A multiconvergent approach to the rehabilitation of patients with chronic fatigue syndrome: a comparative study

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Abstract

Objectives This study investigated the efficacy of a rehabilitation technique for the treatment of chronic fatigue syndrome that was developed by a physiotherapist. Data collected retrospectively from a pilot study indicated that patients benefited from this multiconvergent approach, so further assessments were warranted.

Design Treatment efficacy was assessed by comparing the primary and secondary outcome measures of patients attending multiconvergent therapy (MCT) with those of patients attending relaxation therapy and a group of non-intervention controls.

Setting The active treatment took place at a clinic within the physiotherapy outpatient unit. Relaxation therapy and all assessments were conducted at the psychology unit.

Participants Thirty-five participants, fitting the Centers for Disease Control and Prevention criteria for chronic fatigue syndrome, were recruited from two outpatient clinics and an existing patient panel.

Intervention Patients were assigned to either MCT (n = 12) or relaxation therapy (n = 14). Nine participants who received general medical care were used as a comparison group.

Main outcome measures The Karnofsky performance scale was used as the primary outcome measure of function. Secondary outcome measures assessing overall improvement in patient condition, fatigue and disability levels were also administered.

Results A significant percentage of the patients attending the MCT sessions showed improvement in the primary outcome score used to measure the success of the treatment (MCT = 83%, relaxation = 21%, controls = 0; P < 0.001). A significant percentage of this group also reported improvement in their overall condition (MCT = 92%, relaxation = 64%, controls = 22%; P < 0.001), lower fatigue levels (MCT = 83%, relaxation = 57%, controls = 11%; P < 0.001) and lower levels of disability (MCT = 75%, relaxation = 43%, controls = 11%; P = 0.032) immediately post-therapy. In addition, these improvements were maintained at 6-month follow-up.

Conclusions Outcomes from this small preliminary study were encouraging. The multiconvergent approach produced significant improvements for standardised primary and secondary outcome measures. Further research is required to examine the efficacy of this approach over time, and its effectiveness on a larger scale within the primary healthcare setting using additional therapists trained in the technique.

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Keywords: Chronic fatigue syndrome; Cognitive behaviour therapy; Graded exercise therapy; Rehabilitation

Background

Chronic fatigue syndrome (CFS) is an illness that produces a marked reduction in activity and an increase in mental fatigue. It is also accompanied by four or more co-existing symptoms including those of a cognitive or neuropsychiatric nature. The illness (by definition) must be of at least 6 months duration and of sufficient severity to cause substantial functional impairment [Centers for Disease Control and Prevention (CDC) criteria] [1]. The symptoms associated with the illness can be very debilitating and persistent with little spontaneous recovery [2,3].

Evidence from a review of epidemiological studies [4] suggests that, in large-scale surveys, up to half of the general population would report suffering fatigue-like symptoms during their lifetime. Twenty percent of these would subsequently seek medical care. However, in the majority of cases,
the fatigue experienced could be explained by other mitigating circumstances and, therefore, the incidence of CFS in the general population is relatively low. The low incidence should not, however, detract from the severe effect that the illness has on the individual sufferer. The decrease in personal, occupational and social activities that accompanies the illness instils a sense of frustration and hopelessness within the patient. In addition, financial concerns have been raised regarding the increased uptake of unemployment benefits and the drain on healthcare resources brought about by the illness [5,6].

As both the cause and the pathophysiology that maintains CFS are unknown, treatments have been investigated on a pragmatic basis. Previous research has suggested that once CFS is established, cognitive, behavioural, emotional, physiological and social factors work together to perpetuate the illness [7]. In addition, studies into the cognitive deficits associated with CFS have suggested that the impairment in functioning observed in CFS is similar to that seen in sleep disorders and physical deconditioning [8]. It is not surprising, therefore, that systematic reviews of possible management protocols for CFS cite approaches such as cognitive behaviour therapy and graded exercise therapy as the most consistently effective forms of intervention for this illness [9]. Indeed, studies investigating the efficacy of cognitive behaviour therapy have verified this in 68% of trial participants. Furthermore, this statistic compares favourably with the 36% of patients reporting benefit from relaxation therapy [10]. Similarly, exercise therapy has shown great promise for improving illness outcome in CFS patients [11]. Significant changes in functional status and general fitness are indicated when applying this approach to CFS. In addition, it has been demonstrated that simply educating patients about the benefits of exercise can also increase levels of activity in sufferers [12]. The use of cognitive behaviour therapy and graded exercise therapy (separately or in combination) as treatment strategies for CFS has, therefore, been the subject of several randomised controlled trials.

