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Research Report

Patient Perspectives on Participation in Cognitive Functional Therapy for Chronic Low Back Pain: A Qualitative Study

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Abstract:

Background: Cognitive Functional Therapy has been shown to reduce pain and disability in people with chronic low back pain.

Objectives: To investigate participants' experience of Cognitive Functional Therapy by comparing those who reported larger or smaller improvements with treatment, potentially yielding insight into the implementation of this approach.

Design: Non-interventional, cross-sectional study with an Interpretive Description framework.

Methods: Individuals who had participated in Cognitive Functional Therapy in two physiotherapy settings (in Ireland and Australia) were recruited through purposive sampling based on disability outcomes post intervention (n=9), and theoretical sampling (n=5). This sampling strategy was used to capture a range of participant experiences, but was not used to define the final qualitative groupings. Semi-structured interviews were conducted 3-6 months post intervention.

Results: Three groups emerged from the qualitative analysis; Large Improvers, Small Improvers and Unchanged. Two themes encapsulated the pivotal steps: (i) Changing Pain Beliefs and (ii) Achieving Independence. Changing pain beliefs to a more biopsychosocial perspective required a strong therapeutic alliance, development of body awareness and the experience of control over pain. Those who were Unchanged retained their biomedical beliefs. Independence was achieved by Large Improvers through newly cultivated problem solving skills, self-efficacy, decreased fear of pain and improved stress coping. Residual fear and poor stress coping meant Small Improvers were easily distressed and lacked independence. Those who were Unchanged continued to feel defined by their pain and retained a biomedical perspective.

Conclusion: A successful outcome after Cognitive Functional Therapy is dependent on instilling biopsychosocial pain beliefs and developing independence among participants. Small Improvers may require ongoing support to maintain results. Further study is required to elucidate the optimal approach for those who were Unchanged.

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Introduction

Chronic low back pain (CLBP) is a common condition which frequently causes considerable distress and disability.¹ Many common interventions for CLBP, based on the premise that structural or anatomical dysfunction underlies the pain experience, have failed to consistently produce significant long-term improvements in terms of pain or function.²⁻⁵ However, a wide range of biological, psychosocial, behavioural and lifestyle factors are now known to interact in a self-perpetuating cycle in the evolution and persistence of CLBP.⁶⁻¹¹

Cognitive Functional Therapy (CFT) is a comprehensive biopsychosocial approach which aims to address the mechanisms driving CLBP and associated disability.¹² It's focus is on reconceptualising pain as a biopsychosocial problem, functionally retraining maladaptive and feared postures and movement patterns and addressing contributing lifestyle factors.¹² CFT retains an emphasis on physical rehabilitation similar to many traditional exercise-based rehabilitation approaches to the treatment of CLBP. However CFT also incorporates other recent innovations in pain management including (i) how thoughts can affect actions similar to cognitive behavioural therapy, (ii) a strong focus on education about pain neurophysiology, (iii) the use of mindfulness and (iv) the potential harm associated with trying to “fight” pain, similar to acceptance and commitment therapy¹³. This approach provides statistically and clinically significant improvements in disability, pain and a variety of cognitive and psychosocial variables among patients with CLBP.^{12, 14} Further detail on the components of the CFT intervention has recently been published in a recent article in this journal.¹² However, while quantitative methodologies are essential to elucidate the efficacy of this approach,

they cannot give an account of the context, interactions, interpretations and experiences which are integral to the treatment process.^{15, 16} Qualitative methodologies allow these intricacies to be explored and used, both to guide research and the implementation of interventions such as CFT.

The perspectives of individuals undergoing biopsychosocially orientated interventions for chronic pain are beginning to be investigated.¹⁷⁻¹⁹ These studies yielded insight both into the practical elements and cognitive shifts required for successful intervention. These included the formation of a supportive and motivating bond with the therapist, provision of accessible education, pain redefinition, fear deconstruction, and the restoration of hope and an acceptable sense of self.¹⁷⁻¹⁹ The knowledge generated may be useful in treatment planning and execution. However, these interventions varied in content from CFT and were not outlined in detail. Secondary quantitative outcome measures in the aforementioned CFT studies^{12, 14} suggest that the meaning of CLBP, the perceived danger of physical activity, self-efficacy, mood, anxiety and catastrophising change over the course of CFT treatment. However, further qualitative research is warranted in order to establish how these reported quantitative changes after CFT overlap with the qualitative insights reported above from other research on CLBP.

The aim of this study was to compare and contrast the perspectives of participants who reported differing levels of improvement after CFT. The objectives were to elucidate the key requirements in achieving a successful outcome with CFT and provide a comprehensive and practical insight for clinicians wishing to implement this approach in a patient-centred and effective manner.

Methods

Design

Non-interventional, cross-sectional qualitative study

Methodology

Interpretive description (ID) was the methodology by which inquiry was guided.²⁰ This is a paradigm developed specifically to guide health care orientated research, conducted by researchers who are necessarily knowledgeable in the field of investigation.²⁰ The aim of ID is to create credible, rigorous and valid knowledge, which elucidates shared realities, while maintaining an appreciation for the individual nature of health and illness experiences.²¹ Ultimately, results should contribute to a framework by which assessment, planning or interventions may be guided.²¹ This was deemed appropriate for the research aims and objectives as outlined above.

Researchers:

All authors are physiotherapists with clinical and research interests in the biopsychosocial management of CLBP.

Participants

Cognitive Functional Therapy:

All participants had undergone CFT for CLBP with experienced musculoskeletal physiotherapists, two of whom were co-authors (KOS and POS). Details of this

intervention can be found elsewhere.¹² The treatment was individualised to the patient and consisted of four components.

