A Pain Management Program for Chronic Cancer-Treatment–Related Pain: A Preliminary Study

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Abstract: A large proportion of patients may develop chronic pain following cancer treatments such as surgery, radiotherapy, or chemotherapy. These patients can experience significant levels of physical and psychological morbidity. Our aim was to investigate a cognitive-behavioral pain management program (PMP) for cancer patients with chronic treatment-related pain. Thirteen patients (1 man, 12 women; mean age 52 yrs) completed the study, 9 of whom had a history of breast cancer and had received extensive medical treatment, including surgery. A combination of physical and psychological techniques were adapted from previous work in chronic benign pain and implemented by two therapists. Interventions included education, relaxation, exercise training, and goal setting. A variety of outcomes were examined to assess general fitness, psychological distress, coping success, activities of daily living, and pain report. The median number of interventions by each therapist was 10 (4 to 15). Postintervention, there was a significant trend toward improvement in many variables, including anxiety and depression ($P < .01$), fitness (walking: $P < .05$), and coping with pain ($P < .01$). This was a feasibility study and has several limitations. It appears, however, that all patients had a positive outcome. Further research is now required to assess the effectiveness of this approach.

Perspective: Results of this preliminary study are clinically relevant, as they suggest that a pain management program that uses cognitive-behavioral principles is worthy of further investigation for patients with chronic cancer-treatment–related pain.

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Key words: Oncology, pain, pain management program, rehabilitation, cognitive-behavioral therapy.

Advances in cancer diagnosis and treatment are resulting in improved patient survival, and consequently, the management of treatment-related morbidity is of increasing importance. Rehabilitation after cancer is an important aspect of management and has been highlighted in a recent guidance document for England and Wales. Rehabilitation requires a comprehensive approach, utilizing a skilled multidisciplinary team, and should place emphasis on maintaining function and quality of life in individuals with cancer.

Pain associated with cancer is an important problem and affects many patients and also their families. Chronic cancer-treatment–related pain (CCTRP) is a complex phenomenon that is becoming increasingly recognized. Reports on chronic pain problems associated with breast cancer appear to be most prevalent in this field of study, with many studies investigating pain problems secondary to both surgery and radiotherapy.

Traditionally, the mainstay of cancer pain management is predominately biomedical and uses pharmacological, medical, or surgical interventions. Evidence for a biopsychosocial model of cancer treatment–related pain has also been presented, and there is some support for the role of psychological and social variables in predicting cancer treatment–related pain. When considering CCTRP, it is important to recognize that although not the result of a disease process, and thus more comparable with benign pain, it occurs within the context of a cancer diagnosis and forms part of the disease trajectory. Clinical experience within a pain clinic in a specialist on-
cology center has highlighted some important features of CCTRP—the key aspects of which we address here.

**Meaning of the pain:** This can affect the intensity and distress associated with the experience. Patients may feel angry, believing their pain was an unnecessary result of treatment. Clinical experience suggests that anger can be associated with a lack of information before treatment on potential pain and/or functional problems.

Cancer patients often fear a recurrence of their disease, and the presence of a chronic treatment-related pain can act as a constant reminder of their cancer history. The meaning of changes in pain can, therefore, be extremely frightening for cancer patients.

**Sense of control:** The combined effect of a cancer diagnosis and a chronic pain condition can result in patients experiencing a loss of control. Treatments aimed at empowering patients (ie, encouraging them to regain control and be actively involved in treatment) appear to be effective, but more research is needed.

**Communication:** Patients with cancer are often reluctant to disclose their concerns about treatment. This may be exacerbated by poor communication by medical personnel. A combination of poor communication skills by healthcare professionals and lack of disclosure by cancer patients may lead to confusion, misconceptions, and heightened anxiety in many patients.

The comorbidity of psychological and physical health problems in chronic illness is well documented, and it is now widely acknowledged that the management of chronic pain requires approaches that address all aspects of the pain experience, such as the sensory, affective, and cognitive dimensions. There is a vast amount of literature examining biopsychosocial approaches, including cognitive-behavioral interventions, in chronic benign pain. There is also a growing body of evidence to suggest that physical or psychological treatments appear effective for cancer pain.

