



# Use of reflexology in managing secondary lymphoedema for patients affected by treatments for breast cancer: A feasibility study



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## ABSTRACT

**Purpose:** The aim of this feasibility study was to examine the use of reflexology lymphatic drainage (RLD) in the treatment of breast-cancer related lymphoedema (BCRL) with a view to further research. **Methods:** An uncontrolled trial was conducted with 26 women who had developed lymphoedema in one arm following treatment for breast cancer. Changes in upper-limb volumes and in participant concerns and wellbeing were measured. Qualitative data were also collected. **Results:** A significant reduction in the volume of the affected arm was identified at follow-up compared to baseline. This reduction in volume appeared to be maintained for more than six months. Participant concerns were significantly reduced and their wellbeing significantly increased. No serious adverse effects were reported. **Conclusions:** RLD may be a useful intervention for BCRL although the results could not be attributed to the reflexology intervention because of research design limitations. The main conclusion was, however, that there was sufficient evidence for further research using a randomized controlled trial.

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## 1. Introduction

Secondary lymphoedema of the upper-limb is a pernicious and often persistent side effect of curative treatment for breast cancer [1–3]. A recent review of incidence estimates [4] concluded that about 1 in 5 women surviving breast cancer will develop arm lymphoedema although estimates vary particularly with the extent of surgical treatment and body mass index [4,5], and also with the measurement of lymphoedema by different methods [6,7]. The incidence of breast-cancer related lymphoedema (BCRL) appears to increase for up to two years after breast cancer diagnosis or surgery [4], and as cancer survival improves the prevalence of BCRL is likely to increase.

BCRL remains a significant quality of life issue [3,8] and its development is associated with diminished strength, fatigue, and pain in the affected arm [2,3,9]; impaired functional ability, loss of self-confidence, and poorer emotional wellbeing [3]. To address these needs it is important that patients with mild symptoms are referred to the appropriate specialist [1], early detection and

treatment is likely to lead to more effective management [8,10].

There is no known cure for BCRL and although the optimal treatment protocol remains controversial [8,11], there is broad agreement that the best approach is holistic and multidisciplinary [10]. There is a range of interventions for secondary lymphoedema but this discussion will be restricted to conservative (non-surgical and non-pharmacological) treatments. Firstly, there is moderate evidence of reduction in lymphoedema volume with the use of compression garments and compression bandages [12,13]. However, the evidence base is surprisingly low given that these practices are widespread. Some minor adverse effects have been reported [11], but there appears to be little or no reporting about possible psychological discomforts of compression therapy or adherence to its use.

There is strong evidence that increased exercise is safe [14,15] and can improve physical fitness, functioning and quality of life for those diagnosed with BCRL [13]. One study has indicated that exercise may also reduce arm volume [16], and a review concluded that low physical activity is itself a risk factor for developing arm lymphoedema [4].

Current evidence does not support the use of manual lymphatic drainage (MLD) as a stand-alone intervention for preventing or

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treating BCRL [17]. The addition of MLD to compression therapy may help to reduce arm volume [13] and early physiotherapy treatment programmes that include MLD may assist the prevention of secondary lymphoedema [18] but no firm conclusions can be drawn from the available evidence [19].

Finally, two studies examining nutrition and dietary interventions for lymphoedema have been reviewed [13], both demonstrated positive effects on lymphoedema volume reduction. The reviewers concluded that physical activity and healthy eating may help to reduce BCRL and have additional health benefits.

There is evidently a need for further effective conservative interventions and for more research into the management of BCRL. Reflexology is a form of complementary healthcare used by patients with cancer [20]. A reflexology treatment typically involves applying pressure to specific areas on the feet using thumb, finger and hand techniques [21]. Although the evidence-base is insufficient [22], a number of studies have indicated that reflexology may benefit the physical and emotional symptoms of patients with cancer [23–26].

An early review of five randomized controlled trials (RCTs) found that no definitive conclusions could be drawn but the available evidence suggested that reflexology may confer symptom relief to people with cancer over those offered by foot massage or no intervention [25]. Since this review, a RCT with 183 women with early breast cancer randomized to three comparison groups concluded that reflexology appeared to have clinically worthwhile effects on their quality of life [24]. This RCT was identified as the only study with a low risk of bias included in a more recent review of the effectiveness of reflexology for the symptomatic treatment of breast cancer, however it was deemed unable to demonstrate the specific effects of reflexology because of the nature of its design [23].