1. Pain Education: Focused on reconceptualising pain within a biopsychosocial context related to the individuals' story.
2. Specific posture/movement re-training: Graduated retraining and graded exposure to previously pain provocative tasks in a relaxed, confident, mindful manner.
3. Functional integration: Incorporating learned functional behaviours into daily tasks.
4. Physical activity and lifestyle training: Increasing physical activity levels in a relaxed, confident, mindful manner while developing skills to enhance sleep and stress coping.

All aspects of the intervention were underpinned by a strong therapeutic alliance, with an emphasis on open and motivational communication style.

Sampling:

Individuals who had participated in a CFT intervention in two settings, one in Ireland and one in Australia, were eligible for participation. These two settings were chosen for convenience to the authors and to capture a wide diversity in experience of the CFT intervention. Three to six months after the intervention, nine individuals from the Irish setting were sampled purposively to ensure a sample with an even representation of sex (male/female), and a range of disability outcomes post-intervention ($\geq 30\%$ reduction on Oswestry Disability Index at three months post intervention) (Table 1). Purposive

sampling based on disability aimed to capture a range of experiences of CFT. Disability scores were only used to recruit a sample of improvers and non-improvers, not to define the groupings described in the qualitative analysis. Indeed, the researchers who performed the interviews and conducted the data analysis were blinded to the treatment outcome status of each participant when they were recruited for participation.

Semi-structured interviews were conducted initially with these nine participants. To test emerging concepts from analysis of these nine interviews, five additional individuals who had undergone CFT treatment with diverse outcomes were recruited from the Australian setting. The Australian participants were not recruited based on Oswestry scores post intervention, but rather, on levels of pain-related fear as measured by the Tampa Scale of Kinesiophobia (TSK) in order to assist in our understanding of the emerging theme 'Changing Pain Beliefs'. These individuals were taking part in a concurrent study being conducted by two of the co-authors exploring changes in pain-related fear in people with CLBP and high pain-related fear undergoing a range of interventions for CLBP as part of their usual care. A full description of the study can be found at Bunzli et al²². Two individuals who were recruited experienced improvements in pain-related fear so that they no longer met the criteria for high fear following CFT. Three individuals who were recruited, reported improvements in pain-related fear following CFT, but still met the criteria for high fear.

Recruitment stopped once we had sufficient data to provide practical insight for clinicians wishing to implement CFT. All individuals in Australia who were invited agreed to participate, while 14 participants in Ireland were contacted in order to recruit

the nine that were interviewed. Of the five (three male, three with changes >30% on Oswestry Disability Index) Irish participants who refused to participate, two could not attend for logistical reasons, one was ill, and two did not reply to telephone messages. All participants signed informed consent to participate and have their interviews recorded.

Data Collection:

One-to-one, face-to-face interviews were conducted by one author in each setting (SMc and SB). The interviewers were not previously known to the participants and were unaware of their disability outcomes prior to the interview. Semi-structured interviews opened with questioning about the context of the persons' life, the circumstances of their CLBP, the impact it had on their lives and previous interventions they had received before the CFT intervention. Subsequent questions included those concerning the CFT intervention itself. This included their expectations, initial reaction and evolving opinion of treatment. The knowledge they had gained and their physical and emotional journey through treatment was explored. Finally, their current understanding and coping strategies, along with their hopes and expectations for the future were outlined. An outline of the interview schedule is provided in Appendix 1. Either party were free to diverge where other relevant topics emerged, in order to retain the inductive approach.²³ The interviews were conducted in either a University room designated for qualitative research or in the participants' home, and lasted between 20 minutes and one hour. All interviews were recorded by dictaphone and transcribed verbatim.

Data Analysis

Data collection and data analysis occurred concurrently. The earliest stages of analysis involved repetitive reading of the transcripts in order to gain a broad sense of the data in context.²¹ Two separate authors (SB and SMc) independently analysed each transcript. The first question asked of the data was: ‘did this individual experience an improvement in their pain experience through CFT?’ Codes were identified inductively from the raw data, rather than deductively from pre-existing theory. This was done by asking broad questions such as ‘what is going on here?’.²¹ Two authors (SB and SMc) independently performed initial coding and resultant code lists were then compared. This was undertaken to reassure that interpretations were justifiable and grounded in the raw data, rather than a priori beliefs. Whilst some variation in terms existed between the two coders, the meaning of the codes were consistent. Through a process of constant comparative analysis, (cycling between the code book and raw data) and discussion between authors, a comprehensive code book (Figure 1a) was compiled that was able to describe all raw data. Once all interviews had been completed, each transcript was re-coded with the comprehensive code book.

During the coding of each transcript, the participants’ experiences were initially interpreted by two separate authors as reflecting an improved pain experience (Improvers) or not (Unchanged). Improvers were defined as individuals who described having experienced an improvement in physical and psycho-social functioning post CFT intervention. Scores on quantitative outcome measures were not used for determining improver status; the interpretations remained grounded in the individual participants’ experiences. However, it became clear during this process that not all participants could be easily described as Improvers or Unchanged. For example, two

participants reported a positive response to some aspects of the intervention (altered pain beliefs) but a poor response to others (they described limited pain self-efficacy). As such, the “Improvers” category was further divided into “Large Improvers” and “Small Improvers” by the researchers. This was felt to be reflective of reality, defined as “complex, contextual, constructed and ultimately subjective” by Thorne et al.²¹ The two authors were consistent in their identification of Large Improvers, Small Improvers, and Unchanged based on their independent analysis of interview transcripts. Transcripts were thereafter grouped by Improver status. Patterns of experiences were identified across-group and then compared within-group. Codes occurring in more than two thirds of a group were termed ‘key codes’. These were used to give a sense of the defining characteristics of each group.