To the authors’ knowledge, none specifically address CCTRP.

The purpose of this study was to investigate the feasibility of a pain management program for patients with CCTRP. The programme aimed to reduce the disability and distress caused by chronic pain by teaching the patients physical, psychological, and practical techniques to improve their quality of life. We viewed quality of life as what the individual determined it to be, namely, “The individual's perception of their position...in relation to their goals, expectations, standards and concerns.” We aimed to focus our interventions using a client-centered approach.

**Methods**

The study had the approval of the Royal Marsden NHS Trust and Institute for Cancer Research Committee for Clinical Research and Research Ethics Committee, and all patients gave informed consent for participation.

**Study Design**

This was a pretest-posttest study design and was developed as a feasibility study. The program was based on already existing pain management programs (PMPs), many of which were developed from guidelines published by The Pain Society. An information pack produced to assist in the development of PMPs was modified. This pack included notes for healthcare professionals on the main components of PMPs, plus useful drafts of patient handouts on key topics such as pain theory, pacing of activity, and exercise programs. Guidelines on exercise prescription for the study were established from clinical experience, discussion with professional colleagues, and from the literature.

**Sample**

Patients were recruited from the Pain Clinic of the Royal Marsden Hospital (RMH) in London. As this was a feasibility study, formal sample-size calculations were not attempted. It was estimated that 15 patients would allow a 95% chance of detecting anomalies in methods that had a frequency of 25% or more (R. A’Hern, statistician, written communication, September 1999). Inclusion criteria were:

- Chronic cancer-related pain of at least 6 months duration (note: no minimum level of pain was required)
- History of cancer or being investigated for cancer
- Under the care of an RMH consultant
- Evidence of interference with activities of daily living because of pain (from subjective assessment in Pain Clinic)
- Aged >18 years

Exclusion criteria were:

- Evidence of being investigated for progressive disease
- Active psychosis (confirmed by psychiatrist/psychologist)
- Primary drug abuse
- Inadequate comprehension of English

**Procedure**

Patients were assessed in the pain clinic by two of the authors (K.R., J.W.). Potential patients were given an information sheet that provided a comprehensive outline of the trial and were informed that a more detailed assessment with both K.R. and V.D. was necessary before recruitment could be confirmed. At this stage, patients were encouraged to discuss their expectations, and we explained what would be expected of them during the trial.

**Physical (K.R.) and Psychological (V.D.) Assessments**

These took place soon as possible after the initial appointment and aimed to confirm patient suitability for the trial. Both clinicians collated information from the clinic assessment, medical notes, and their own assessments to establish a complete history of the pain problem(s). Patients were asked to complete a 1-week pain diary to provide information about pain levels and other variables such as emotions and cognitions. The clinicians
discussed each patient in detail, and suitable patients were offered a place on the trial. Patients were advised at this stage not to embark on any new therapies or treatments while participating in the trial. Written consent was obtained using the standard RMH consent form.

Outcome Measures
The main outcome measures were collected on the first appointment with the patient and were repeated at the end of treatment.
- Three tests of fitness, all previously validated for use with chronic pain patients: a 5-minute walk test (distance walked in 5 minutes), sit-to-stand test (number of repetitions in 1 minute) and arm endurance test (arm outstretched at 90° abduction and small movements, endurance in minutes).
- Range of movement: flexion and abduction of the affected shoulder measured with a goniometer.
- Hospital Anxiety and Depression (HAD) scale: a 14-item scale to measure anxiety and depression with proven reliability and validity.
- Pain Coping Inventory (PCI): a 92-item multiple choice questionnaire with good face validity and relevance in chronic pain patients.
- Brief Pain Status Questionnaire (BPSQ): this was adapted to use items 1-7 only (out of 25), to avoid duplication of information.
- Pain report: Numerical rating scale (0-10) used for worst, least, and average pain.

Goal-Setting
Both clinicians worked closely with the patients to formulate problems into goals of treatment, which were agreed upon and documented. Treatment goals and plans of treatment were adaptable and constantly changing with the therapeutic process.

