

Implementing a Psychology and Physiotherapy Pain Management Back programme within a Spinal Surgical Service: A Service Improvement Project.

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Abstract

Background: The backpack programme is a psychology and physiotherapy pain management programme aimed at reducing psychosocial risk factors associated with back pain. Psychosocial risk factors have been shown to negatively influence pain experience, thus impacting on function and disability. Evidence has shown that targeting modifiable risk factors through early identification can improve outcomes. Providing pain management interventions within the spinal surgical service may support people in the long-term management of their condition.

Aim: To assess the feasibility and the acceptability of the backpack pain management programme in the spinal surgical service to inform service provision.

Method: Feasibility was assessed through recruitment rate and retention as well as patient reported outcome measures pre- and post-group. Acceptability was assessed by patient experience questionnaires post-programme and thematic content analysis of qualitative audio interviews.

Setting: The intervention took place in a pain management department at North Bristol NHS Trust.

Results: The recruitment rate was initially slower than anticipated. 14 patients were referred by spinal consultants over a 5-month period and of those assessed, 11 were invited to the programme. Feasibility showed recruitment issues and dropouts at the start of the intervention. However, retention for group starters was good and outcome measures reflected improvements in function, confidence and quality of life. Emergent themes were understanding the condition, facilitating peer support and self-empowerment. For those completing the course, high acceptability and patient satisfaction was shown.

Conclusion: The delivery of this intervention is feasible and acceptable for the attendees in this project, although dropout rates and recruitment issues need to be addressed in future service provision. Screening patients for psychosocial risk factors on initial consultation within spinal surgical services may allow stratification for the level of care provided. This would enable those who would benefit from a pain management approach to have support earlier in the pathway, thus impacting on longer term outcomes and improving quality care for patients.

Keywords

Back Pain, Thematic analysis, Pain Management Programme, Feasibility, Acceptability

Introduction

Reducing the impact of psychosocial risk factors through early identification and stratified care may help support people to self-manage their pain in the long term and has been shown to improve outcomes (6, 29, 30). This MDT approach is less well established

within spinal surgical services. This service improvement project aims to assess the feasibility and acceptability of providing a pain management group intervention for patients within the spinal surgical services to inform future service provision.

The use of biopsychosocial interventions with patients with chronic low back pain are well established (1, 2, 3). This reflects the complex and multifactorial processes influencing pain modulation and the level of pain perceived. Modifiable psychosocial risk factors have been shown to be important contributing factors

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to the level of pain and function for patients with low back pain, with or without sciatica (4, 5, 6). Fear avoidance, beliefs, expectations of treatment and emotional distress are all important factors that modify pain severity (6, 7, 8). Psychological interventions addressing risk factors using cognitive and behavioural approaches can improve function, confidence, and reduce the negative consequences of pain on quality of life (5, 6).

Within spinal surgical services a large proportion of people referred are non-surgical candidates (9). For many people with back pain, there is no clear diagnosis, and many people have general pain presentations (9, 10). Only 5-10% of people with low back pain will have clearly identifiable contributing factors on imaging (10). For those where surgery is recommended, pain can continue to persist despite neuroimaging results indicating success (11,12). Statistical analysis of the numbers of people living with long term pain post-surgery are complicated by the level of chronic pain pre-surgery and the broad population these statistics cover (13). However, it is reported to be between 20 and 50% (13-17).

There is evidence that psychosocial risk factors can affect post-surgical outcomes (18-20). These include anxiety and depression, fear, catastrophising, and negative thoughts and beliefs (13, 21-24). Self-efficacy and locus of control have also been documented as potential influencing factors in predicting post-spinal surgical disability and function (22, 25). Psychological screening and pain management are often integrated as part of the spinal cord stimulation pathways. This multidisciplinary team (MDT) approach to care is less well established in spinal surgical services (18,26).