Coded data was inserted into a computer assisted software (Codesort) purpose designed by one author (SB), to sort the extracts by code. The software produced a pdf document with hyperlinks between three levels of context: (i) The original transcript where coded extracts were highlighted; (ii) The extracts grouped by code; and (iii) A graphical representation (code plot) of all the codes appearing in each transcript. The pdf could be shared between authors and assisted in the identification of emerging patterns. Through repetitive interpretation, synthesising and theorising, these codes were grouped into common themes which were considered by all authors to be representative of the participants experiences.²¹

The interpretations presented represent the authors’ attempts to inform clinical physiotherapy practice, however alternative interpretations of the participants’

experiences are possible, as with any qualitative investigation. Through offering a “believable, confident representation of the participants experiences, supported by meaningful data and well-qualified themes”²⁴ the findings described in this study yield insights to inform clinical practice.

Results

Participants

The demographic details of the participants are displayed in Table 1. The final sample was 57% female, with a mean of 42 years of age and a mean LBP duration of nine years. Six of the 14 participants were working full time at the time of the study.

Main Findings

In analysing the narratives of participants, the codes that appeared important in achieving an optimal outcome were grouped into two themes: (i) Changing Pain Beliefs and (ii) Achieving Independence. Each of these themes then contained several different codes. Changing beliefs included the codes therapeutic alliance, body awareness and pain control. Achieving independence included the codes problem solving, self-efficacy, fear, stress coping and normality.

The specific codes which were noted for each participant are presented in Appendix 2, though it is important to highlight that Appendix 2 indicates the frequency but not the salience of these codes for each participant. In Figure 1a the code plot containing the full list of codes in the code book is presented. Figures 1b and 1c are code plots which illustrate the experiences of two participants coded as Large Improvers and two that

were coded as Unchanged. A 'branch' of the code plot is present when the corresponding code appears in the individuals' transcript. In figure 1b the dominance of negative codes on the right such as 'low self-efficacy' and 'inability to problem solve' can be seen. In figure 1c the dominance of positive codes on the left such as 'accept explanatory model' and 'high self-efficacy' can be seen. Nevertheless, it is acknowledged that even in both of these example figures, some contradictory information can be seen among both groups. For example, participant 9 (Unchanged) reported enhanced body awareness, and some ability to control pain whilst simultaneously reporting difficulties controlling pain, strong biomedical beliefs and an interference of pain in activities of daily living.

A description of the themes identified is provided below, with supporting extracts labeled by participant code, improver status (Large Improvers = LI, Small Improvers = SI and Unchanged = U) and the line number where the extract occurred in the interview transcript.

Theme One: Changing Pain Beliefs

In general participants entered the intervention with strong biomedical beliefs regarding the cause of their pain. Acceptance of a biopsychosocial model for their pain differentiated the Large Improvers and Small Improvers from the Unchanged. All Large Improvers demonstrated biopsychosocial beliefs post intervention. Though the Large Improvers still acknowledged their biomedical diagnoses, these appeared to be part of their pain history and no longer caused them distress:

“There can be pain without being physical or structural problems..... when there is something going on in someone’s life you know it can manifest in any in any area..... there is more to it than just the structure.” [P11, LI, line 600]

While Small Improvers also described their current pain predominantly in biopsychosocial terms, they found the idea of an underlying sinister cause more difficult to relinquish:

“When you're in pain, it's still very hard to let go of that (the concept of disc herniation) at times, and that will be a constant battle I think.” [P 5, SI line 135]

Though all participants in the Unchanged group indicated that they understood the biopsychosocial concepts, they did not appear to attribute these concepts to their pain experience, and remained in search of a biomedical explanation:

"I don't know, I'm still, baffled over it... any scans like, they just show it was only muscle... but I myself think that there is more there... “[P 9, U, line 172]

Therapeutic Alliance

Therapeutic alliance appeared to play a role in challenging pre-existing beliefs. The establishment of a trusting relationship with the therapist appeared important in facilitating effective communication in which individuals felt comfortable airing their concerns and doubts, with the underlying faith that the therapist had their best interests at heart:

"I found myself questioning it a couple of times..... But I think that you just have to have that communication, that comfortable atmosphere has to be there" [P 1, LI, line 196- 205]

"I think knowing that you have someone that cares about your condition is great" [P 11, LI, line 592]

On the contrary, those who were Unchanged appeared less likely to describe a strong relationship with the therapist than Large Improvers:

"The other physio kind of laughed at me sometimes... he was like oh your pain is silly don't worry about it just relax and I was like I can't really do that." [P 12, U, line 74]

However interestingly, the Small Improvers also reported a strong therapeutic alliance suggesting that the establishment of a trusting relationship and open communication may have set the scene for improvement, but alone may not be enough to bring about large improvements in the pain experience:

"He was great, and it made it very easy, you know, it wasn't like a doctor patient thing, and I didn't feel ever, at any time, that I was a nuisance. Sometimes I would feel that I was going on and on, and he was very easy going, and very relaxed..... like I would get worked up, and he would just calm it down, he had a very good way of being able to do that [P 5, SI, line 207]

Body Awareness

Large and Small Improvers described how the therapist assisted them to gain a new perspective of the self both physically and mentally. This new 'body awareness' was crucial in providing a rationale for their pain, and increasing their faith in the new explanatory model:

"I realised how stiff I moved.....holding your breath, moaning as you did something.... totally unknownst to myself" [P 2, LI, line 105]