Treatment
Certain modifications were necessary to adapt the PMP for a cancer population.
- Individual sessions: patients were not seen in groups as this was a feasibility study, necessitating testing of techniques on individuals before embarking on groups. Furthermore, individual sessions allowed tailoring of treatment to individual need.
- Emphasis on reporting new pains: due to the threat of disease progression, patients were encouraged to report new pains.
- Close liaison with oncology teams: although medical attention is not normally encouraged in PMPs, patients were encouraged to keep in close contact with their oncologist.

Wherever possible, both therapists treated the patients on the same day. Sessions were approximately 60 minutes long and took place once a week, decreasing to once every 2 weeks or once a month based on patient progress and clinical opinion. The therapists gained ideas for content through discussion between themselves, liaison with colleagues, expert opinion, and review of the literature. All teaching was interactive and used the patients’ own experiences to make learning personalized and relevant. Both therapists worked closely to ensure they were both working towards joint goals. Treatment was provided over a course of 3 to 6 months. It was impossible to fully standardize the components of the sessions, as they were in response to patient needs and tailored to current problems. There were, however, key components, and these are presented in Table 1. The following is an example of the intervention with one patient.

Clinical Example
‘X’ was a 58-year-old woman who lived with her partner and had given up work due to pain. All of her cancer treatments were carried out at the local district hospital. ‘X’ was very distressed by the treatments she had received and was referred to RMH in January 2000 for an opinion on her future care.

Medical history: wide local excision of left breast with axillary node dissection (October 1996); postoperative radiotherapy and tamoxifen; left mastectomy and LD flap reconstruction with implant (May 1999) for locally recurrent disease.

Psychiatric history: major depressive disorder recognized after cancer diagnosis; dothiepin 75 mg daily since then.

Pain history: no pain prior to surgery; breast pain started during radiotherapy when she was badly burned. Constant pain until second operation; well controlled in immediate postoperative period, but then noticed a further increase in breast pain and developed pain in lateral chest wall/back.

Drug history: amitriptyline and gabapentin stopped due to side-effects; currently taking co-dydramol.

The main clinical findings and treatment plans (physiotherapist and psychologist) for ‘X’ are shown in Table 2. Consultant intervention: after assessing patients in the pain clinic, the consultant (J.W.) had a primarily supervisory role unless complications occurred. Patients had the

<table>
<thead>
<tr>
<th>Table 1. Therapy Interventions</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>PHYSIOTHERAPIST INTERVENTION</strong></td>
</tr>
<tr>
<td>----------------------------------</td>
</tr>
<tr>
<td>Goal setting</td>
</tr>
<tr>
<td>Pain theory</td>
</tr>
<tr>
<td>Overactivity/underactivity cycle and pacing</td>
</tr>
<tr>
<td>Introduction to exercise:</td>
</tr>
<tr>
<td>- explanation of the different components of fitness and how fitness can be improved</td>
</tr>
<tr>
<td>Posture, moving and handling</td>
</tr>
<tr>
<td>Relapse and prevention</td>
</tr>
<tr>
<td>Summary session</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>PHYSIOTHERAPIST INTERVENTION</strong></th>
<th><strong>PSYCHOLOGIST INTERVENTION</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>Goal setting</td>
<td>Goal setting</td>
</tr>
<tr>
<td>Pain theory</td>
<td>Role of the many factors involved in pain</td>
</tr>
<tr>
<td>Overactivity/underactivity cycle and pacing</td>
<td>Homework assignments: self-monitoring of factors (eg, negative thoughts and practice of coping skills)</td>
</tr>
<tr>
<td>Introduction to exercise:</td>
<td>Relaxation techniques: primarily diaphragmatic breathing techniques and progressive muscle relaxation</td>
</tr>
<tr>
<td>- explanation of the different components of fitness and how fitness can be improved</td>
<td></td>
</tr>
<tr>
<td>Posture, moving and handling</td>
<td>Cognitive relaxation</td>
</tr>
<tr>
<td>Relapse and prevention</td>
<td>Summary session</td>
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<tr>
<td>Summary session</td>
<td>Summary session</td>
</tr>
</tbody>
</table>
Table 2. Therapy Interventions With Patient ‘X’