Systematic reviews and meta-analyses showed that psychological and cognitive behavioural therapy (CBT) interventions pre and post spinal surgery improved pain levels, disability and quality of life (23, 26). A review by Jansen et al (2021) showed no benefit in prehabilitation programmes however, they found nearly half of the studies included did not have a psychological component and were educational as opposed to cognitive-behavioural interventions (28). All of these reviews highlighted the limitations in results due to heterogeneity of the psychological measures used and the interventions provided (23, 26, 28).

Reducing the impact of psychosocial risk factors through early identification and stratified care may help support people to self-manage their pain in the long term and has been shown to improve outcomes (6, 29, 30). This service improvement project aims to

assess the feasibility and acceptability of a pain management programme within the spinal surgical service, through the identification of recruitment and retention issues and assessing acceptability. The intervention is aimed at reducing psychosocial risk factors that contribute to worse pain outcomes and functional disability and is run by a pain psychologist and physiotherapist, as recommended by NICE as part of the spinal pathway (5). Providing the intervention through direct referrals from spinal surgical services may be helpful in targeting modifiable factors earlier in the pathway. This service improvement project is designed in accordance with the SQUIRE quality improvement guidelines for service improvement (31).

Method

Recruitment and referral criteria

Referrals were made from spinal surgical services. Inclusion and exclusion criteria were sent to all consultants and is shown in Appendix 1. Inclusion criteria was any spinal pain, inclusive of cause. Exclusion criteria were under 18-year-olds, the presence of red flags that required further investigation or urgent treatment, high levels of disability and poorly managed significant health and mental health conditions that required treatment. Figure 1 shows a CONSORT diagram representing the flow of participants from referrals, through to intervention and the data collection stage. The numbers of referrals were slow initially and this then increased over the course of 5 months. 14 people were referred and 13 were assessed. 2 people were not deemed appropriate for the programme; 1 who attended a more supportive 12-week programme due to a widespread pain and fatigue condition significantly affecting functional levels. The other was a person who had previously attended a pain management programme and had good self-management strategies therefore was offered individual follow ups. 1 person failed to attend assessment.

Intervention

The intervention consisted of a face-to-face biopsychosocial assessment which took place in the pain management department at Southmead hospital, Bristol. These were undertaken by an experienced pain management physiotherapist who also ran the group intervention. Patients deemed appropriate were then invited to attend the 6-week programme.

The 6-week programme was led by a physiotherapist and a pain psychologist. The sessions were two and a

half hours long. A summary of the group intervention is outlined in Table 1. The core component used a mixed model approach incorporating components of cognitive behavioural therapy (CBT) and compassion

focused therapy (CFT). The aim was to improve peoples' insight and understanding of pain and the links between behaviour, thoughts and feelings.