"When you're stuck in things you can't see clearly, and you need someone to guide you, "[P 5, SI, line 232]

While some who were Unchanged reported an improved awareness of how they moved, they appeared not to be empowered by this experience as the Large Improvers were. Instead they continued to search for a biomedical explanation for their pain:

"It helped me 'so' much... but, there is something else, you could say, that is causing it, the whole thing to come back..." [P 9, U, line 189]

Experiencing Pain Control

Armed with new information and improved body awareness, Large Improvers and Small Improvers could experience control over their pain. Both Large Improvers and Small Improvers cited the experience of control over pain as the key to the consolidation of their new belief system:

“I think you build up confidence in your body when the worst happens and then you get through it.” [P 13, LI, line 270]

“if you feel like you can cope with the pain, or you feel you have a way of relieving it , it doesn't make it half as bad....I started back work again, and before I couldn't bake at the table longer than a couple of hours, whereas now I'm doing 24 hours straight... [P 2, LI, line 141]

On the contrary, those who were Unchanged did not experience significant control over pain, which had the effect of confirming their doubts:

“If I was going away, long distance, I don't know if I could manage it... I try and relax, but it seems, twenty minutes, half an hour at the most, I'd be crippled... ”
[P 9, U, line 89]

Theme Two: Achieving Independence

The second pivotal step was achieving independence, graduating from the support of one-to-one therapy to self-management.

Problem Solving and Self-Efficacy

Independent self-management was built on the foundation of sound problem-solving skills. Large Improvers felt that they now understood their pain, and because they had previously achieved control, they did not doubt their capacity to deal with further pain experiences:

"like I think you kind of got that knowledge, of what was really happening within yourself... and by that like, I mean, if I got a pain again, which I have done, on and off, that I'm able to check myselfand see can I unravel it myself" [P 1, LI, line 110]

The high pain self-efficacy described by Large Improvers contrasted with the low pain-self efficacy described by Small Improvers who appeared to have residual concerns about their ability to cope with a relapse:

"I had to go back and ring X again, I tried to manage for I'd say, maybe a month... and I wasn't winning, and my thinking got negative again, and so I had to ask for help..." [P 5, SI, line 163]

Since those who were Unchanged did not believe they had found the cause of their pain, they felt unable to problem solve new episodes:

"For a while there I was so sore and this was about 3 months ago... and I was like why am I so sore I don't understand" [P 14, U, line 57]

Fear

Due to an understanding of the cause of their pain, and greater confidence in their ability to control it, Large Improvers reported less fear in the face of new pain episodes:

"I wasn't as scared that it was going to last forever, and that that was the end of my activities like, you know?" [P 3, LI, line 84]

In contrast, both Small Improvers and those who were Unchanged reported fear in the face of new pain experiences. This Small Improver believed she could slip back into a cycle of fear if her pain returned:

"At the moment, if it stays away I am not panicking. But if it got worse now, if the stress thing went and the pain was still there ... ?" [P 7, SI, Line 344]

Whilst this individual in the Unchanged group remained fearful of performing movements that increased pain intensity:

"It hurts and I am scared I am going to hurt it more" [P 10, U, line 011]

Stress Coping

Not only was it important that participants learned the effect of stress and lifestyle on the experience of pain, it was imperative that they learned how to deal with these stressors, in order to achieve lasting control over pain. Large Improvers acknowledged these stressors as contributors to their pain experience, and found active coping mechanisms to reduce their impact:

"I mean I was in agony those couple of days, but it wasn't until I came back to the basics that I got my whole body to relax. For me anyway, it was stemming from an emotional incident that tensed up the whole back" [P 2, LI, line 246]

While Small Improvers found it difficult to manage stressors, they at least acknowledged their presence compared to the Unchanged group who did not appear to link stress events with new episodes of LBP at all:

"Stress causes a lot of it and I'm still not good with managing stress, I still need help with that, and that comes from all angles in my life" [P 5, SI, line 84]

"Well it's more of a physical thing with me than a mental thing really" [P 8, U, line 115]

Normality

The concept of becoming "normal" again recurred frequently. Confident in their ability to control pain, Large Improvers were no longer defined by their LBP and they returned to normal activities with renewed optimism for the future:

"I'm back to work three days a week, in a different job now, fair enough... I do my three miles every day...I'm back playing the golf now... the gardening... and I'm back coaching the soccer again... so I'm back living almost a normal life again..." [P 1, LI, line 116]

While the Small Improvers were satisfied that they were coping better than previously and had achieved many of their goals, their pain relapses seemed to remind them that they were not ‘normal’ and consequently they adjusted their expectations for the future:

“I did so well at the start of the course, I thought maybe I can be normal again... now I don’t think that I’ll ever be fully normal again, but a lot better than what I was... so you know I’m pretty pleased with what I have” [P 5, SI, line 184]

Finally, the Unchanged retained a feeling of abnormality where they felt defined by their LBP, had limited participation in everyday life, and were uncertain as to their future prognosis:

“The thing is I can’t see the end of tunnel anymore... I have tried the rehab it hasn’t worked. What next?” [P 10, U, line 367]

Discussion:

Summary of Findings

The results suggest that improvement after a CFT intervention depends on the degree to which patients 1. Adopt biopsychosocial beliefs, and 2. Their ability to independently self-manage their condition. Changing beliefs was associated with a strong therapeutic alliance, development of body awareness and the experience of pain control. Achieving independence was associated with the development of problem solving skills and self-efficacy, reducing fear, improving stress coping and a return to normality.