<table>
<thead>
<tr>
<th>MAIN CLINICAL FINDINGS</th>
<th>TREATMENT PLAN</th>
</tr>
</thead>
<tbody>
<tr>
<td>Complete lack of understanding of the causes of her pain, confusion over explanations and advice given to her</td>
<td>Explanation of her reconstructive surgery, the side-effects of radiation, and the theory of chronic pain</td>
</tr>
<tr>
<td>General physical deconditioning secondary to depression, avoidance behavior, and underactivity</td>
<td>Introduction of an exercise regime with walking and pacing of activities previously enjoyed (eg, line dancing)</td>
</tr>
<tr>
<td>Decreased functional use of her left arm secondary to avoidance behaviour and underactivity</td>
<td>Graded exercise program, including stretches and strengthening exercises for left arm; pacing of domestic chores</td>
</tr>
<tr>
<td>Altered posture secondary to pain and muscle spasm</td>
<td>Postural advice and correction of muscle imbalance; advice on relaxation</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>PSYCHOLOGIST</th>
<th>PSYCHOLOGIST</th>
</tr>
</thead>
<tbody>
<tr>
<td>Strong feeling of frustration as a result of the way her pain had been managed and of the limitations pain imposed on her</td>
<td>Exploration and ventilation of her frustration</td>
</tr>
<tr>
<td>Clinical depression reducing self-esteem and self-confidence, limiting daily and social activities, and reinforcing physical deconditioning</td>
<td>Introduction of goal setting and activity scheduling, identification of primary emotions and cognitive restructuring of underlying beliefs about her care and her pain</td>
</tr>
<tr>
<td>Avoidance behavior as a result of her pain and depression: daily tasks and activities, meeting people, driving her car, asking clarifications of medical information</td>
<td>Explanation of how these patterns contribute to maintaining her pain; graded self-exposure</td>
</tr>
<tr>
<td>Use of analgesics as her only strategy to cope with the pain</td>
<td>Teaching of deep breathing relaxation, visualization techniques, and use of distraction activities</td>
</tr>
</tbody>
</table>

Results

Eighteen patients met the inclusion criteria, but 5 dropped out before commencing the study for the following reasons:

- Two felt better and in no need of further intervention after the structured interview with the psychologist.
- One was more suitable for primary psychiatric treatment.
- One required medical investigation for cardiovascular disease.
- One did not agree with the treatment goals.

The 13 patients (12 women) had a mean age of 52 years (range 38-60 yrs). The mean duration of pain was 39 months (range 7-120 months). The oncology diagnosis was mainly breast cancer (9 women). The other diagnoses were sarcoma (n = 1), oesophageal cancer (male, n = 1), renal cell carcinoma (n = 1) and benign breast disease (n = 1). For a complete description of the sample, see Table 3.

Baseline Measures

A summary of the baseline measures is shown in Table 4. To summarize, subjects were a highly anxious population; 10 subjects scored >11 (above normal for anxiety), with varying levels of depression (5 subjects scored >11 for depression). Pain reports were often severe. All patients demonstrated a lifestyle consisting of overactivity or underactivity, depending on their pain levels. Two clinical pictures appeared to emerge:

1. Predominately overactive patients with high levels of anxiety and a fear of reducing activities, lest it make them more disabled (n = 6)
2. Predominately underactive, depressed patients with a fear of increasing activity, lest it make their pain worse (n = 7).

The majority had low levels of physical fitness and suffered profound disability in many aspects of daily living. Coping strategies, when used, were mostly maladaptive and ineffectual, such as stopping all activities, dependence on caregiver/family, or habitual participation in activities known to exacerbate pain.

Amount of Treatment

The median number of treatment interventions by each therapist was 10 (range 4-15). No relationship was found between the duration of pain and the amount of treatment by either physiotherapist (R = .21, P = .48) or psychologist (R = .33, P = .27). No relationship was found between the number of treatments and the change in variables.

Pretest/Posttest Comparisons

Results are considered in 6 main sections in an attempt to highlight clinically relevant themes. The data are presented in Table 4.

General fitness (includes the 3 tests of fitness and range of movement). Significant improvements (P <
range .001-.05) were found in all aspects of fitness, apart from arm endurance. The greatest improvements were seen in the sit-to-stand test.

