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**RESEARCH ARTICLE**

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# Fibromyalgia Self-Management: Mapping the behaviour change techniques used in a practice-based programme

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**Abstract**

**Background:** Fibromyalgia (FM) is a complex long-term condition associated with pain, fatigue and concentration difficulties. There is limited robust evidence for the effectiveness of pharmacological treatments for FM, with current guidelines recommending nonpharmacological interventions. The clinically developed Fibromyalgia Self-Management Programme (FSMP) is a nonpharmacological, multidisciplinary education group intervention. The FSMP aims to provide condition-specific, patient-centred education and exercise advice, supporting the development of core self-management skills. This research aimed to map the FSMP to a recommended behaviour change taxonomy (BCT).

**Methods:** Non-participatory observations of the 4- and 6-week FSMP were conducted. Detailed notes on the content of the course, therapist delivery and any additional content not included in the manual were recorded. Subsequently, semistructured interviews were conducted with both therapists ( $n = 4$ ) and patients ( $n = 9$ ). Observation and a review of the FSMP manual data were deductively coded to the BCT. Interview data were added to the framework.

**Results:** The review of the FSMP manual and observations of the course showed that the programme coded onto 12 of the 16 BCT domains, encompassing 22 behaviour change techniques. Both patient and therapist interviews indicated that patients made positive changes, including increased activity levels, pacing, better quality sleep and improved communication with family members. Patients reported improvements to symptoms as a result of attending the course.

**Conclusions:** The FSMP utilises a range of behaviour change techniques. Patients who attend the course feel supported to make changes to their behaviour, enabling them to manage their symptoms more effectively.

**KEYWORDS**

chronic pain, qualitative research, self-management

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## 1 | BACKGROUND

Fibromyalgia (FM) is a complex long-term condition associated with widespread chronic pain, fatigue, stiffness, sleep problems, cognitive dysfunction and irritable bowel syndrome (IBS) (Bennett, 2009). It is estimated that between 2.9% and 7% of the U.K. population are affected by FM (Jones et al., 2015; Weir et al., 2006) with the prevalence higher in women compared with men (Jones et al., 2015; Mas, Carmona, Valverde, & Ribas, 2008; Wolfe, Ross, Anderson, Russell, & Hebert, 1995). The true incidence of FM may, however, be much higher as challenges in diagnosis, due to shared symptomology with other conditions, make it difficult to accurately measure prevalence (Lempp, Hatch, Carville, & Choy, 2009; Macfarlane et al., 2017).

FM can cause high levels of disability with individuals making frequent use of healthcare resources and often experiencing loss of work-days or, in some more severe cases, an inability to work (Boonen et al., 2005; Hughes, Martinez, Myon, Taïeb, & Wessely, 2006). As there is no cure for FM, current treatment recommendations focus on enabling the patient to self-manage their symptoms by encouraging changes in patient lifestyle such as pacing activities, relaxation and regular exercise (Eich et al., 2012; Fitzcharles et al., 2013; Hughes et al., 2006).

Self-management interventions are characterised by having elements of self-efficacy building, self-monitoring, goal setting and action planning, decision making, problem-solving and self-tailoring and fulfil a partnership between patients and health professionals (de Silva, 2011; Du et al., 2017). The evidence supporting self-management interventions for long-term conditions is compelling with improvements shown in physical symptoms and function, participant engagement, self-efficacy, and mood and reductions in health service costs (Hurley, Walsh, Mitchell, Nicholas, & Patell, 2012; Kennedy et al., 2007; Newman, Steed, & Mulligan, 2004; Panagiotti et al., 2014; Schulman-Green, Jaser, Park, & Whittemore, 2016). Despite this, few professionally led FM management programmes exist in the United Kingdom, meaning that the majority of patients are required to travel long distances to attend or are not able to access these services.