Theme one: Changing pain beliefs

Attaining a working biopsychosocial understanding of the individual experience of CLBP appeared to be critical in achieving an optimal outcome. Changing pain beliefs accounts for a large proportion of the improvements in physical disability, depressive symptoms, and pain intensity post intervention.²⁵ Participants in this study held strong biomedical pain beliefs before the CFT intervention, in line with the belief patterns of the wider CLBP population.²⁶ After CFT treatment, Large Improvers were confident in their understanding of the diverse physical, psychological and social factors which could contribute to their pain. In contrast, the Unchanged continued to adhere to biomedical beliefs. The experiences of Small Improvers served to outline the importance, not only of a logical understanding of the multifaceted nature of pain, but a deep visceral confidence in new beliefs. These findings suggest that changing participant beliefs should be a priority for treatment. These results concur with those reported by Toye and Barker¹⁷ who found the acceptance of a biopsychosocial explanation of pain to be necessary for restoring hope and achieving a successful outcome. Similarly Coutu et al.²⁷ have suggested that transforming beliefs about LBP is an important step for injured workers on the return to work pathway. A novel aspect of this study is in exploring the learning process which cultivates these new beliefs and understandings, which patients may struggle with.^{28, 29} The codes which emerged as key to changing beliefs were; therapeutic alliance, enhanced body awareness and experiencing control over pain.

A strong therapeutic alliance has been found to predict positive outcomes in CLBP interventions.³⁰ The findings suggest that an open, trusting, non-judgemental

relationship enhanced compliance in the early stages of therapy, creating an atmosphere in which participants felt comfortable in challenging the explanations provided by the therapist. This questioning and discussion helped to reconcile misgivings and clarify understandings, thus facilitating the acceptance of new explanatory models. Matthias et al.¹⁹ similarly found that ‘brainstorming’ and mutual discussion with the care provider (a nurse) was pivotal in facilitating patient learning and helps drive an effective learning process.³¹ In this study, the Unchanged described a more complex patient-therapist relationship. Issues such as the polarity of their beliefs and the extent to which they were aware of these differences, their readiness for change and the quality of the communication between patient and therapist affected their alliance and impeded their successful progression through the intervention. However, while a strong therapeutic alliance seemed to be a necessary prerequisite to successful rehabilitation, it should be noted that this was not always sufficient, as some Small Improvers also reported a strong therapeutic alliance yet did not achieve as successful an outcome. This may reflect the lack of independence among the Small Improvers group, despite changed beliefs.

Enhancing body awareness involves the practical application of new beliefs, such that participants gained a new perspective on their movement patterns, muscle tension, thought processes, lifestyle and external stressors and how these influenced their pain. For Large Improvers and Small Improvers, this new perspective improved their perceived control over pain. It provided them with a firm rationale for, and trust in, strategies such as relaxation, adaptive movement patterns and changes to lifestyle and external stressors. To the Unchanged, who continued to search for an underlying

anatomical pain driver, these strategies were insufficient. Providing people with pain control strategies may be critically important, since a lack of such strategies has been linked to the maintenance of high pain-related fear²² and to feelings of despair.³² Improved body awareness facilitated independent problem solving, a core skill for self-management. Participants described developing these skills through guided reflective problem solving^{33, 34} in which they applied their new knowledge to explain previous painful episodes, suggesting these skills may be useful in achieving independent self-management.

Experiencing control over pain using new reasoning and behaviours was cited by most Large Improvers as key to the full integration of biopsychosocial beliefs. Experiencing control over pain provided indisputable proof of self-efficacy whilst a lack of experience confirmed their doubts and increased the risk of abandonment of new beliefs. Experience has long been accepted as the cornerstone of learning, providing validation and subjective meaning to abstract concepts.³⁵ The experience of control is known to be a predictor of decreased disability in future pain episodes.³⁶ A previous qualitative study exploring patient experiences of an exercise intervention for CLBP found that the intervention failed to increase participants' perception of control over pain, who instead appeared to attribute any improvement to the presence of the physiotherapist³⁷. This contrasts with the descriptions provided by Improvers in this study, in which the CFT therapist appeared to successfully reassure them that any experiences of control were attributed to the participants' own reasoning and actions rather than those of the therapist. Thus, in addition to cementing new beliefs, control over pain appeared to provide the bridge to the second phase, achieving independence.

Theme two: Achieving Independence

Achieving independence was defined as the ability to carry over the positive results of CFT to independently self-manage new pain episodes, and to translate new learned behaviours into meaningful activity. The key codes linked to this process were; strong self-efficacy, decreased fear and improved stress coping. These allowed Large Improvers to return to 'normality', breaking the chronic pain and disability cycle. Self-efficacy is the confidence in one's ability to achieve a desired outcome.³⁸ Self-efficacy may mediate the link between pain intensity and CLBP disability, with higher self-efficacy correlating with lower levels of disability.^{39, 40} Large Improvers felt confident in their own ability to manage their pain. This improved self-efficacy reduced distress caused by the pain relapses, and was reinforced by their independent mastery of the same. This was in contrast to those who were Unchanged who, while benefiting in part from treatment, neither understood their pain nor experienced the ability to control it. Therefore, the Unchanged group continued to seek biomedical treatment.

The divide between Large Improvers and Small Improvers was most apparent in their experiences post treatment. Residual fears of a sinister pathology and a difficulty in coping with external stressors contributed to the inconsistent self-efficacy of Small Improvers. These participants appreciated the behaviours required in achieving control, but had difficulty implementing them. Primary amongst these was the management of stress and anxiety. Stress and anxiety are associated with increased pain intensity and disability, and prevent participation in active coping strategies.^{7, 41, 42} Ongoing stress and anxiety appear to have interacted to render Small Improvers less able to

independently manage pain relapses. This in turn, reinforced anxieties about an underlying sinister pathology. Becoming independent therefore requires not only the provision of self-management strategies, but positive experiences which may be attributed to them.^{7, 43} Regardless of positive experiences within treatment, independent experiences of self-management appeared to be central to achieving autonomy.