Psychological distress (includes HAD Scale; Nociceptive Index, Psychological Maladjustment Severity Index and Pain Alienation Index, from Pain Coping Inventory). Significant improvements were seen in the anxiety (P < .01) and depression (P < .01) scores and in the Nociception Index (P < .05). There were no significant changes found in either the Psychological Maladaptive Severity Index or the Pain Alienation Index.

Coping success (includes Pain Coping Index and Psychological Coping Index). Significant increases in coping were demonstrated by 2 indices from the Pain Coping Inventory (P < .01 and P < .05).

Activities of daily living (ADL) (includes Behavioral Interference Severity Index from PCI and overall disability, household chores impairment, and work impairment from BPSQ). Significant decreases (P < range .01-.05) were found for all of these variables representative of activities of daily living (ie, data show an improvement in status.

Pain report (includes worst, least and average pain from NRS, present pain from BPSQ, and Physical Severity Index from PCI). Significant decreases were found in present (P < .01), worst (P < .01), and average pain (P < .007) scores and the Physical Severity Index (P < .01). There was no significant change in least pain scores.

**Analgesic Requirements**

Medication use was generally low and is not shown in Table 4. Patients expressed a preference for nondrug management to avoid potential side effects. Medication use was monitored throughout the trial, and comparisons between baseline medication use and requirements posttreatment were made. Five patients (38%) showed a decrease in analgesic requirements, 6 patients (46%) had the same requirements, and 2 patients (16%) used different analgesics, and, therefore, their data could not be analyzed.

**Discussion**

The results were encouraging in that there was a consistent trend, often statistically significant, suggesting improvements in many of the variables measured. Our

### Table 3. Descriptive Data for the Subjects

<table>
<thead>
<tr>
<th>NO.</th>
<th>AGE (YRS)</th>
<th>DIAGNOSIS</th>
<th>CANCER TREATMENT</th>
<th>PROPOSED CAUSE OF PAIN</th>
<th>DURATION (MOS)</th>
<th>MEDICATION</th>
<th>OTHER PAINS</th>
<th>WORKING</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>60</td>
<td>Breast cancer</td>
<td>WLE + AND, Radio, Chemo, Tamoxifen</td>
<td>Surgery</td>
<td>13</td>
<td>Ibuprofen and paracetamol bd</td>
<td>None</td>
<td>Retired</td>
</tr>
<tr>
<td>2</td>
<td>47</td>
<td>Breast cancer, lymphoedema</td>
<td>Mast + LD flap, Chemo, Tamoxifen</td>
<td>Surgery</td>
<td>12</td>
<td>Tramadol 50 mg tds, amitriptyline 75 mg</td>
<td>None</td>
<td>Y</td>
</tr>
<tr>
<td>3</td>
<td>58</td>
<td>Breast cancer</td>
<td>WLE + AND, Radio, Chemo, Mast + LD flap + implant, Radio, Chemo</td>
<td>Surgery</td>
<td>42</td>
<td>Gabapentin 300 mg tds</td>
<td>None</td>
<td>N</td>
</tr>
<tr>
<td>4</td>
<td>58</td>
<td>Breast cancer, osteoarthritis</td>
<td>Mast + LD flap + implant, Radio, Chemo</td>
<td>Surgery</td>
<td>13</td>
<td>MST 30 mg bd, Sevredol 10 mg prn, Paracetamol</td>
<td>Low back/ternal pain</td>
<td>N</td>
</tr>
<tr>
<td>5</td>
<td>46</td>
<td>Breast cancer, lymphoedema</td>
<td>Lumpectomy, Radio, Chemo</td>
<td>Surgery and surgery and lymphoedema</td>
<td>7</td>
<td>Paracetamol prn</td>
<td>None</td>
<td>N</td>
</tr>
<tr>
<td>6</td>
<td>59</td>
<td>Breast cancer, lymphoedema</td>
<td>Mastectomy, Radio, Chemo</td>
<td>Surgery and surgery and Radio</td>
<td>37</td>
<td>Paracetamol tds</td>
<td>Low back/neck pain</td>
<td>N</td>
</tr>
<tr>
<td>7</td>
<td>57</td>
<td>Breast cancer, lymphoedema, osteoporosis</td>
<td>WLE + AND, Radio, Tamoxifen</td>
<td>Surgery</td>
<td>72</td>
<td>Paracetamol prn</td>
<td>None</td>
<td>N</td>
</tr>
<tr>
<td>8</td>
<td>50</td>
<td>Breast cancer</td>
<td>WLE + AND, Radio, Chemo, Tamoxifen</td>
<td>Surgery</td>
<td>60</td>
<td>Co-dydramol (10/500) prn</td>
<td>None</td>
<td>N</td>
</tr>
<tr>
<td>9</td>
<td>38</td>
<td>Breast cancer</td>
<td>Mast + AND + LD flap, Chemo, Radio</td>
<td>Surgery</td>
<td>9</td>
<td>Amitriptyline 15 mg</td>
<td>Low back pain</td>
<td>N</td>
</tr>
<tr>
<td>10</td>
<td>50</td>
<td>Renal cell carcinoma</td>
<td>Nephrectomy</td>
<td>Surgery</td>
<td>48</td>
<td>Sevredol 10 mg tds, Gabapentin 300 mg tds</td>
<td>Nerve pains in hands and back</td>
<td>Y</td>
</tr>
<tr>
<td>11</td>
<td>56</td>
<td>Pelvic sarcoma</td>
<td>Surgical excision, Radio</td>
<td>Radio</td>
<td>120</td>
<td>Sevredol 10 mg tds, Gabapentin 300 mg tds</td>
<td>None</td>
<td>N</td>
</tr>
<tr>
<td>12</td>
<td>48</td>
<td>Benign breast disease</td>
<td>Tamoxifen, drainage of cysts</td>
<td>Breast cysts</td>
<td>60</td>
<td>None</td>
<td>Back pain</td>
<td>Y</td>
</tr>
<tr>
<td>13</td>
<td>46</td>
<td>Oesophageal cancer</td>
<td>Oesophago-gastrectomy, Chemo</td>
<td>Surgery</td>
<td>18</td>
<td>None</td>
<td>None</td>
<td>Y</td>
</tr>
</tbody>
</table>