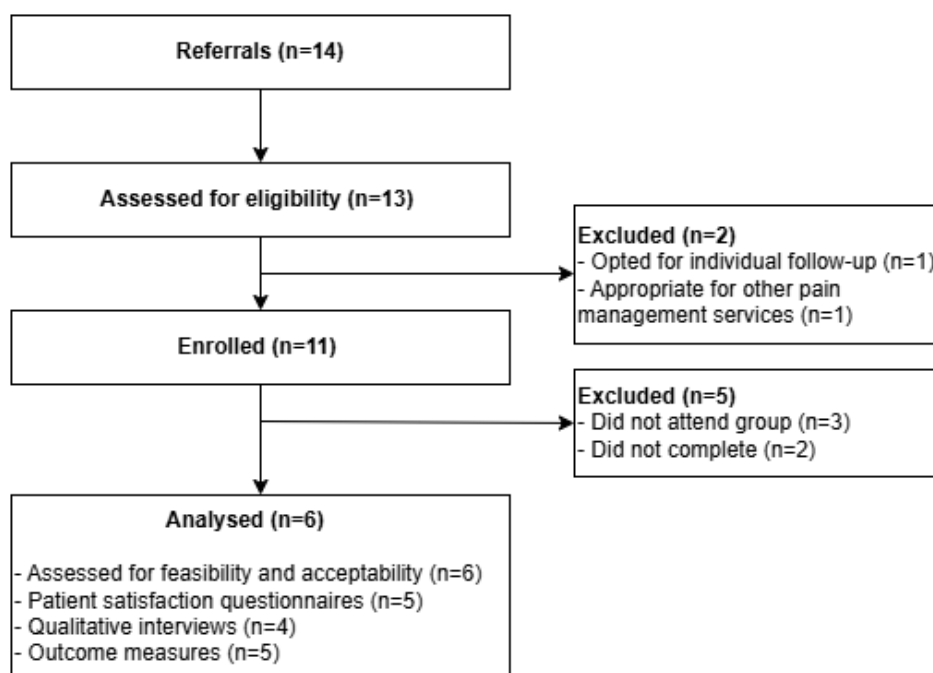


Figure 1: CONSORT diagram depicting the study from recruitment to analysis.

Table 1: Summary of 6-week group content

Week	Content	Supporting resources
1	Consequences of pain Functional model Introduction to pain mechanisms Introduction to exercise and activity management Introduction to goal setting	Stretch sheet/ activity management handout. Pain mechanisms handout and video links Goal workbook
2	Structure V Pain Stretches continued Priorities for change/ action plans	Stretch video link
3	Modifiable risk factors Stress and relaxation Action planning	Risk management handout Stress and relaxation handout / links to relaxation downloads
4	Back fitness / introduction to strength and stability Sleep Action planning	Strength exercise sheets and video links Sleep handout
5	Strength and stability continued Posture Flare-up management Action planning	Flare-up plan Flare-up handouts
6	Thinking and Compassion Self-care planning/ actions and defences	Self-care plan thinking handout

Consent

Informed consent was taken at all stages of this process. Ethical approval was not deemed necessary as this study was identified as a Service Improvement Project by the research department at North Bristol NHS Trust.

Feasibility Assessment:

Feasibility in this project aimed to test the process of the intervention and the appropriateness of this to inform future service provision (32). Measures were recruitment rate and retention. Recruitment rate related to the time taken for referrals and the numbers of participants invited onto the group. The drop out ratio and retention of participants provided further information to the feasibility of the service provided. Patient reported outcome measures (PROMs) were used to reflect feasibility of the group intervention.

Outcome Measures

Pre-assessment and post group PROMS were taken for comparison. These were by forms given prior to the assessment and at the end of week 6 group intervention. Measure were the sTarTBack, tampa scale of kinesiphobia (TSK), Hospital Anxiety and Depression Scale (HADS), Pain Self-Efficacy Questionnaire 1 (PSEQ1), EQ5DS1, British Pain Inventory (BPI), Chalder Fatigue Scale (CFS) and the Pain Catastrophising Scale (PCS). These outcomes measures are used routinely within pain management group interventions and are validated and tested for reliability (33). These were used to improve the robustness of the feasibility assessment of the project as statistical analysis was not appropriate due to the lack of power. The results are specific to the individuals in the group and cannot be generalised to the wider population.

Acceptability Assessment:

Acceptability in this project focussed on how participants reacted to the intervention (32). This was measured using a patient satisfaction questionnaire provided at the end of the group intervention and audio recorded qualitative interviews post programme.

Patient satisfaction questionnaire:

This was a self-reported questionnaire in a format designed specifically for use in the pain management department. This provided the opportunity for patient feedback on their perceived helpfulness of the

interventions and the quality of the delivery and resources provided.

Qualitative Audio Interviews:

The interview process was conducted with reference to COREQ reporting guidelines (34). Participants in the programme were asked to volunteer for audio interview. Consent was taken for permission to phone them to discuss this at the end of the group intervention. Those that gave consent were then called by a psychology assistant who provided further information. An information sheet and audio consent form were then provided and informed consent taken. Interview recordings were carried out by the psychology assistant working within the department. The interviewer met the group participants to introduce himself at the start of the group intervention but was not involved in the delivery of the group, to support the integrity of the interviews and reduce bias. The interviewer had previous experience with audio interviews within the department. The interviews were 10-20 minutes long and consisted of 7 open questions (Table 2). The questions aimed to inform how acceptable the programme was to the participants. These were used with prompts to check understanding and develop more in-depth data. The interviews were transcribed and coded using thematic content analysis to identify emergent themes by the interviewer. Quotes were presented to illustrate the themes.