In 2008, allied health professionals at the Royal National Hospital for Rheumatic Diseases, Royal United Hospitals Bath NHS Foundation Trust, developed a Fibromyalgia Self-Management Programme (FSMP), a nonpharmacological, multidisciplinary education group intervention. The programme is delivered via weekly sessions over 4 weeks (4 h per session) or 6 weeks (2.5 h per session) in a group setting and co-led by physiotherapists, occupational therapists, specialist nurses and dieticians. The contents of both the 6- and 4-week programmes are identical; however, as some patients with FM experience high levels of fatigue, the 6-week programme allows delivery at a more gentle pace. The main aims of the FSMP are to provide condition-specific, patient-centred education and exercise advice and to support the development of core self-management skills through patient behaviour change. The programme has received positive feedback from patients with local audit data showing increased patient self-efficacy to self-manage FM immediately after the programme and at 12 months. The programme was developed and implemented based on clinical knowledge and expertise of both patients and healthcare professionals. No formal assessment of the course

effectiveness or evaluation of the course components and delivery has been carried out. This limits the replicability of the course in other locations as well as formal evaluation.

The behaviour change taxonomy (BCT) (Michie et al., 2013) was developed to provide a common language with which to create and report complex interventions. It comprises a cross-domain, consensually agreed, hierarchically structured list of behaviour change techniques and offers a structured approach to the identification of techniques used in interventions. It contains 93 techniques clustered in 16 groups (see appendix 2). The aim of this study was to use the BCT to map the contents of the FSMP and identify the active intervention ingredients and behaviour change techniques. By identifying the targets of behavioural change, this will support a thorough evaluation of the programme and provide an evidence base for future service provision.

## 2 | METHODS

Ethical approval for this study was granted by the University of the West of England ethics review body in October 2016 (Reference HAS.16.09.021). All participants consented to take part in the group observations and qualitative interviews.

This study was conducted in three distinct phases: Phase 1—a review of the FSMP programme material; Phase 2—non-participatory observations of the FSMP programme and Phase 3—qualitative interviews with therapists and patients.

### 2.1 | Phase 1: Review of course material

The FSMP is guided by detailed patient and therapist manuals. The therapist manual provides an overview of the programme structure, a detailed breakdown of each session and instructions for group activities. The patients are given their own manual at the start of the programme, which contains background information on FM, a summary of each session, the group exercises and homework exercises.

Patient and therapist course manuals were uploaded to the qualitative software analysis package NVivo10. A coding framework of the BCT was created. The contents of both manuals were deductively coded against the framework to identify techniques present in the programme. For example, short-term goal setting in Week 1 of the 4-week programme and Week 2 of the 6-week programme was coded against Item 1.1 goal setting (behaviour).

### 2.2 | Phase 2: Non-participatory observations

Non-participatory observations were carried out of all sessions of a 4-week FSMP and a 6-week FSMP delivered between January 2017 and March 2017. Two researchers conducted the observations (KW and JP); KW attended nine of the 10 sessions, and J.P. attended one session. Both KW and JP made detailed notes on the content of the course, therapist delivery and any additional content not included

in the manual (see appendix 2). Notes were structured according to the therapist manual for each session using a proforma document with columns for the task (specified in the manual), the facilitator (e.g., physiotherapist, occupational therapist, specialist nurse and dietician) and content of the task, including delivery, patient reaction and involvement. The researcher made particular note of any variation from the manual, including additions or omissions. The notes were then imported into NVivo10 for analysis.

## 2.3 | Phase 3: Qualitative interviews

Semistructured qualitative interviews with therapists ( $n = 4$ ) and patients ( $n = 9$ ) were conducted between February 2017 and June 2017. Both the therapist and patient interviews were guided by a literature-informed topic guide and the analysis of the observation and review data. The topic guides were developed by JP and KW and reviewed by members of the research team (see Figures 1 and 2).

Two physiotherapists and two occupational therapists involved in the delivery of the FSMP were invited by e-mail to take part in qualitative interviews. All therapists invited agreed to take part. The therapist interviews explored views of the course, areas that facilitated behaviour change, what they thought was working well or not so well and suggestions for improvement. Three of the four interviews were conducted face to face at the Royal National Hospital for Rheumatic Diseases, and the fourth interview was conducted by telephone. Therapist interviews lasted between 41 and 52 min (mean 47 min).