A clinic was set up at a physiotherapy outpatient department in 1991 to provide a service specifically for patients whose condition did not respond to first-line medical intervention and for patients where no solution was readily available. Multiconvergent therapy (MCT) was developed to tackle a wide range of medically unexplained symptoms including tinnitus, vertigo, anxiety, hyperventilation syndrome and irritable bowel syndrome.

The MCT regime described in the current study reflects Engel’s biopsychosocial and philosophical approach to health outcome [13]. The therapy also mirrors the work of physiotherapists in the field of chronic pain management who advocate a more active integrative role for therapists in the assessment and management of beliefs and emotions [14,15].

The success of MCT in the management of tinnitus and irritable bowel syndrome [16,17], which are often reported as co-existing symptoms within CFS, prompted the inception of a pilot study to ascertain its suitability in the treatment of CFS. Participants for the study were recruited from a CFS research outpatient clinic specifically set up to investigate all aspects of the illness.

Anecdotal reports from the pilot study indicated that sufferers were benefitting from the treatment. Therefore, a retrospective study was conducted on the 28 patients who had taken part in the scheme for quantification. Each patient received a questionnaire through the post. The objective of the study was to produce a quick and effective outcome measure to elicit their overall CFS status. Eighteen of the 28 patients (64%) responded to the follow-up call both post-therapy and 2–3 years later. Five of the 10 non-responders had moved away with no forwarding address, and the remainder did not reply. This resulted in an 82% response rate based on contactability. At the post-therapy time point, 16 of the 18 respondents regarded their CFS as ‘better’ (88%) and two respondents reported no change in their condition (22%). At 2–3-year follow-up, 13 of the 18 respondents continued feeling better (72%), one reported no change in their condition (5%), and four (22%) reported feeling ‘worse’ [18].

Although these exploratory findings were encouraging, additional, more rigorous studies were needed. The logical progression for the research, and the aim of the current study, was to test the efficacy of the combination therapy (MCT) by incorporating measures validated in previous studies into CFS treatment efficacy. The primary and secondary outcome measures chosen for the current study had been widely used and validated in previous treatment trials for CFS [10,19], which enabled comparison of MCT on a like-for-like basis. In addition, similar comparison groups were employed as used in previous treatment trials.

Methods

Design

Between-group comparisons were used to assess the efficacy of MCT compared with the relaxation and control groups both immediately post-therapy and at 6-month follow-up.

Participants

Appropriate ethical approval was granted by the local health authorities covering the outpatient clinics. All of the participants in the study were recruited through a single consultant physician who had diagnosed their condition. Referrals to the specialist clinic followed standard National Health Service protocol. On attending the clinic, each patient was informed of the nature of the study and invited to participate. Recruitment continued until the closure of the clinic in 2001. Subsequent volunteers were recruited from an infectious diseases outpatient clinic run by the same physician.

The participants were made aware at the initial consultation that they would not receive further appointments with the attending physician until the 6-month post-therapy assess-
ment point. This was not to say that the patient was denied medical care, but if it was necessary for the patient to revisit the clinic before the 6-month follow-up appointment, they could no longer take part in the study. Informed consent was obtained from all patients participating in the study. It was made clear that it was possible to withdraw from the study at any stage without repercussions.

As relaxation therapy had already been used to alleviate the symptoms of CFS with some success (see below), it was decided that a separate control group would be necessary to act as further comparison. The control group comprised CFS patients who received standard medical care. Their data were used as an estimate of the untreated illness.

Inclusion criteria
The inclusion criteria for the study were that participants had to: (1) meet the CDC criteria for CFS [1]; (2) be willing to attend all therapy and assessment sessions; and (3) have a Karnofsky performance score of 70% or less [19]. A score of 70% or less implies functional impairment at a level that makes full-time employment impossible.