Return to normality and restoration of self

The cumulative effects of CFT treatment allowed Large Improvers to return to meaningful activity, in contrast to the Unchanged who continued to describe avoidance behaviour. Small Improvers returned to function, but their experiences were inconsistent. Activities such as work, exercise, fulfilling family roles and socialising are known to be important, not only to prevent pain related deconditioning⁴⁴ but to improve mood, distress and frustration.²⁶ Negative affective states such as these are known to adversely impact on pain and disability⁷. Therefore, participation in meaningful activity may be crucial in maintaining the benefits gained from treatment. The importance of returning to meaningful activity and re-establishing an acceptable self-definition is emphasised by Matthias et al¹⁸ who found that the realisation that activities could be enjoyed in spite of pain was a valued result of treatment. Consistent with our findings, Toye and Barker¹⁷ found that the reconstruction of an acceptable self-identity was the final contributor to the restoration of hope in Large Improvers, who gradually returned to meaningful activities, unlike the Unchanged, who could not reconcile short term pacing with long term gains. Ensuring patients have the confidence and ability to return to meaningful activity through treatment appears essential in order to ensure the maintenance of results achieved through treatment.

Design considerations

The classification of one participant, P11, requires further consideration. P11 was classified as a Large Improver by both of the co-authors who independently conducted data analysis. However, as seen in Appendix 2, whilst the majority of codes in the interview transcript of P11 were positive, a considerable number of negative codes were also present in the transcript. Unlike the Small Responders and Non-responders in this study, for each negative code in the transcript of P11, an opposite positive code was present, such as inability to problem solve and ability to problem solve. To illustrate using these codes, P11 described a rare situation where they found it difficult to problem solve and also described consistently being able to effectively problem solve on a daily basis. This example highlights the difference between the occurrence of a code and the meaning extracted from the whole.

The authors acknowledge the expert lens through which this study was conducted, as consistent with the Interpretive Description framework. The interpretations presented represent the authors' attempts to inform clinical physiotherapy practice, however alternative interpretations of the participants' experiences are possible, as with any qualitative investigation. Through offering a "believable, confident representation of the participants experiences, supported by meaningful data and well-qualified themes"²⁴ the findings described in this study yield insights to inform clinical practice.

Two of the researchers (KOS and POS) delivered the CFT intervention to the participants in this study. Whilst two other researchers (SB and SMc), independent to

the intervention and unknown to the participants invited them to participate and conducted the interviews, participants were aware that their clinicians were involved in this study. Therefore it is possible that social desirability forces may have resulted in an inflation of positive responses. To limit any bias from the treating clinicians during the process of data analysis, SB and SMC performed all data coding with input from KOS and POS only during the interpretive stages.

A key limitation of the study design is that interviews were conducted at a single point in time and therefore we were reliant on memory recall that may be influenced by mood states and pain levels. Future qualitative studies in this area would benefit from repeated interviews (such as baseline, during and completion) to explore how temporal fluctuations in the pain experience may impact on the participants' perceptions of CFT. A longer follow-up period may also be useful to understand if and how improvements in the LBP experience due to CFT may be sustained over time.

Another limitation of this study is the lack of disability data for the Australian participants. In contrast to the Irish participants, the Australian participants were all employed, with only one on sick leave, suggesting that they may have been a less disabled subgroup. However, we reiterate that the Australian sample was included to test emerging concepts related to improvement status following participation in CFT and therefore a lower disability status is unlikely to have influenced the study findings.

It is acknowledged that the sample size for this study was small. The division of the improver category meant that the small improver 'group' comprised of only two

individuals. However the finding that some individuals may experience a positive response to some aspects of the CFT intervention but not to others, highlights the value of qualitative research in understanding responses to treatment that may not be reflected in the effect sizes of large randomized controlled trials.

Clinical Insights

The age, gender, disability and LBP duration of this sample is representative of the wider population of people participating in CFT for CLBP^{12, 14}. Therefore the insights gained from the experiences described by this sample may be considered transferable to the clinical setting.

The findings emphasise the role of the physiotherapist as a mentor in equipping patients with the knowledge and independent problem solving skills required for self-management. Patients do not passively acquire the above skills, but are involved in an active and challenging mode of therapy. Participants valued being actively engaged in the clinical reasoning process. Therapists needed to challenge old beliefs, encourage discussion and resolve cognitive dissonance, but to do this in a motivational, empathetic manner. Learning based on personal experience and meaningful activities, which demonstrated how their bodies moved and reacted, was appreciated. Effective progression to independent self-management required strong problem solving skills to cope with new pain experiences and confidence in returning to meaningful activities. The pre-discharge identification of patients who appear uncertain in their own capabilities, or whom are at risk of long term stress or anxiety, may highlight those who will struggle with independent self-management. The role of the therapist in these

situations may include raising awareness of their impact on the pain experience, onward referral for multidisciplinary care and the maintenance of contact and follow up as required to optimise function.

Future research

The results need to be replicated in future prospective studies involving larger samples. To investigate the potential mediating role of the two central themes from these findings, future RCTs might consider including quantitative measures such as the Back Beliefs Questionnaire⁴⁵, the Pain Self-Efficacy Questionnaire⁴⁶, the Tampa Scale of Kinesiophobia⁴⁷ and the Working Alliance Inventory⁴⁸ at intervals throughout the trial period.