A purposive sample of patients who had recently attended the programme were invited to take part in an interview about their experiences. Patients were sampled upon key characteristics including age, gender, delivery of the FSMP (4- or 6-week programme) and FSMP

### Patient - Topic guide

#### *Intervention mapping of a Fibromyalgia Self-Sanagement Programme (FSMP)*

##### Contextual information about the patient

- Can you tell me a little about yourself?
- Can you tell me about how long you have had Fibromyalgia (FM)?
- Can you explain how FM has impacted on your life?

##### Fibromyalgia Self-Management Programme (FSMP)

- What was your experience of the FSMP?
- What do you think worked well or not so well?
- What do you think could be improved?

##### Behaviour change (BC)

- What did you learn from taking part in the FSMP?
- Have you implemented any of the self-management strategies that they taught you on the programme?
- How else did the FSMP programme help you make changes to improve your FM symptoms?

##### Training package

- What information should be in FSMP training package for professionals?
- What input would you like to have in developing this training package for other professionals?

**FIGURE 1** Patient topic guide

### Therapist - topic guide

#### *Intervention mapping of a Fibromyalgia Self-Management Programme (FSMP)*

##### Contextual information about the therapists

- What is your professional background?
- How long have you been qualified?
- How long have you been involved in delivering the FSMP?

##### Fibromyalgia Self-Management Programme (FSMP)

- What are your perspectives on the content?
- What do you think worked well or not so well?
- Are there particular patients that do well or not well on this programme?
- What do you think could be improved?

##### Behaviour change (BC)

- What is your understanding of BC interventions?
- What elements of the programme do you think facilitates BC?
- Are there any elements that you think might not facilitate BC?

##### Training package

- What information should be in an FSMP training package for professionals?
- What input would you like to have in developing this training package for other professionals?

**FIGURE 2** Therapist topic guide

attendance. Postal invitations, a patient information sheet, a reply slip and prepaid return envelope were sent to patients following completion of the course. Qualitative interviews with patients focused upon their experiences during the course and whether they had made any changes to their behaviour since attending the programme. Three interviews were conducted face to face, and six by telephone. Patient interviews lasted between 28 min and 1 hr 7 min (mean 43 min).

All interviews were recorded using a digital encrypted recorder, transcribed verbatim and then imported into the NVivo10. Therapist and patient participants provided either written consent for face-to-face interviews or verbal consent for telephone interviews.

## 2.4 | Data analysis

Observation of the 4- and 6-week programme and the review of the therapist manual data were deductively coded against the BCT (Michie et al., 2013) using the framework approach (Richie & Lewis, 2003c; Gale et al., 2013). The framework approach uses a matrix-based method to analyse qualitative data and includes familiarisation with the data, the creation of a theoretical framework, indexing the data according to the framework and the creation of summaries from the indexed data. Using the framework method, a matrix was created using the BCT codes. Additional codes were created when the data did not directly map to the taxonomy. All data were coded by one researcher (KW), to confirm coding reliability against the BCT, and a second researcher (JP) double coded two sets of observation notes. NVivo reliability testing was used to score interrater reliability, and any nodes with less than 80% agreement were reviewed. In total, six nodes were found with reliability scores ranging from 68.7% to

79.5%. A review of these nodes found that both researchers had coded for the same BCTs; however, one of the pair had coded for additional BCTs or included more or less of the text. Interview analysis was guided by the semistructured topic guide and findings from the BCT mapping. Patient and therapist views on the content of the programme and BCTs were added to the framework.

### 3 | RESULTS

#### 3.1 | Mapping and observations

Observations were carried out on 10 FSMP sessions including 21 participants (19 female and two male), seven on the 6-week course and 14 on the 4-week course. The FSMP coded onto 12/16 BCT domains: goals and planning, feedback and monitoring, social support, shaping knowledge, natural consequences, comparisons of behaviour, repetition and substitution, comparison of outcomes, reward and threat, regulation, antecedents and identity. These encompassed 22 behaviour change techniques. An overview of the domains and specific techniques with supporting evidence from the course is shown in Table 1. The results provide a detailed overview of the key areas of behaviour change within the FSMP with BCT components highlighted in italics.