Exclusion criteria
Patients were excluded from the study if their fatigue was due to other mitigating circumstances.

Sample size
Sample size calculations based on previous work suggest a recovery rate of 72% among those receiving MCT [18] compared with 6% for untreated controls (data from ongoing longitudinal study). Therefore, a study of eight MCT recipients and eight controls would have an 80% chance of detecting a treatment effect at the 5% level of statistical significance.

Materials
Primary outcome measure
The main indicator for successful treatment outcome was the Karnofsky performance scale, as used by Sharpe et al. in their randomised controlled trial of cognitive behaviour therapy for the treatment of CFS [19]. Here the patient is categorised according to their functional performance on a scale of 0–100%. Karnofsky performance data were collected at the initial clinic visit (baseline) and at 6-month follow-up by the consulting physician. Success of the treatment was measured by the attainment of a score of 80% or more at 6-month follow-up and/or an improvement in performance scores of 10% or more at this time point.

The Karnofsky scale was also presented to patients at baseline, immediately post-therapy and at 6-month follow-up. The scale was modified, however, by removing the more catastrophic lower elements. This enabled the authors to assess the ability of patients to monitor improvements subjectively.

Secondary outcome measures (global measures of illness and satisfaction with treatment)
Patients rated any improvements in their condition immediately post-therapy. Ratings of overall improvement in their condition and changes in fatigue and disability were recorded on Likert-type scales [10]. Each scale ran from extreme negative through ‘no change’ to extreme positive responses. In addition, patients were asked to rate any further changes from the post-therapy measures at 6-month follow-up using the same scales.

Patients rated the usefulness and their satisfaction with the treatment on Likert-type scales, and were also asked if they would recommend the therapy to other CFS sufferers.

Procedure
Each patient attending the clinic was assessed by a consulting physician specialising in CFS. If the patient met the study criteria, they were invited to take part in the study and their baseline Karnofsky performance score was recorded. All further treatment protocols and patient assessments were conducted at either the physiotherapy outpatient department (MCT) or the psychology research unit (relaxation and control).

The two treatment groups received approximately 10 1-hour sessions on a one-to-one basis. Ten sessions were chosen for two reasons: this represented the length of the relaxation protocol; and the MCT technique typically ran for eight to 12 sessions (depending on the needs of the patient). The control group was assessed over a similar time period based on attendance at 10 weekly sessions.

The patients were re-interviewed by the consulting physician at 6-month follow-up with their functional performance score duly recorded. Patient-rated primary and secondary outcome measures were also collected immediately post-therapy and at 6-month follow-up. Data collection for the study took place over an 18-month period.

Treatment assignment
Due to the small numbers in the study, patients recruited into the trial were assigned to a treatment group individually. Referral letters for both the MCT clinic and the relaxation therapist were prepared for each patient who agreed to participate. These were placed in envelopes addressed to both therapists. Both envelopes were then placed into a larger blank envelope. One envelope was selected by a colleague who was blinded to the study’s protocol. The blank envelope selected was opened and the letter was sent to the appropriate therapist. The other letter was shredded. The patient was contacted by the chosen therapist and subsequent assessment appointments were made through a third party.

The control group was recruited separately from the active arms of the study. Due to the imminent closure of the CFS clinic, it was decided to complete as much of the active arms of the study as possible before recruitment of the non-intervention control group. The controls comprised members
of the CFS research panel who had been recruited for previous studies carried out at the centre.

Masking
Both the consultant physician recruiting the patients and the researcher conducting the assessments remained blind to the therapy group of each participant until after the 6-month follow-up assessment when the treatment codes were revealed.

MCT rationale
MCT employs cognitive behavioural therapy and graded exercise therapy in combination with appropriate interventions to improve sleep quality and to treat any comorbid mood disturbance.

The cognitive behaviour therapy aspect of MCT aims to identify factors that can be seen to predispose, precipitate or perpetuate the illness and improve sleep quality. This phase of MCT also involves cognitive restructuring of dysfunctional beliefs, thoughts and behavioural patterns whilst re-inforcing positive beliefs, thoughts and behavioural patterns.