Table 2: Interview questions

Questions
What were the main issues living with pain prior to attending the spinal backpack programme?
When you heard about the group, what were your initial thoughts?
What were your desires and hopes from the group?
How was it attending the spinal backpack programme?
What did you learn from the group?
Did the group meet your expectations in relation from your desires and hopes?
Would you recommend this to others?

Results

Participant Characteristics:

Participant characteristics are outlined in Table 3. The age ranges were between 31-75 years old with the mean age at 48.5 years. All participants had significant changes on MRI scan contributing to their back pain. 3 people were identified as potentially requiring future surgery. 3 people had undergone spinal surgery.

Feasibility Assessment

Recruitment and enrolment

11 people were invited to attend the group at assessment stage. There was a dropout rate at the start of the group of 27%. These were lost to follow up and no data was retrieved with regards to reasons for not attending. Of the 8 who started, 2 were unable to continue the group as they were to miss 3/6 sessions due to holidays and work issues. Therefore, of the 11 participants initially accepting the group only 6 completed (54.5%). These participants attended all the sessions and pre- and post-group data were collected for 5 of the 6 participants.

Outcome measures

The results for the individual outcome measures showed improvements for majority of the outcomes taken for these participants. Inferential statistical analysis was not appropriate with the numbers in this study due to a lack of power and cannot be generalised to the population. However, for those attending, improvements were shown pre- and post-group in all outcomes, except the anxiety scale of the HADS that showed an increase in anxiety. There was no change in the TSK. The results for STarT Back, BPI and EQ-5DS1 are shown in Appendix 2.

Acceptability Assessment:

Patient experience questionnaire

5 out of the 6 participants who attended the group completed the questionnaires. One person who left the final session early failed to complete the forms. This person did consent to audio interviews so contributed to the project. The results of the patient experience questionnaires are shown in Table 4. The level of patient satisfaction rating ranged from 8/10 to 10/10 and all participants would recommend the group to others. There was feedback about acceptance of the condition, an improved understanding of pain and sharing ideas with others. This shows good acceptability for those participating in the course. The structure and content were shown to be highly acceptable and appropriate throughout the qualitative interviews.

Qualitative Interviews

4 participants consented to interviews. 3 themes emerged from the interviews. The themes showed acceptability of the group intervention through improving their understanding of the condition, facilitating peer support and self-empowerment. The

themes and subthemes are shown in Appendix 3 with quotes to reflect the richness and depth of the interview data.

Understanding the condition

Subthemes emerged with accepting pain and improving knowledge. Quotes related to having support earlier in their journey;

'I think it would be a much more, like it would be I think, like right at the beginning I would have this quite a bit useful'.

A participant also described the process of navigating the medical system;

'you get unwell and then a lot of it you're kind of figuring out what is going on, you're trying to navigate the NHS, the medical healthcare system, it's hugely exhausting in itself, you don't really have an understanding.....having this guidance right at the beginning, that steer in the beginning in the right direction, um, it would've helped'.

There were elements of reconceptualising the condition. Acceptance came alongside moving forwards with proactive strategies;

'It's just about accepting that and then kind of finding ways of improving'.

A sense of increased control with understanding the triggers was illuminated by the following quotes:

'I think that was a bit of an epiphany to me that I was pushing myself into the flare-ups quite a lot.'

Under the subtheme of providing avenues for development one person reflected;

'I've come away with different avenues of support you know in the sense of things I can do for myself'.

Facilitating peer support

Subthemes of acknowledgement of people in similar situations and shared experience emerged. This reflected in quotes on comforting comparisons;

'You're not on your own'

One person directly reflected how they may disengage in a more diverse group:

'I don't think I would have found that helpful or useful..... we're on the same, like going through the same point'.