#### 3.2 | Patient and therapist views

Four therapists and nine patients were interviewed. Table 2 provides an overview of demographics. Patients and therapist views on the content of the course are integrated throughout the results.

#### 3.3 | Goals and planning

The results show that the FSMP mapped strongly to the *goals and planning* domain. Specifically, the FSMP utilised five specific behaviour change techniques: *goal setting (behaviour)*, *problem-solving*, *action planning*, *reviewing behaviour goals* and *discrepancy between current behaviour and goal*. Participants attending the course set short-term goals in Week 1 of the 4-week programme and Week 2 of the 6-week programme. These were reviewed at the halfway point of each programme. Medium-term goals were set at the final session of the programme. Therapists highlighted the importance of setting SMART goals ensuring that they were 'specific, measurable, achievable, relevant and timely' (Bovend'Eerd, Botell, & Wade, 2009). An example of an observed short-term goal was to swim on Wednesday for 15 min at a local leisure centre. The confidence of patients to achieve their goal was measured, and if patients reported low confidence in attaining their goal, it was reviewed and amended.

Participants noted that the goal-setting exercise was particularly helpful in changing their activity levels. During the task, the majority of short-term goals related to activity and exercise, for example, take the dog for a 20-min walk after work three times per week.

I try to do something every day I mean I try and do a little bit of housework every day now just to keep on top of everything. Patient participant—Jean

The interviews with the therapists highlighted that setting small achievable goals enabled participants on the programme to review and subsequently change their behaviour.

It's sort of trying to do things in such a way that people can follow it easily, and then we can review each week on their progress and like the little tasks we might give them, and things like that, so I think that works well. Occupational therapist—Heather

Halfway through the course, patients reviewed their behaviour goals. The therapists prompted each patient to feedback to the group about their progress and any barriers they experienced. The process of reviewing participant's goals enabled the therapists to highlight discrepancies between how their existing behaviour might be undermining their ability to succeed. When reviewing short-term goals, both therapist and patients used *problem-solving techniques* to identify barriers to specific self-management behaviours and develop strategies to overcome identified obstacles and setbacks. This process was outlined by one of the therapists, who described breaking down the intended task into smaller components for the participant.

So picking it apart is quite nice or kind of doing it in a way where they kind of you know so ... what would happen if you did this, what would happen if you do that. Oh I could ... oh maybe I could do one box or something like that ... because I think her goal, in the end, was to get one box of books and sort them out ... So it's almost like your chipping away at it. Occupational therapist—Angela

Another therapist highlighted how setback planning was helpful for patients in making positive life changes.

... I think that the biggest thing that they find helpful is the 'set back planning'. [...] So they haven't gone back into a sort of downward spiral, and they've managed to, or some people have made significant life changes like given up their job, retired, split up with a partner things like that. Physiotherapist—Kimberly

#### 3.4 | Feedback and monitoring

*Feedback and monitoring* was applied using two behaviour change techniques: *feedback on behaviour* and *self-monitoring of behaviour*. Managing fatigue is essential in the management of FM, and therefore, the course assessed the patients' current activities and daily energy levels. In Week 1 of the programme, attendees were asked to complete a 7-day home-

**TABLE 1** FSMP mapping to main BCT area and supporting FSMP evidence

BCT domain	Behaviour change technique	FSMP session			
1	Goals and planning	Goal setting (behaviour)	Short-term goal setting Medium-term goal setting		
		Problem-solving	Review of short-term goals and barriers to achieving goals Memory aids Setback planning Barriers to pacing		
	Feedback and monitoring	Action planning	Short-term goal setting		
		Review behaviour goal(s)	Medium-term goal setting		
		Discrepancy between current behaviour and goal	Pacing		
	2	Feedback on behaviour	Review activity charts		
		Self-monitoring of behaviour	Completion of activity charts		
3	Social support (unspecified)	Identification of social support network as a whole			
	Social support (practical)	Identify practical social support network			
	Social support (emotional)	Identify emotional social support network			
4	Shaping knowledge	Instruction on how to perform a behaviour	Relaxation Stretches Hydrotherapy		
		5	Natural consequences	Information about health consequences	Benefits of relaxation Benefits of hydrotherapy Diet and nutrition talk
				6	Comparison of behaviour
7	Repetition and substitution	Behavioural practice/rehearsal	Stretches Hydrotherapy Relaxation		
		8	Comparison of outcomes		
				9	Reward and threat
Self-reward	Goal-setting motivation				
10	Regulation	Pharmacological support	Medication talk		
		Reduce negative emotions	Pacing Challenging negative thoughts		
		11	Antecedents	Body changes	Relaxation
Restructuring the physical environment	Sleep advice				
12	Identity	Framing/reframing	Pacing External versus internal locus of control Challenging negative thoughts		