Finally, in a trial of the safety and efficacy of reflexology, 286 women with advanced-stage cancer were randomized to three groups: reflexology, lay foot manipulation (LFM), or conventional care [26]. The findings indicated that both reflexology and LFM were safe even for the most fragile patients with advanced-stage breast cancer. Dyspnoea was identified as the main symptom which was significantly improved by use of reflexology. Both reflexology and LFM improved physical function and symptoms of fatigue compared to controls. Significant effects were not found for nausea, pain, depression, or anxiety.

The current research arose from the clinical experience of a reflexologist working with women with BCRL, where patient reports of benefits led to an exploratory evaluation of six cases in a palliative care setting. Although the results were encouraging it was concluded that more data were needed to justify a controlled trial. The following feasibility study aimed to examine the efficacy of reflexology in thirty patients with breast cancer and secondary lymphoedema.

## 2. Methods

### 2.1. Design

Uncontrolled trials are used to establish whether clinical effects warrant further investigation and to provide data on effect sizes [27]. There is little published guidance on sample sizing for pilot or feasibility studies [28] sample sizes varying between 24 and 50 have been recommended [29–31]. This study used a single-subjects experimental design (SSED) [32] and aimed to recruit 30 participants. Data were collected before reflexology intervention began (Phase A1) to give baseline measures for individual participants against which measures taken after intervention (Phase B) and at follow-up (Phase A2) were compared. Efficacious change

was measured in terms of limb volume reduction, decreased concerns and increases in wellbeing.

### 2.2. Participation

A convenience sample of 36 women over the age of 18 years volunteered to participate at three discrete sites in Wales, UK: two cancer-care centres and a University Complementary Healthcare Clinic. Participants were included if they had undergone axillary lymph node dissection and had developed secondary lymphoedema in one arm. Women who had undergone a double mastectomy were excluded. Consequently 28 women were recruited and underwent a consultation with a reflexology practitioner where they were asked about their general health in accord with the professional body code of practice and ethical guidelines. Two participants dropped out for personal reasons (their data were not used), and the remaining 26 participants were distributed across the three sites: Cardiff (n = 15), Bridgend (n = 6), Tredegar (n = 5).

### 2.3. Treatment protocol

Each of the 26 participants received reflexology lymphatic drainage (RLD) treatments weekly for four consecutive weeks from three reflexology providers trained in the protocol by the study's lead reflexologist. The RLD protocol included 40-min of stimulation to specific zones on both feet. The reflex areas presumed to correspond to the lymphatic and renal systems were worked, firstly on the foot ipsilateral with the unaffected, *normal* arm using a range of finger and thumb techniques. The same sequence was then performed on the other foot corresponding to the lymphoedema, *swollen* arm and, finally, the sequence was repeated on the first foot. All participants continued to receive their usual care from their lymphoedema service providers.

### 2.4. Data collection

Consent was taken and data gathered by a research associate especially recruited to the study and naïve to the practice of reflexology.

Limb volume data were collected for the swollen arm and the normal arm for each of the 26 participants at 11 data collection points as shown in Table 1: three at baseline; four immediately before treatment (the first of which was also a baseline measure); four immediately after treatment; and one at follow-up a week after the final treatment. All 26 participants were requested to provide a second follow-up and 22 responded. Their response times varied; the mean number of days between the first and second follow-up measures was 195 days (min. 97, max. 277).

The technique of circumference measurement using a tape measure was used to collect volume data for the swollen and normal arms. This is the most commonly used method in the UK [33] and in the current study comprised measuring circumferences starting 2 cm above the wrist joint and then at 4 cm intervals as far as the axilla. These measurements were then used to calculate the volume of the limb as a cylinder based on the formula  $v = \pi r^2 h$  simplified to  $v = \frac{\text{circumference}^2}{\pi}$  (because the circumference of a circle is equal to  $2\pi r$ , and  $h$  equals 4 cm in this instance). In practice, each circumference measurement was squared and the sum of squares divided by Pi to give the limb volume. Water displacement has been regarded as the standard method for accurate measurement of limb volume [34] but it was deemed impractical for the frequent measurements required in the current research. Strong correlations have been reported between circumference measurement and water displacement methods [35], although the methods cannot be used interchangeably for limb volume calculations [36].

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