The graded exercise phase of MCT involves the introduction of planned activity and rest (referred to as ‘pacing’). Non-prescriptive graded exercise is introduced after the patient has explored the relationship between fatigue and cognition. The rationale follows a model similar to that suggested by Noakes et al. who hypothesised that physical activity and the recruitment of skeletal muscle units is controlled by a continuous pacing strategy within the central nervous system based on its feedback from physiological and psychological systems [20]. Gentle walking is introduced every second day at a level appropriate for each person in order to prevent postexerciseional malaise. The distance and time walked is increased as the patient’s confidence grows. The patients themselves are responsible for increasing the level of exercise and providing feedback at the therapy sessions.

Mindfulness (or insight) meditation is also blended with the cognitive behaviour therapy/graded exercise therapy approach. Patients are encouraged to fix their thoughts in the present without being distracted by the associations attached to those thoughts or sensations (such as pain), and, as a result, are able to reduce the suffering associated with physical somatic disorders [21–23]. Patients can then use the technique during times associated with heightened awareness of pain or fatigue (such as during exercise). In addition, this method can be used to reduce any intrusive thought patterns experienced at night that prevent the patient from falling asleep [24]. This technique has proved useful in other conditions associated with pain, immune function, sports and cardiopulmonary function [25–28].

Heart rate monitors are used during the sessions to act as a symbol of fitness and wellness, to help vulnerable patients from deteriorating into a ‘boom and bust’ scenario, and to assess the relaxation response [24]. The monitors enable identification of the average peak heart rate for each patient whilst exercising at a sustainable level, and also establish cardiac rhythm. The monitors are not used to promote exercise within a given range for a number of reasons: (1) recent studies on exercise in fibromyalgia (a condition which overlaps substantially with CFS) show little correlation between cardiovascular improvement and improvement in CFS [29,30]; (2) the effect of stress on some patients with CFS may lead to chronic overbreathing (PaCO2 < 30 mg CO2) during exercise (unpublished data from the CFS clinic); and (3) although improvements in patients with CFS have been observed in previous graded exercise therapy trials, exercise should not be insisted upon in all cases [11].

Relaxation therapy rationale
The relaxation procedure used in this study is based on the work of Ost [31]. The use of the rapid relaxation technique has not been limited to CFS but has proved successful for a wide range of problems such as tinnitus and pain. The aim of this type of procedure is to help patients to target specific areas of the illness, thus facilitating symptom relief. Rapid relaxation, therefore, offers the patient a way of coping with and managing their symptoms. The therapist guides the patient through the relaxation technique over a period of 10 weeks, with each session revising the previous session before moving on to a different major muscle group. Relaxation therapy has been favoured by various centres and patient groups (e.g. Action for ME) throughout England, Scotland and Wales, and has been used as a comparison by other research groups [10].

Data analysis
Chi-squared tests (χ²) were used to compare the proportions in each group attaining normal function (80%) on the Karnofsky scale and/or an improvement of 10% or more from the baseline scores. The effect of MCT on the secondary outcome was also assessed using χ² tests (post-therapy and 6-month follow-up).

Results
Patient demographics and illness history
Of the 87 possible participants attending the CFS clinics during the recruitment phase of the study, 40 patients took part in the study. The remainder either: (1) did not meet the study criteria; (2) did not have CFS; or (3) refused to participate. Seventeen participants were assigned to MCT, 14 to relaxation therapy and nine to the control group. Five subsequently withdrew from the study: one due to family problems, one strongly believed that they were not suffering from CFS, and three failed to attend their first therapy session. All five had been assigned to the MCT group. The patients who did not attend the first treatment session were contacted on three separate occasions but did not respond to the therapist’s correspondence.
Table 1 shows patient demographics, illness history and psychopathology scores for the three groups at baseline. These data provide the typical demographic characteristics usually associated with CFS, namely that the sample was comprised predominately of married females in the fourth decade of life. There were no significant differences between the groups, although length of illness and depression scores [32] approached significance (P = 0.08 and 0.10, respectively). There were no significant demographic or clinical differences between the five participants who withdrew from the study and those who completed the study.