Abbreviations: BCT, behaviour change taxonomy; FSMP, Fibromyalgia Self-Management Programme.

based activity diary by colouring in an hourly chart (high-energy activity: red, low-energy activity: yellow, rest: green, sleep: blue and crash: black). The diary aimed to monitor both activity and energy levels over the course of 1 week to support self-identification of boom and bust patterns. In Weeks 2/4 and 3/6 of the programmes, therapists invited patients to talk through their activity diary with the group. Activities that

resulted in increased levels of fatigue, subsequent sustained low levels of physical activity and inactivity were identified. This process also allowed the therapist to provide feedback and prompt patients to modify their behaviour and to promote pacing techniques. Not all patients completed the home-based activity diary, and only those who volunteered to share their diary received feedback.

**TABLE 2** Staff and patient demographics with pseudonyms

Participant	Pseudonym	Staff/patient	Gender	Length of time delivering FSMP (years)
S1	Kimberly	Physiotherapist	Female	8
S2	Michelle	Physiotherapist	Female	8
S3	Heather	Occupational therapist	Female	3
S4	Angela	Occupational therapist	Female	8
P1	Jean	Patient	Female	—
P2	Linda	Patient	Female	—
P3	Helen	Patient	Female	—
P4	Samantha	Patient	Female	—
P5	Maria	Patient	Female	—
P6	Donna	Patient	Female	—
P7	Gillian	Patient	Female	—
P8	Rachel	Patient	Female	—
P9	Karen	Patient	Female	—

Abbreviation: FSMP, Fibromyalgia Self-Management Programme.

Patients who engaged in this activity found that the act of creating a visual summary of their activity patterns helped them to identify negative behaviours.

... it was when we coloured in those codes of highlighting the different activities and actually whether it uses a lot of energy, whether it doesn't. That was such a big eye-opener [...] I didn't think that was going to be quite so high and it actually really is that's why I am feeling so tired. That was my ultimate favourite thing ....  
Patient participant—Helen

The therapist noted that the activity diary was a useful way to engage participants to make changes to their behaviour.

The activity diary that we get them to fill out ... we kind of do like the pacing and the activity management talk in week two and then give them the activity and sleep diary to fill out, and then the week after, in week three, we review that with them. And so again there's a little bit of participation on their part which helps them to take a bit more ownership of some of the changes that they might need to make. Occupational therapist—Angela

### 3.5 | Social support

The identification of *social support* was encouraged by the therapists in Weeks 3/4 and 6/6 of the programme. The therapists helped patients to identify key people within their social support networks as potential sources of unspecified, emotional and practical social support. Additionally, the therapists supported the patients to consider under what circumstances they may need to access social support and offered possible solutions if they were unable to identify an active support network.

### 3.6 | Shaping knowledge

*Shaping knowledge* used two BCTs: *instruction on how to perform a behaviour* and *information about antecedents*. To promote activity and reconditioning, patients were introduced to gentle stretching exercises and guided relaxation. Patients were given verbal instructions during the sessions and written instructions in their booklets. The BCT domain *information about antecedents* of behaviour was evident in the sleep and pacing sessions. In Weeks 1/4 and 2/6, therapists gave a talk on sleep, including general knowledge about sleep and the sleep cycle, the relationship between sleep and FM and sleep management advice. Therapists highlighted behaviours that lead to poor sleep and behaviours that can promote good sleep.