Self-empowerment

The subthemes were promoting a positive future outlook and motivation to carry on. A sense of control with better knowledge of how to manage physical activity and exercise were illuminated;

'I think it's made me more proactive' and 'you know at least now we can do things and get some kind of quality of life back'.

Finding ways in which exercise can work within their own lives in a manageable way were seen throughout the interviews;

'So that, I was like, mind-blowing, that only turn as much as you can..... the reps you don't have to kill yourself by doing 20 reps of this every day, like you build it up slowly..... it's almost like unlearning everything that you have been taught previously'.

Themes supported the credibility and acceptability of the intervention for these participants and a sense of empowerment within the group through similarities in their condition. The reflections of the group and coping strategies were positive.

Table 3 : Participant Characteristics (n=6)

Characteristic	Summary data
Mean Age (years)	48.5
Sex (% female)	66.7
Surgery	50% Undergone spinal surgery 50% Identified possible need for future surgery
Diagnosis	33.3% disc prolapse, 33.3% pars defect with spondylolisthesis, 16.7% Schwannomas, 16.7% significant degenerative changes potentially requiring fusion
Work status	66.7% working, 33.3% retired

Table 4- Patient experience questionnaire results

What are 1 or 2 things you might do differently as a consequence of this group	Prioritise taking time to do exercises. Pace myself better Be aware of risks and flare-ups, take time to rest and protect defences.
What was the most helpful aspect	Understanding that not all pain is caused by structural damage. Acceptance.
Least helpful...	I take time to assimilate ideas
Rating out of 10	Handouts / resources 8-10 Format of sessions/ approach 9-10 Delivery / facilitators 9-10
Further comments	Sharing ideas and sharing stories Very useful programme. Has helped me understand pain in a different view
Would you recommend this group to others in experiencing similar difficulties to yourself	Yes x5
What changes could we make to improve what we offer here?	None x5
Please share any further comments or feedback about the group.	Thanks, it's been good to meet others in the same situation

Discussion

Feasibility and acceptability of the Backpain Pain Management Program

Feasibility was shown to require improvements with recruitment issues. 14 referrals were made over a 5-month period therefore recruitment was slower than anticipated. This led to difficulties with the time between initial assessments and the start of the group intervention, affecting the number of participants invited to the group. With dropouts at the start of the group, the numbers of people completing the group were low. Drop out ratios for starting pain management group interventions can be high and there has been shown to be an association between dropouts and negative outcomes, potentially leading to a selection bias in results of interventions (35,36). Despite difficulties with recruitment and dropouts, retention was good. Recruitment would need to be addressed in future interventions, potentially with assessments taking place once a suitable number of referrals have been made, thus improving the efficiency and effectiveness of the service. A further audit would then need to be actioned and outcome data analysed.

The improvement in outcome measures support the feasibility of the intervention and provide further credibility to the questionnaires and the interview themes. The in-depth themes from the interviews are reflected within a 'real life' intervention (32). The participants in this study benefitted from being with others who had similarities. There is some evidence that people may opt-out of more generalised group interventions with a high heterogeneity within the group (35). The selectivity of participants in a smaller group can improve motivation and engagement with a shared lived experience and reduce feelings of isolation (37). This service improvement project showed good acceptability for those who participated in the group sessions. However, there are changes required in recruitment to ensure future service provision that is feasible.

Limitations:

The questionnaire used in this service improvement was designed specifically for use in the service. The outcome measure data was not analysed but presented descriptively due to the lack of power. The reasons for dropouts prior to the group intervention was not followed up and potentially introduced bias.

