. By excluding participants with prior exposure to reflexology, it is possible that the blinding was successful. In the studies by Stephenson et al,<sup>8–10</sup> blinding was not possible, as a non-intervention control was used in a crossover design. In the study by Ross et al,<sup>6</sup> patients and interviewers were blinded but not the therapists. Smith and Humphris<sup>7</sup> achieved single blinding for the sham and genuine reflexology arms but not for the questionnaire control arm. They also ensured that the outcome measures were completed by patients not within sight of the investigator and placed in sealed envelopes in an attempt to reduce measurement bias.

**Table 3 • Summary of Methodological Information**

Trial	Blinding	Randomization Method	Informed Consent
Hodgson <sup>5</sup>	Single blind	No information provided	Yes
Ross et al <sup>6</sup>	Single blind	No information provided	No information provided
Smith and Humphris <sup>7</sup>	Single blind	Random numbers table	Yes—written
Stephenson et al <sup>8</sup>	N/A—crossover design	Unclear	Yes
Stephenson <sup>9</sup>	N/A—crossover design	Toss of a coin	Yes

Abbreviation: N/A, not applicable.

A qualified reflexologist who was not the researcher undertook interventions in the study of Hodgson.<sup>5</sup> The researcher in the study of Stephenson et al<sup>8–10</sup> who was also a qualified reflexologist provided the interventions. Ross et al<sup>6</sup> also separated the measurement from the intervention with 3 trained reflexologists providing the intervention (both genuine and sham) and independent interviewers collecting the data.

### Attrition/Intention to Treat or per Protocol Analysis

Ross et al<sup>6</sup> report that of the 26 patients who were randomized, 17 were evaluable. One patient had no baseline measures recorded, one withdrew because of problems in attending treatment, and 7 died during the study period. No information was provided about the basis for the analysis although it appears that the analysis was carried out only on the 17 patients who completed the 6-week study.

Smith and Humphris<sup>7</sup> reported that 21 participants withdrew from the study mainly because they did not complete all the required questionnaires. The analysis was carried out on an intention-to-treat basis.

Stephenson et al<sup>8</sup> reported that 20% of the patients who were invited declined to join the study but did not provide any information on their reasons for declining.

Hodgson<sup>5</sup> reported that 10 additional patients preferred not to participate, were unable to participate in the study, or were ineligible.

### Consolidated Standards of Reporting Trials Guides for Reporting

In addition to the guides to quality assessment provided by Juni et al<sup>15</sup> and Jadad et al,<sup>16</sup> the articles were examined against the Consolidated Standards of Reporting Trials (CONSORT)<sup>17</sup> statement for reporting of RCTs. It should be noted that the most recent article by Stephenson et al<sup>8</sup> appeared as a “research brief,” which meant that the information was summarized rather than appearing in detail. Information was obtained through personal communication to decide whether the study met the inclusion article.

### Outcome Measures

The authors acknowledge that the validity of outcome measures is questionable in the study of Hodgson<sup>5</sup> because al-

though a validated scale was used (Holmes and Dickerson), 5 items from the 28-item scale were inadvertently omitted. All other outcome measures are summarized in Table 1.

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## ■ Discussion

The paucity of data in the 5 trials of reflexology means that no firm conclusions can be drawn about the effectiveness of the intervention for the relief of cancer treatment symptoms and comorbidities. Although the available evidence is limited, it does suggest that reflexology may confer benefits to people with cancer over those offered by a foot massage or no-intervention control; although in some cases, patients received considerable benefit from nonspecific foot massage. These benefits were noted in overall symptom reduction, with specific reductions in breathlessness, fatigue anxiety, and pain. It must be emphasized, however, that the follow-up period of studies were short; thus, long-term effects are unknown. In addition, none of the studies systematically measured adverse effects, so it is not possible to suggest detailed guidance about contraindications.

The studies of Hodgson<sup>5</sup> and Stephenson et al<sup>8-10</sup> were small trials with short-term follow-up. However, their results suggest that people with cancer who received reflexology might have benefits compared to those who were offered with foot massage or had no intervention. They found that the observed improvements were not sustained in the studies, including a follow-up assessment. Likelihood of bias occurred in these studies. No comparisons were possible to determine if repeated treatments confer additional benefits. In addition, none of the studies sought to record adverse effects.