Well in terms of changing like your sleep pattern that might be easier for people I think than making changes with pacing because with your sleep they might be able to sort of try a new medication or they might be able to sort of yeah adjust their sort of wind-down routine or their kind of habits with. Occupational therapist—Angela

Some patients found the practical sleep tips most helpful; for others, it was understanding more about the link between sleep and pain.

The sleep I bought myself some blackout curtains I'm going to get myself a new bed because I understand the importance of um ... I mean I've been thinking about these things for a long time but the substance P and your melatonin and all of those sorts of things, which I was just aware of but you don't always relate it to yourself. So that's been very, very helpful. Patient participant—Rachel

### 3.7 | Natural consequences, comparison of outcomes and regulation

The BCT domains *natural consequences* and *comparison of outcomes* were delivered through *information about health consequences* and *credible source*. These techniques were used in the dietary and nutrition advice delivered by a dietitian in Weeks 3/4 and 4/6 and the medication education sessions delivered by a specialist medication nurse in Weeks 3/4 and 6/6.

The medication talk also included the *regulation* domain BCT *pharmacological support*. The nutrition talk provided information on how diet can affect FM symptoms, management of IBS and the FODMAP diet (a diet low in fermentable carbohydrates).

The medication session provided information on the different medications available to help manage FM, the analgesic ladder, how the medicines work and how to take them. Patients were encouraged to ask general medication questions. One patient described how the information in the medication talk helped her changed her medication schedule.

I would be quite dizzy and really fatigued and everyone else said oh you take it you know 12 hours before you want to get up. [...] I had assumed it was a sleeping tablet so you take it and it helps you sleep [...] and then I just went out of interest, went home that night took it at teatime. Got up for the first time in about a year, I got up and seen my children go to school. Patient participant—Samantha

Another patient reflected on what she had learnt from the nutrition talk.

... the food definitely what people are eating, anything they can tell you that's going to help you know but I do, my diets totally changed obviously and now like most days my family laugh because I have salad a lot. Patient participant—Sarah

The therapists acknowledged the benefits of additional healthcare professionals support in the delivery of the FSMP.

I think it's nice that the nurse, the specialist nurse comes and does the medication talk, and the nutritionist comes and does a ... well the dietician comes and does the diet talk, so it gives them a bit of variation as well. Physiotherapist—Kimberly

### 3.8 | Comparison of behaviour and repetition and substitution

*Comparison of behaviour* focused on one technique, *demonstration of behaviour*. This was used in both stretches and hydrotherapy. The

hydrotherapy sessions were offered in the morning of the 4-week course on Weeks 2/4 and 4/4 and at the end of the session on the 6-week course on Weeks 3/6 and 5/6. The therapist first demonstrated the stretch or hydrotherapy exercise and instructed the patients to copy. *Repetition and substitution* focused on *behavioural practice* and *rehearsal* as patients had the opportunity to stretch and relax at the end of each FSMP session. To encourage sustained behaviour change, the therapists actively encouraged these activities to be performed in their own time outside of the course, and additional home practice information was included in the patient manual. Not all patients attended the hydrotherapy sessions, but the feedback from those that did was positive.

I would like more hydro. It takes all the weight off your joints, it's warm. We went through relaxing exercises with the hydrotherapists. Patient participant—Jean

Some patients felt that two sessions were not enough to make a long-term difference and that options to attend follow-on classes, even for a cost, would have been welcomed.

... it would have been nice you know we got to the end of the four weeks, we're going to meet in three months, but that was kind of it, and my dream was that it would get offered .... Patient participant—Gillian

The lack of time and resources needed to teach a water-based exercise routine successfully was noted by one of the therapists delivering the hydrotherapy sessions.

The thing I think we have difficulty with managing is you offer, it's a bit like offering them you know a little taster and then they want more which is the hydro ... you can't teach people an exercise routine in two sessions. Physiotherapist—Kimberly

### 3.9 | Antecedents

*Antecedents* domain covered two techniques: *restructuring the physical environment* and *body changes*. In Weeks 1/4 and 2/6, therapists delivered an education session on sleep advice. The link between FM and sleep, the importance of establishing a good sleep routine and how the physical environment can influence sleep was explained. Specific information about *body changes* was mentioned within the relaxation and stretching exercises. Relaxation techniques used in the sessions were diaphragmatic breathing, guided imagery and body scanning.