The Karnofsky performance scale (primary outcome measure)

Table 2 shows the data recorded by the patients and the physician at initial clinic interview (baseline). The consultant rated all of the study participants between 60% and 70% on the functional performance scale. Although the patients were more likely to rate themselves on the lower elements of the performance scale, these data were not significantly different.

At the post-therapy time point, significantly more patients from the MCT group had attained normal functioning (i.e. a Karnofsky score of 80% or more) for the consultant-rated performance scores. This was also true for those attaining improvements of 10% or more.

This was mirrored in the patient-rated performance scores for both 80% functioning and 10% functional improvement (see Table 3).

There was no significant difference between the groups in terms of patient-rated performance scores immediately post-therapy for attainment of 80% or improvement of 10% or more.

Although these findings should be interpreted cautiously and could not be pursued further because of the small numbers involved, it appears that the association is robust.

Secondary outcome measures

Global assessment of function and satisfaction with treatment was made immediately post-therapy and at 6-month follow-up by the patient groups. At the post-therapy time point, the MCT group reported significantly greater improvement in their overall condition than the relaxation or control groups [χ² = 13.637, degrees of freedom (df) = 4, P = 0.009, MCT = 92%, relaxation = 64%, control = 22%]. This finding was repeated for the other two global outcome measures: (1) fatigue [χ² = 20.652, df = 4, P < 0.001, MCT = 83%, relaxation = 57%, control = 11%]; and (2) percentage reduction in disability [χ² = 9.699, df = 4, P = 0.046, MCT = 75%, relaxation = 49%, control = 11%] (see Figs. 1–3).

At 6-month follow-up, the global outcome measures clearly show the longer-term benefits of MCT. The patients reported continuing benefits in terms of overall improvement in their condition [χ² = 24.481, df = 4, P < 0.001, df, degrees of freedom.]

### Table 1
Baseline demographic and clinical characteristics by group

<table>
<thead>
<tr>
<th></th>
<th>Multiconvergent therapy (n = 17)</th>
<th>Relaxation (n = 14)</th>
<th>Control (n = 9)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gender, male</td>
<td>29%</td>
<td>29%</td>
<td>33%</td>
</tr>
<tr>
<td>Married</td>
<td>59</td>
<td>71</td>
<td>56</td>
</tr>
<tr>
<td>Age (SD)</td>
<td>48 (8.03)</td>
<td>45 (12.56)</td>
<td>46 (11.04)</td>
</tr>
<tr>
<td>Diagnosed by a GP</td>
<td>56%</td>
<td>50%</td>
<td>67%</td>
</tr>
<tr>
<td>Length of illness (months), mean (SD)</td>
<td>80 (48.43)</td>
<td>105 (73.1)</td>
<td>114 (51.1)</td>
</tr>
<tr>
<td>Depression scoresa (SD)</td>
<td>20.47 (10.4)</td>
<td>20.43 (7.3)</td>
<td>16.44 (13.5)</td>
</tr>
</tbody>
</table>

SD, standard deviation; GP, general practitioner.

### Table 2
Patient- and consultant-rated Karnofsky performance scores at initial clinic assessment (baseline)

<table>
<thead>
<tr>
<th>Karnofsky scores—number per cell</th>
<th>40%</th>
<th>50%</th>
<th>60%</th>
<th>70%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Patient-rated</td>
<td>1</td>
<td>3</td>
<td>10</td>
<td>21</td>
</tr>
<tr>
<td>Consultant-rated</td>
<td>0</td>
<td>0</td>
<td>8</td>
<td>27</td>
</tr>
</tbody>
</table>

### Table 3
Attainment of satisfactory outcome for performance scores (Karnofsky score of 80% or more) and improvement in performance of 10% or more at 6-month follow-up (patient- and consultant-rated)