Abbreviations: WLE, wide local excision; AND, axillary node dissection; Radio, radiotherapy; Chemo, chemotherapy; LD, latissimus dorsi; bd, twice daily; tds, three times a day; prn, as necessary.
Table 4. Summary of Pretest-Posttest Comparisons for all Variables

<table>
<thead>
<tr>
<th>VARIABLE</th>
<th>N</th>
<th>PRETEST</th>
<th>POSTTEST</th>
<th>P VALUE</th>
</tr>
</thead>
<tbody>
<tr>
<td>General fitness: 5 min walk (km)</td>
<td>13</td>
<td>0.2 (0.1 to 0.7)</td>
<td>0.4 (0.1 to 0.6)</td>
<td>&lt;.05</td>
</tr>
<tr>
<td>General fitness: sit-stand (reps)</td>
<td>13</td>
<td>13 (4 to 17)</td>
<td>20 (6 to 38)</td>
<td>&lt;.001</td>
</tr>
<tr>
<td>General fitness: left flexion (deg)</td>
<td>13</td>
<td>130 (70 to 155)</td>
<td>150 (95 to 170)</td>
<td>&lt;.05</td>
</tr>
<tr>
<td>General fitness: left abduction (deg)</td>
<td>13</td>
<td>140 (90 to 170)</td>
<td>165 (125 to 180)</td>
<td>&lt;.01</td>
</tr>
<tr>
<td>General fitness: right flexion (deg)</td>
<td>13</td>
<td>145 (70 to 180)</td>
<td>155 (80 to 180)</td>
<td>&lt;.05</td>
</tr>
<tr>
<td>General fitness: right abduction (deg)</td>
<td>13</td>
<td>160 (75 to 180)</td>
<td>170 (105 to 180)</td>
<td>&lt;.05</td>
</tr>
<tr>
<td>General fitness: arm endurance (s)</td>
<td>13</td>
<td>58 (20 to 115)</td>
<td>65 (33 to 127)</td>
<td>NS</td>
</tr>
<tr>
<td>Psychological distress: anxiety*</td>
<td>13</td>
<td>12 (2 to 17)</td>
<td>10 (2 to 13)</td>
<td>&lt;.01</td>
</tr>
<tr>
<td>Psychological distress: depression*</td>
<td>13</td>
<td>8 (5 to 16)</td>
<td>6 (1 to 12)</td>
<td>&lt;.01</td>
</tr>
<tr>
<td>Psychological distress: nociception Index†</td>
<td>13</td>
<td>122 (85 to 161)</td>
<td>93 (57 to 132)</td>
<td>&lt;.05</td>
</tr>
<tr>
<td>Psychological distress: Psy Mal Sev Index†</td>
<td>13</td>
<td>129 (56 to 146)</td>
<td>89 (62 to 140)</td>
<td>NS</td>
</tr>
<tr>
<td>Psychological distress: Pain Alien Index†</td>
<td>13</td>
<td>117 (46 to 146)</td>
<td>81 (53 to 152)</td>
<td>NS</td>
</tr>
<tr>
<td>Coping success: Pain Coping Index†</td>
<td>13</td>
<td>118 (89 to 153)</td>
<td>147 (108 to 172)</td>
<td>&lt;.01</td>
</tr>
<tr>
<td>Coping success: Psy Coping Index†</td>
<td>13</td>
<td>113 (84 to 137)</td>
<td>137 (93 to 158)</td>
<td>&lt;.01</td>
</tr>
<tr>
<td>ADL: Behavioral Interf Severity Index†</td>
<td>13</td>
<td>64 (42 to 96)</td>
<td>56 (33 to 73)</td>
<td>&lt;.05</td>
</tr>
<tr>