### 3.10 | Reward and threats

The domain *reward and threat* was evident in the goal setting and set-back planning sessions utilising *non-specific reward* and *self-reward*, as

patients were prompted to identify possible rewards and self-rewards for making progress towards or achieving their goal (in Weeks 4/4 and 6/6). Patients were encouraged to write down specific rewards in their course handbook while identifying positive methods to help when experiencing a setback. Observation data from the session (4/4) noted that a patient suggested to reward success by choosing an item from a box of 'nice things'.

### 3.11 | Identity

The *identity* domain used one technique, *framing and reframing*. In the pacing talk in Weeks 2/4 and 3/6, the therapist uses the technique to challenge negative thoughts and also discuss external versus internal locus of control. The therapists explained that pacing is given as a way of changing their internal and external motivation by teaching patients that rather than being controlled by symptoms, pacing offers a way to regain control.

## 4 | DISCUSSION

This study provides an in-depth understanding of the behaviour change techniques used in a clinically developed self-management programme for FM. The perspectives of both therapists delivering the programme and patients experiencing it detail how the FSMP facilitated change in patients' behaviours. This is useful as there is currently an underreporting of the active components of healthcare interventions designed to change behaviour (de Bruin et al., 2020).

A review of behaviour change theories and techniques in group-based self-management programmes for chronic low back pain and osteoarthritis by Keogh, Tully, Matthews, and Hurley (2015) found that in 25 articles, a total of 33 of the 93 behaviour change techniques were coded. On average, eight behaviour change techniques were used per study, and the maximum number used was 13 (Keogh et al., 2015). Results show that the FSMP used many more techniques, mapping onto 12 domains and using 22 of the available 93 behaviour change techniques. There is a growing evidence base that demonstrates that interventions that include behaviour change techniques are effective and improve outcomes (Eisele, Schagg, Kraemer, Bengel, & Goehner, 2019). In particular, those interventions that combine behaviour change techniques such as self-monitoring of behaviour, goal setting, providing feedback on the performance and reviewing behaviour goals have greater effect (Dombrowski et al., 2012; Michie, Abraham, Whittington, McAteer, & Gupta, 2009). The number of behaviour change techniques needed for interventions to be useful remains unclear. While interventions to promote adherence to physical activity for people with chronic musculoskeletal pain are suggested to be more effective with a greater number of behaviour change techniques, the optimal number is not reported (Bishop, Fenge-Davies, Kirby, & Geraghty, 2015; Eisele et al., 2019). Conversely,

another systematic literature review suggested that less than seven behaviour change techniques are more likely to have a beneficial effect, arguing that it is better to perform a few BCT competently than many poorly (Meade, Bearne, Sweeney, Alageel, & Godfrey, 2019).

The findings of this study also showed that the FSMP mapped strongly onto the goals and planning domain using five specific techniques. The qualitative interviews with patients and therapists indicated that these techniques were a powerful tool to facilitate behaviour change in participants on the programme. The use of goal setting is a strategy that has been successfully used in self-management interventions for long-term conditions (De-Silvia, 2011), a range of musculoskeletal conditions (Coleman et al., 2008; Hurley, Walsh, Mitchell, Nicholas, & Patel, 2012) and on pain management programmes (Damush et al., 2016; Hutting, Johnston, Staal, & Heerkens, 2019).

In the FSMP, patients created person-centred goals and achievable action plans. Filoramo (2007) highlighted the importance of goals being relevant and holding meaning for the individual. This view is supported by evidence from a randomised controlled trial with patient-led goal setting found to be effective in improving disability, pain, quality of life, self-efficacy and fear of movement in people with chronic low back pain (Gardner et al., 2019). Offering a theoretical explanation, Bandura (1977) suggests that it is likely that as participants achieve their goals, it increases their confidence and self-efficacy to self-manage.