Conclusion

The results of this study suggest that the outcomes of those who participate in a CFT intervention diverge according to the degree to which patients adopt biopsychosocial beliefs, and are able to achieve independent self-management. Successful progression appears to be dictated by the quality of the patient-therapist alliance, establishment of body awareness and the experience of control over pain, evolving self-efficacy, decreased fear, improved stress coping and returning to 'normality'. These insights may be valuable in guiding the optimal implementation of CFT.

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Table 1: Participant characteristics

Figure 1a,b,c

Title: Code Plots: A visual representation of the sorted data produced by Codesort

Figure 1a: Complete list of codes used in the coding of raw data

Figure 1b: Codes used in the coding of 2 sample 'Unchanged'

Figure 1c: Codes used in the coding of 2 sample 'Large Improvers'

Appendix 1: Semi-structured interview guide

Appendix 2: Codes which were noted for each participant in raw data.

Table 1: Participant Characteristics

Participant number	Nationality	Sex	Age (years)	Duration of CLBP (months)	Leg Pain	ODI score (change from baseline)	TSK score (change from baseline)	Employment status
Large Improvers:								
1	Irish	M	43	9	Yes	10 (-60%)	N/A	Part-time employed
2	Irish	F	40	276	No	7 (-78%)	N/A	Employed
3	Irish	F	45	120	Yes	2 (-91%)	N/A	Employed
6	Irish	M	22	36	Yes	8 (-88%)	N/A	Student (on disability benefit before treatment)
11	Australian	F	33	144	Yes	N/A	15 (-22%)	Employed

13	Australian	M	42	24	No	N/A	14 (-20%)	Employed
Unchanged								
4	Irish	M	54	40	Yes	38 (-25%)	N/A	Part-time employed (unemployed before treatment)
8	Irish	M	57	456	Yes	30 (-27%)	N/A	Part-time employed (disability scheme)
9	Irish	M	32	25	Yes	36 (-17%)	N/A	Unemployed (on disability benefit)
10	Australian	F	39	6	Yes	N/A	24 (35%)	Employed
12	Australian	F	25	6	No	N/A	0 (0%)	Employed (on

										sick leave)
14	Australian	F	61	120	No	N/A	15 (22%)	Part-time employed		
Small Improvers										
5	Irish	F	50	240	Yes	18(-43%)	N/A	Employed		
7	Irish	F	50	36	Yes	26 (-51%)	N/A	Unemployed		

CLBP – chronic low back pain; ODI - Oswestry Disability Index; TSK – Tampa Scale of Kinesiophobia; N/A - not applicable; negative value for ODI change indicates less disability after treatment; negative value for TSK change indicates less fear after treatment