Providing pain management with spinal surgery: Significance of psychosocial screening and stratified care:

Within the results of the interviews there was evidence of people stating they would have benefited from the programme earlier in their pain journey. There is evidence that psychosocial factors can be modified to impact on the outcomes of pain through early interventions. Early multidisciplinary pain management within the spinal pathway may include the identification of modifiable psychosocial and cognitive-behavioural factors (6,30). However, in the current pathway psychosocial screening is not implemented effectively, therefore considering integrating psychosocial screening earlier in the pathways to ensure stratifying interventions such as pain management maybe helpful (14). This stratification is used with the STarT Back outcome measure in primary care (30, 38). Further consideration is required for whether group intervention or individualised approaches to pain management are appropriate and the best timing with which it is implemented (39).

Empowering people to have a sense of control over these modifiable risk factors through developing and reconceptualising the understanding of pain from biomedical to biopsychosocial perspective, such as the biopsychosocial pain management program delivered in this study, can lead to an awareness that there are avenues for development and can be both motivating and positive with regards to future management (39). This self-empowerment and increased sense of control has been shown to be important in reducing disability and improving long term functional outcomes (22, 25).

Conclusion

This service improvement project has shown to be feasible once recruitment difficulties have been addressed. For those attending the group it was highly acceptable. The lived experience from the participants highlighted the potential benefits of providing pain management programmes within a multi-disciplinary framework. Considering a stratified approach to care within spinal services using an MDT approach may support and empower patients thus improving long term outcomes.

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Appendix 1: Referral criteria

Inclusion criteria

1. Low back / thoracic / neck pain over 3 months duration, constant or relapsing-remitting pattern. This is inclusive of cause i.e. Radicular pain, structural; provided it does not fall within exclusion criteria below.
2. Psychosocial risk factors present; psychological wellbeing impacted. This includes low mood, depression, anxiety, stress, and distress provided it does not fall with exclusion criteria below.
3. Individuals may not be at previous level of function and avoiding some previous activities i.e.. exercise / hobbies. Lack of confidence in activity present.
4. Work issues- Struggling to maintain work / reduced hours / on lighter duties / struggling with sickness / off work. Distress and dissatisfaction surrounding work issues.

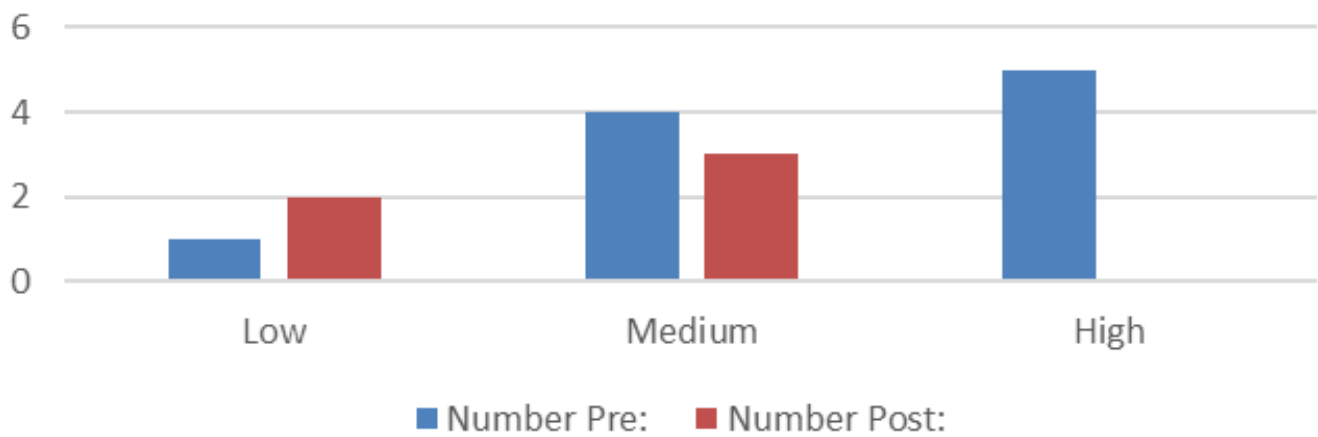
Exclusion Criteria

1. Under 18 years of age
2. Red flags / medical concerns requiring further investigation.
3. Pain because of cancer or ongoing cancer treatment
4. Poorly controlled medical conditions which may influence ability to do pain management.
5. Multiple medications including opiates.
6. High level of disability / low function including the use of significant walking aids (more than a stick outdoors), adaptations in the house, scooters etc.
7. Significant and un-managed mental health difficulties that require support / active current risk to self or others.
8. Significant substance abuse
9. People who do not want to engage with self-management.