<td>ADL: overall disability‡</td>
<td>13</td>
<td>80 (50 to 90)</td>
<td>35 (0 to 80)</td>
<td>&lt;.01</td>
</tr>
<tr>
<td>ADL: household chores impairment‡</td>
<td>13</td>
<td>60 (30 to 90)</td>
<td>50 (0 to 80)</td>
<td>&lt;.01</td>
</tr>
<tr>
<td>ADL: work impairment‡</td>
<td>13</td>
<td>75 (10 to 90)</td>
<td>40 (0 to 90)</td>
<td>&lt;.01</td>
</tr>
<tr>
<td>Pain report: present pain‡</td>
<td>13</td>
<td>6 (3 to 10)</td>
<td>4 (0 to 8)</td>
<td>&lt;.01</td>
</tr>
<tr>
<td>Pain report: worst pain§</td>
<td>13</td>
<td>9 (7 to 10)</td>
<td>7 (2 to 9)</td>
<td>&lt;.01</td>
</tr>
<tr>
<td>Pain report: least pain§</td>
<td>13</td>
<td>3 (0 to 9)</td>
<td>1 (0 to 5)</td>
<td>NS</td>
</tr>
<tr>
<td>Pain report: average pain§</td>
<td>13</td>
<td>5 (4 to 9)</td>
<td>4 (1 to 7)</td>
<td>&lt;.007</td>
</tr>
<tr>
<td>Pain report: Physical Severity Index†</td>
<td>13</td>
<td>46 (31 to 54)</td>
<td>37 (18 to 50)</td>
<td>&lt;.01</td>
</tr>
</tbody>
</table>

Abbreviation: NS, not significant.

NOTE. Pretest and posttest data, along with Wilcoxin P values, are shown for all the variables. Significant improvements (P < .05) are found in 19/23 variables, representing a mixture of physical and psychological measures.

*HAD scale.
†PCI.
‡BPSQ.
§Numerical rating scale.

Outcome measures appeared to show similar trends toward improvement, which is not surprising as relationships between physical limitations and psychological distress are well recognized in this field. Complex causal relationships may exist but are beyond the scope of this paper. There did not appear to be any relationship between the amount of treatment given and the outcomes produced, but this warrants further study. These subjects appeared to be similar to those participating in, and benefitting from, other PMPs. The important difference in this study was the fear of recurrent cancer. This is important when considering clinical interventions, as some evidence suggests that pain attributed to cancer (as opposed to a more benign cause) is likely to be rated higher.33 This concurs with other research in which emotional distress has consistently been shown to be a strong indicator of pain severity.41 These factors made management of patients in this study particularly difficult, as they exhibited the complexities of chronic pain with the problems and survivorship issues linked with a cancer diagnosis.