<table>
<thead>
<tr>
<th></th>
<th>Multiconvergent therapy, % (n)</th>
<th>Relaxation, % (n)</th>
<th>Control, % (n)</th>
<th>χ², df, P-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Patient-rated</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>80% attainment</td>
<td>67 (8)</td>
<td>21 (3)</td>
<td>11 (1)</td>
<td>8.757, 2, P = 0.013</td>
</tr>
<tr>
<td>10% improvement</td>
<td>83 (10)</td>
<td>50 (7)</td>
<td>11 (1)</td>
<td>10.758, 2, P = 0.005</td>
</tr>
<tr>
<td>Consultant-rated</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>80% attainment</td>
<td>83 (10)</td>
<td>21 (3)</td>
<td>0 (0)</td>
<td>17.77, 2, P &lt; 0.001</td>
</tr>
<tr>
<td>10% improvement</td>
<td>83 (10)</td>
<td>36 (5)</td>
<td>44 (4)</td>
<td>6.377, 2, P = 0.041</td>
</tr>
</tbody>
</table>

df, degrees of freedom.
Fig. 1. Overall improvement in patients’ condition post-therapy and at 6-month follow-up. ‘Very much better’ and ‘much better’ scores recoded into a single variable and expressed as a percentage. MCT, multiconvergent therapy.

MCT = 100%, relaxation = 43%, control = 0%), lower levels of fatigue ($\chi^2 = 22.910$, df = 4, $P < 0.001$, MCT = 67%, relaxation = 43%, control = 11%), and feeling far less impaired by their illness ($\chi^2 = 10.571$, df = 4, $P = 0.032$, MCT = 83%, relaxation = 50%, control = 22%) than both the relaxation and control groups.

The lack of significant effects in the ‘usefulness’ and ‘satisfaction’ categories reflects the positive experience of patients during both MCT and relaxation therapy.

Fig. 2. Patient fatigue rating post-therapy and at 6-month follow-up. ‘Much better’ and ‘better’ scores recoded as a single variable and expressed as a percentage. MCT, multiconvergent therapy.

Adverse effects

Previous studies revealed no documented adverse effects for cognitive behaviour therapy, graded exercise therapy (pacing) or relaxation therapy, and none were indicated by any of the participants in this study.

Fig. 3. Disability rating post-therapy and at 6-month follow-up. ‘Much better’ and ‘better’ scores are recoded as a single variable and expressed as a percentage. MCT, multiconvergent therapy.

Discussion

The purpose of this study was to assess the efficacy of MCT in outpatients presenting with CFS who were under the supervision of a physiotherapist. CFS, although relatively uncommon, is a persistent, debilitating illness that has a profound effect on sufferers and their families. It was the increasing problem that this type of functional somatic syndrome was presenting to the medical profession which prompted the development of the management protocol discussed in the current study. MCT was developed by a chartered physiotherapist to address illnesses where the cause was unknown and treatment was unsuccessful. The therapy combines cognitive behaviour therapy and graded exercise in a holistic approach to illness management.

Findings from previous studies indicate that these two therapies were the most consistently successful forms of treatment for CFS. The rationale behind their success was that research had suggested that CFS patients appeared to be suffering from the effects of physical deconditioning [8], and cognitive, behavioural and sleep problems together with psychosocial factors seemed to be the mechanism responsible for perpetuating the illness [7,8].

Indeed, both cognitive behaviour therapy and graded exercise therapy had previously been evaluated separately and in combination. Therefore, an important consideration for the
current study was the compatibility of the findings with those from previous studies. To this end, the outcome measures from two previously documented randomised controlled trials of cognitive behaviour therapy were included [10,19]. Similarly, CFS patients attending relaxation therapy were used as a comparison group. However, as relaxation therapy had already been used successfully in the management of CFS by patient groups, a group of non-intervention controls was recruited for further comparison.

Patients were recruited to the study by a CFS specialist who had diagnosed their condition. All patients met the CDC criteria for CFS [1] and their performance status was below 70% on the Karnofsky scale, indicating significant functional impairment. The Karnofsky score was subsequently used as a primary outcome measure. The success of the therapy was measured by the attainment of a performance score of 80% or more and/or an improvement in functioning above 10% at 6-month follow-up [19]. These data were recorded by the physician who remained blind to treatment assignment.