Figure 1a

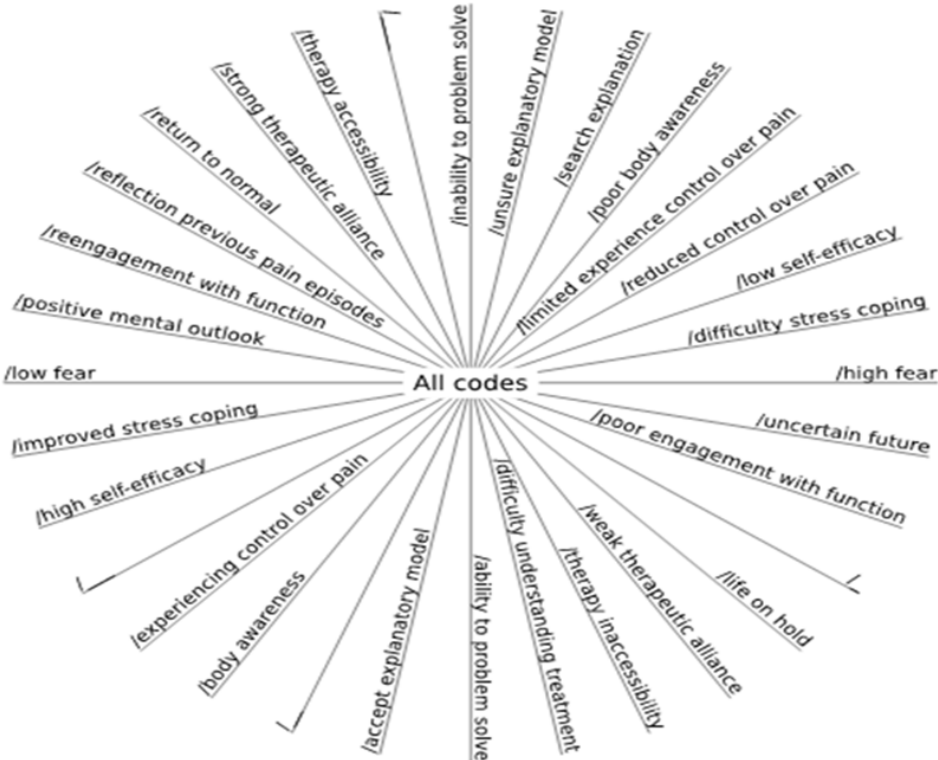


Figure 1b

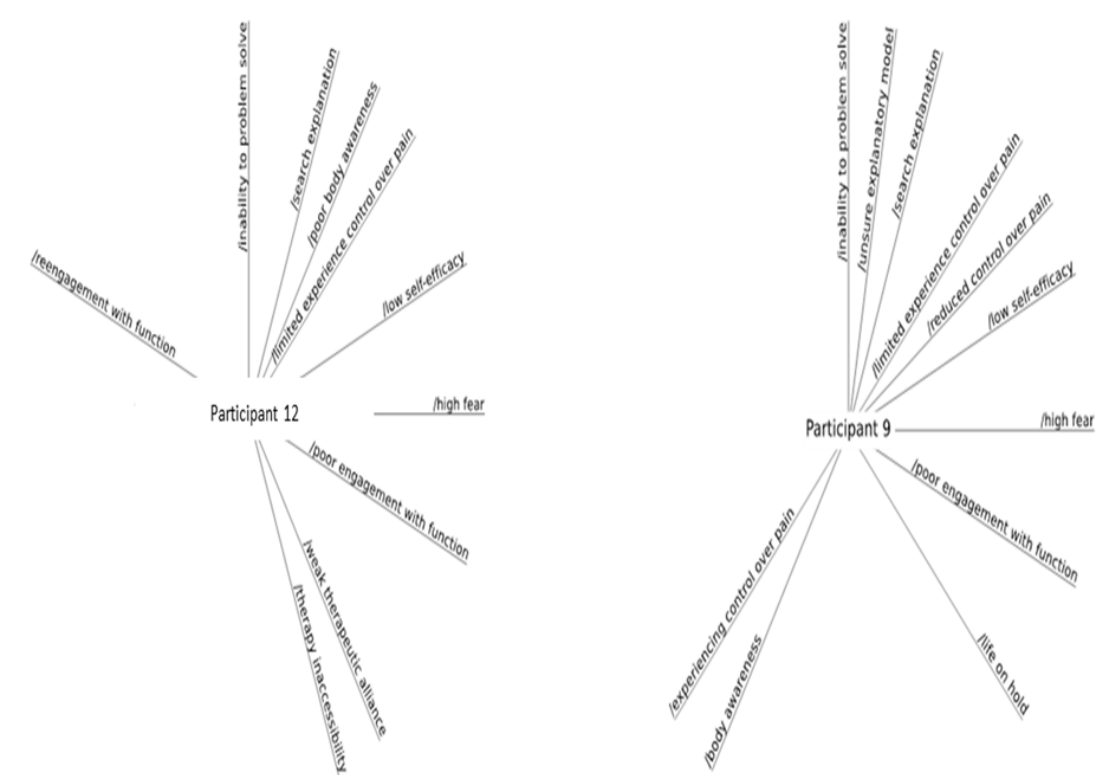
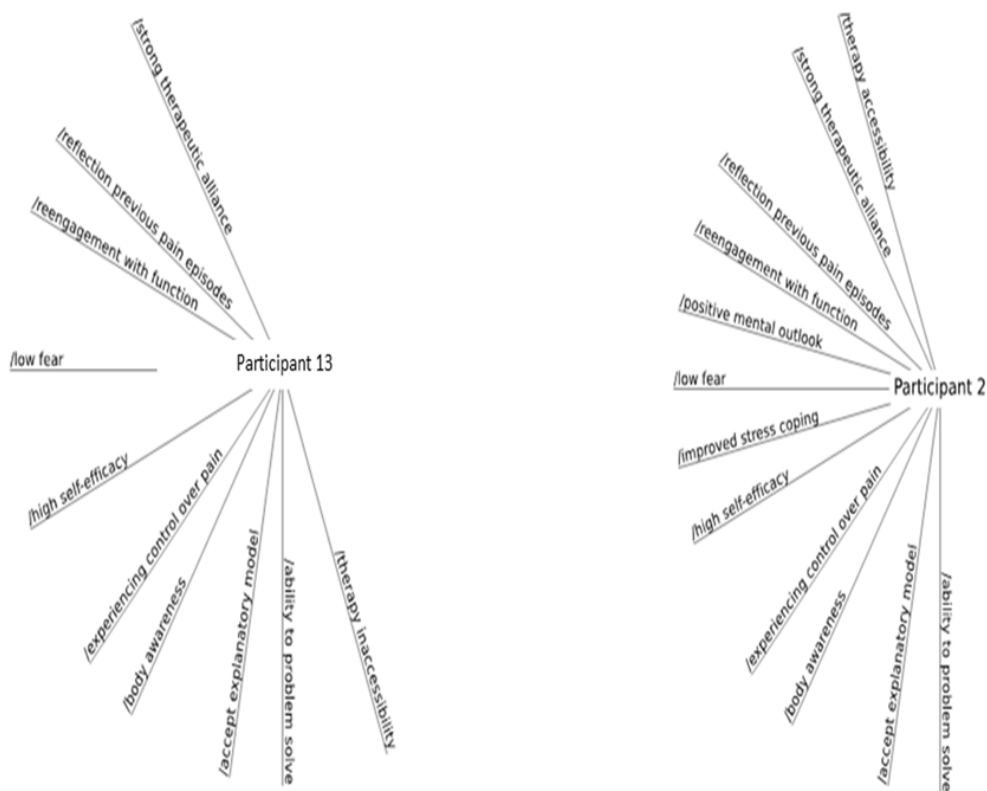


Figure 1c



Appendix 1: Example interview questions

Can you please tell me the story of your low back pain? What had you been told? How did this impact you?
What treatments had you received before treatment here? What would you have understood about the cause of your pain before you started this treatment?
Can you please describe your experience of treatment here, starting from the beginning? Prompt: expectations, facilitators/barriers to engagement, relevance, key moments
Has your pain experience changed in any way since participating in treatment here? How? Why? Prompt: Change in symptoms? Disability? Beliefs? Behaviour?
What are your expectations for the future? How confident are you that you can cope with your pain and live a normal life? Why?

Appendix 2

[illegible]

[illegible]