The findings of this research highlight that there may be a need for continued support to self-manage FM symptoms. In particular, the participants in this study wanted more hydrotherapy after they had completed the programme, highlighting that two sessions were not enough. Aquatic physiotherapy or hydrotherapy is often used as a way for people living with FM to safely and enjoyably increase their physical activity levels, improving physical function and the overall impact of the condition (Bidonde et al., 2014; Lima et al., 2013). Access to community-based aquatic services is challenging in some areas due to the closure of hydrotherapy pools and increased patient cost (Ashe, Furness, Taylor, Haywood-Small, & Lawson, 2017; Martin, Gilbert, & Jeffries, 2018).

Adhering to and continuing with positive health behaviours can be challenging. Self-management interventions for FM and chronic musculoskeletal pain conditions provide short-term and medium-term benefits, which tend to diminish over time (Du et al., 2017; Hammond & Freeman, 2006). Behaviour change interventions targeting physical activity in FM have also reported limited short-term success (O'Dwyer, Maguire, Mockler, Durcan, & Wilson, 2019). The perceived need to seek further advice from healthcare professionals or peers may be helpful for some participants with long-term persistent pain when engaging with behaviour change, such as introducing pacing and increasing physical activity levels. This is highlighted by Moore, Holden, Foster, and Jinks (2020) in a longitudinal qualitative study exploring the barriers and facilitators to exercise in patients with osteoarthritis knee pain. They found that ongoing support and supervision facilitated longer-term adherence



to exercise and physical activity. Additionally, the need for continuing social support is noted with groups continuing to meet after completion of an exercise programme for people with inflammatory arthritis (Domaille et al., 2019).

## 5 | STRENGTHS AND WEAKNESS OF THE STUDY

A strength of this study is that multiple sources of evidence were used to map the FSMP to the BCT. Triangulation of data sources and methods is commonly used in qualitative research to demonstrate credibility and improve quality (Denzin, 2017; Noble & Heale, 2019). In this study, both the manuals of the patients and the therapists were reviewed, and observations of the FSMP delivered by several therapists were conducted. To strengthen the data set, additional qualitative interviews with both patients and therapists were conducted. The credibility of qualitative research can also be demonstrated by making explicit the process of coding and the derivation and identification of themes (Tong, Sainsbury, & Craig, 2007). In this research, deductive coding was conducted independently by two researchers, and inter-rater reliability was good.

A limitation of this research was that although patients who had started but then withdrew from the FSMP were purposively sampled, none were interviewed. This means that the findings may be biased to those who had positive views and experiences of the programme. Another limitation of the study is the predominately female sample; this is not however surprising given the prevalence of FM in females compared with males (Mas et al., 2008; Wolfe et al., 1995). Men were observed while the FSMP was delivered; however, despite inviting male FSMP attendees to take part in the interview component of the research, none agreed to be interviewed. Future studies should explore male perspectives to understand if there are any gender differences. As occupational therapists and physiotherapists delivered the majority of the FSMP, a pragmatic decision not to interview the additional healthcare practitioners (HCPs) involved in the delivery of the programme. Finally, this study was designed to map the FSMP using qualitative methods, and although the data support that patient behaviour change occurred, this study provides no evidence of objective effectiveness in the short term or long term. Future work exploring the course effectiveness should be the next step.

## 6 | CONCLUSION

The clinically developed FSMP utilised a range of behaviour change techniques. Patients who attended the FSMP report making changes to their behaviour, which enabled them to manage their symptoms of FM more effectively. Future research is needed to assess the effectiveness of FM self-management programmes objectively and whether these programmes facilitate long-term behavioural change and symptom improvement.

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## CONFLICT OF INTEREST

The authors declare that they have no competing interests. NW has a role in ARC West.

## AUTHOR CONTRIBUTIONS

JP was involved in the study conceptualisation, design, data collection, analysis and interpretation of the data and cowrote the first and subsequent drafts of the manuscript with KW. KW was involved in data collection, analysis and interpretation of the data and cowrote the first draft and subsequent drafts of the manuscript with JP. NW, FC, SD and JR were involved in the study conceptualisation and design of the study. All authors read and approved the final manuscript.

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