As this was a feasibility study, the methodology was experimental but was based on the best available evidence, clinical experience, and expert opinion. Clear guidelines exist for cognitive-behavioral PMPs, and the authors followed these. Clinical experience and the literature suggest that interventions for cancer patients must be tailored to individual needs. These patients were seen individually, with education, information, and treatment provided on an “as needed” basis. Further work is required to refine the assessment of these patients and to ascertain their needs; including the role of other healthcare professionals, such as occupational therapists and nurses. The improvements in general fitness and activities of daily living were particularly important from a clinical point of view. Alongside the improvements seen in the global impact of pain, they indicate an improvement in physical functioning and suggest that patients were more able to participate in domestic, work-related, and other activities without difficulty. It is well known that physical deconditioning is an important sequela of chronic pain, and is unlikely to resolve without effective intervention.48 The use of exercise in this PMP appeared to be effective in reversing the effects of deconditioning, and the use of graded exercise programs is recommended in future research. Return to work was not examined in this study and may be a focus for future work.

The results for psychological distress are equally encouraging. The improvements in anxiety and in coping suggest that patients were less worried about their pain and felt more in control of its management. Anxiety levels may have dropped with commencement of treatment...
as patients felt supported and cared for, which is commonly seen in clinical practice. Managing the feelings of helplessness and lack of control is essential in these patients because both are linked to depression.4 Nonetheless, a comprehensive assessment of all pain experience and men may have more difficulty with more likely to examine the psychosocial aspects of their illnesses when planning pain treatments, as women appear professionals also need to be aware of gender differences when considering these results to note that our sample is not representative of the cancer population as a whole. Our sample was small and primarily female, and the majority were diagnosed with breast cancer. Further research is needed in a larger sample of patients with a variety of cancer diagnoses. Healthcare professionals also need to be aware of gender differences when planning pain treatments, as women appear more likely to examine the psychosocial aspects of their pain experience and men may have more difficulty with this.4 Nonetheless, a comprehensive assessment of all factors must be utilized for both sexes.4

Conclusions

This study is timely, as survivorship and quality of life issues in breast cancer are now of paramount importance. The management of patients experiencing CCTRP requires a thorough understanding, not only of chronic pain and its management, but of cancer and its treatment, and of the wider issues—notably, the individual cancer “journey” as experienced by the patient.

This was a feasibility study that was neither randomized nor controlled; therefore, changes in condition cannot be solely attributed to interventions. It appears, however, that patients in this study had a positive outcome. It is unlikely that our outcomes were due to natural improvement in condition, as many patients had experienced pain for a number of years. We restricted other treatment as able, but suggest that as we improved patients’ self-efficacy, they may have utilized other coping strategies independently of this trial. Future research should use a rigorous RCT design with sufficient patient numbers and should include long-term follow-up. Evaluation of outcome is an essential component of healthcare delivery,29 and best available evidence from well-conducted research studies will help guide patients toward the most effective treatments. To the authors’ knowledge, there is currently no guidance available on what constitutes clinically significant improvements in patients with chronic pain related to cancer treatment. Where research evidence is absent, we must look toward systematic and comprehensive assessment using outcome measures that are reliable and valid for cancer patients and that are closely linked to both the aims of treatment and the patients’ main goals. Self-report measures are extensively used, and with certain measures such as the HAD Scale, clinical significance is more easily established because scores are rated as within normal or abnormal range. Much work needs to be done to improve our understanding in this area.

We suggest that healthcare professionals involved in the care of cancer patients with CCTRP consider the use of non-pharmacologic interventions in their work. The importance of evidence-based practice necessitates close links between clinicians and researchers in this field. Clinicians within specialist oncology centers are ideally placed to conduct such investigations, despite the pressures of clinical caseloads within such environments. The increasing number of academic institutions providing postgraduate courses in oncology may result in increased opportunities for research in this field.

Acknowledgments

We thank Mr. Roger A’Hern and Ms. Caoimhe O’Sullivan for their excellent support with statistical analysis.

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