The larger study conducted by Smith and Humphris<sup>7</sup> shows little difference between patients receiving authentic reflexology and those receiving sham reflexology, with both groups benefiting more than the questionnaire-only group.

The study of Ross et al<sup>6</sup> found that palliative care patients seemed to benefit more from the sham reflexology than from genuine reflexology.

The fact that there were no positive differences in favor of reflexology between sham and authentic reflexology is attributed to the nonspecific effects of the intervention with both groups of patients benefiting from the opportunity to discuss their concerns and fears. The studies which showed that patients benefited almost as much or more from nonspecific foot massage when provided by trained reflexologists than from genuine reflexology raise important questions about nonspecific effects (common to all practitioner-based complementary therapies) about the active ingredient in reflexology and the relative cost-effectiveness of the use of trained reflexologists; these findings were not dependant on sample size or methodological quality. None of the studies looked at the effect of foot massage provided by staff untrained in reflexology; the specific effect of using trained rather than untrained staff is a potentially fruitful area for future research.

We were unable to make any assessment on the relative merits of different types of reflexology because this level of

detail was not provided; it is likely that different forms of reflexology were used, and this also contributes to the heterogeneity of the data. The different settings and tumor sites included in the review reflect the variety of settings in which all cancer patients receive complementary therapies but may also have increased the heterogeneity of the total sample.

Another possible consideration for future research is to incorporate an attention control arm as well as a sham reflexology arm to identify the specific action of reflexology over a practitioner-based placebo.

Most of the studies which were reviewed had small sample sizes (median, -45.2) and, in all samples, were recruited at a single site, this casts doubt on the degree of generalizability which can be drawn from the results.

It is encouraging that 5 RCTs exist for the efficacy of reflexology for cancer patients, but several methodological issues still require resolution. The sample sizes in all but one of the studies were small, and the follow-up periods were very limited. Possibility for bias occurred in the 2 earliest studies because of unclear randomization methods and lack of allocation concealment, and in 2 studies, interventions and outcome assessments were conducted by the same researcher. One study provided a single reflexology treatment, whereas another provided a series of 3, but no comparisons were possible to determine if repeated treatments confer additional benefits. There were also considerable differences in the time periods over which the treatments were spread.

The studies included in the review cover a long period. It is promising to note that over the time span covered by the review, there have been methodological improvements in the studies. This is particularly evident in the studies by Stephenson et al,<sup>8-10</sup> where the authors improved the study design in each subsequent study; in all cases, the most recent studies are more methodologically robust than the earlier ones. The most recent study<sup>7</sup> had the largest sample size and was well designed; considerable efforts were made to ensure methodological rigor in spite of the constraints of the limited funding of PhD research. Although quality has improved, there seems to have been a decline in the quantity of studies. It could be that the equivocal results of early research may have dampened subsequent enthusiasm for research in this area.

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## ■ Conclusion

This review set out to answer some specific research questions about the effectiveness of reflexology in alleviating physical and psychological symptoms, whether reflexology improved quality of life and whether there were any negative side effects. It proved impossible for a dataset of 5 studies to provide clear answers to any of these questions. Not all the questions were addressed in every study, and all the studies had methodological limitations including the heterogeneity of the data. The overall conclusion of this review is, therefore, that no definitive conclusions can be drawn due to the methodological limitations of the studies. The review indicates that more studies of methodologically high quality are needed in this area.

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## ■ Ethical Approval

Ethical approval was not required, as no participants were needed for this review.

### ACKNOWLEDGMENTS

The researchers gratefully acknowledge the help and advice received in developing the search strategy from Enid Forsyth, Librarian at the Royal College of Nursing, Scotland. They also acknowledge the assistance of Frances Fairman and the Cochrane Collaboration in reporting this review.

The authors thank the early input of Deborah Fellowes to the formulation of the research question and early work on scoping exercises.

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