Data collected at the initial clinic assessment indicated no significant difference in the level of physician- and patient-rated functional performance. The patients, however, were more likely to select the lower elements of the scale to describe their impairment (i.e. greater functional impairment). Previous research, however, has indicated that patients with CFS do perceive their functional impairment to a greater extent than might actually be the case [33]. In the current study, there was no statistically significant difference between the physician and patient ratings of function; therefore, these data should not prove problematic. It would, however, be interesting to observe any changes in the ratings of impairment over time within the patient group.

In the current study, the Karnofsky score was used as a primary outcome measure. The success of the therapy was measured by the attainment of a performance score of 80% or more and/or an improvement in functioning above 10% at 6-month follow-up [19]. These data were recorded by the physician who remained blind to treatment assignment.

Data collected by the patients indicated that there was no significant difference between the functional performance ratings for the three groups when comparing ratings immediately post-therapy with baseline measures. However, the secondary outcome measures employed [10] did indicate a significant improvement in overall condition, lower levels of fatigue and lower levels of disability in the MCT patients compared with the relaxation and control groups. These data indicate that although there was an improvement within the MCT group, patients had not interpreted it as a significant improvement in functioning.

By 6-month follow-up, however, the patients receiving MCT reported significantly higher scores on the performance scale than the relaxation and control groups. In addition, the MCT patients continued to report improvement in their overall condition, levels of fatigue and disability. Significant improvement beyond cessation of therapy is indicated here. When assessing acceptability, participants in the two treatment groups (namely MCT and relaxation therapy) commented that they were satisfied with the treatment offered and found it useful. These data further underline the positive effects of relaxation therapy reported by CFS patient groups.

The primary measure used to assess successful treatment outcome for the study was the consultant-rated Karnofsky scores at 6-month follow-up. The MCT group were significantly more likely to attain scores of 80% or above and were significantly more likely to show improvements in functioning of 10% or more at 6-month follow-up. Furthermore, statistical significance in the primary outcome measure seemed to be independent of demographic and baseline clinical characteristics.

Although this study provides data from a small number of CFS patients, the findings are encouraging. Time constraints, along with the imminent closure of the CFS clinic, meant that it was not possible to randomise the control sample or recruit substantially more patients, and these points are acknowledged as limitations in the study. However, the study was performed on a sample size likely to be found in a single, large general practice. Also, power calculations based on a previous study of MCT [18] suggested that even small sample sizes would demonstrate its benefits as a treatment for CFS. Therefore, the authors are cautiously confident that the MCT technique described in this paper produces measurable benefits in terms of improved functioning, and that these findings are directly comparable with other treatment studies [10,19].

Unlike previous studies, however, the authors believe that physiotherapists are best placed to implement this therapy, not only because the approach was developed by a practising therapist, but also due to the nature of the treatment. When implementing exercise regimes for CFS, it is important that the patient is guided through the treatment process carefully. Patients themselves are all too aware of periods of remission during which symptoms are less debilitating. This can lead to overexertion and can subsequently develop into several subsequent bad days for the sufferer. Forms of rehabilitation therapy must, therefore, consider the functional ability of each patient individually and address any psychosocial issues (such as emotional support and wellbeing) as they arise. In addition, therapists applying cognitive behaviour therapy and graded exercise therapy techniques for conditions such as CFS are required to adapt the approach constantly to suit the changeable nature of the illness.

With respect to the level of comorbid depression in the patient sample, recent findings have suggested that the abnormal psychopathology observed in CFS patients may not be responsible for their impaired functioning (submitted manuscript). However, it has also been shown that antidepressant therapy can assist long-term recovery in an otherwise untreated CFS patient [34], and these findings warrant further study. The use of antidepressant medication may play a role in the rehabilitation of the illness and has been employed previously. For the purpose of the current study, which was to assess the efficacy of MCT, antidepressant medication was not prescribed.

In continuing this programme of research, the authors are conducting a 3-year follow-up assessment of the study participants to evaluate the long-term effects of MCT (manuscript in preparation). Responses have been obtained from 24 of the study participants: two were no longer at the same address,
two declined to take part further and the remainder did not respond. Twelve of the 14 patient responders who either attended relaxation therapy or were part of the control group have now been offered MCT. The patients will be re-assessed immediately post-therapy and at 6-month follow-up.

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Conflicts of interest: None.

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