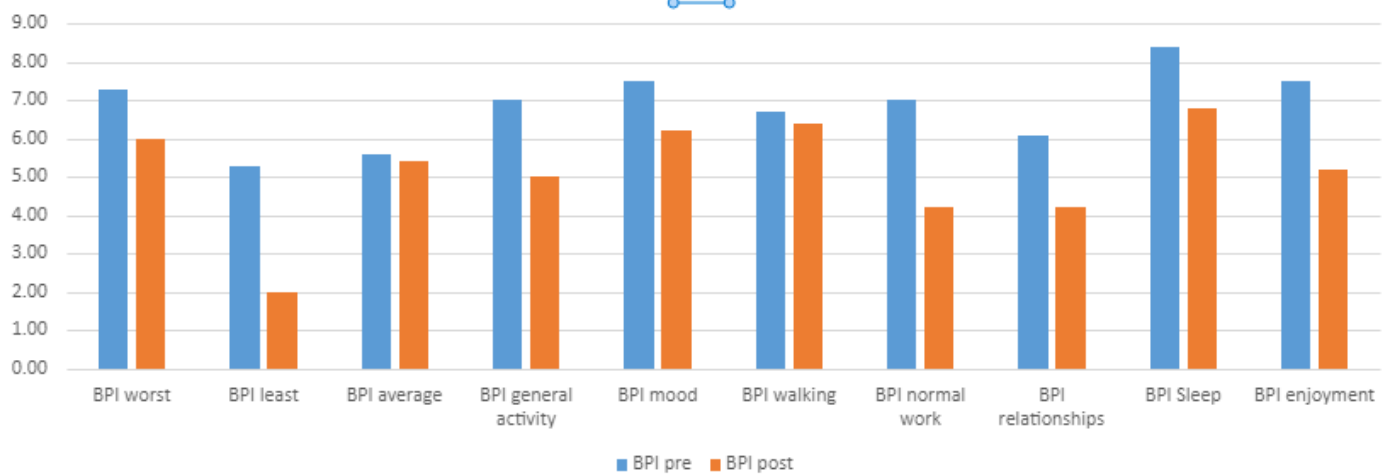
Note: High disability or high psychological risk component may indicate support from pain management via pain clinic / community psychological services.

Appendix 2: Outcome measures pre and post programme

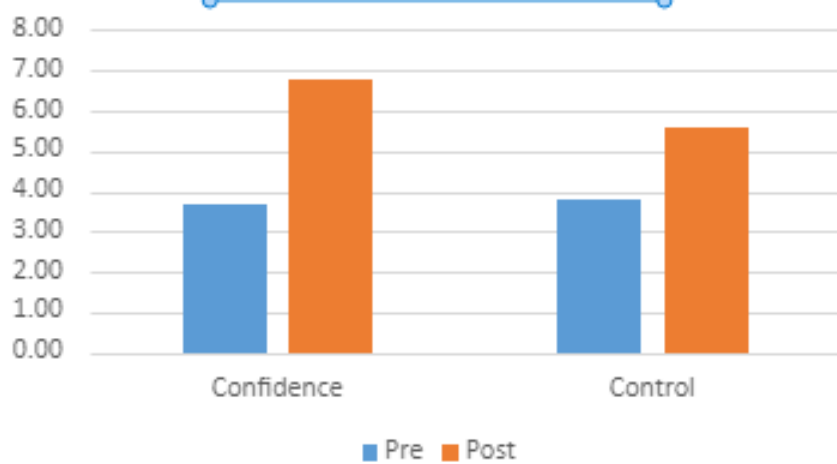
STarT Back Scores

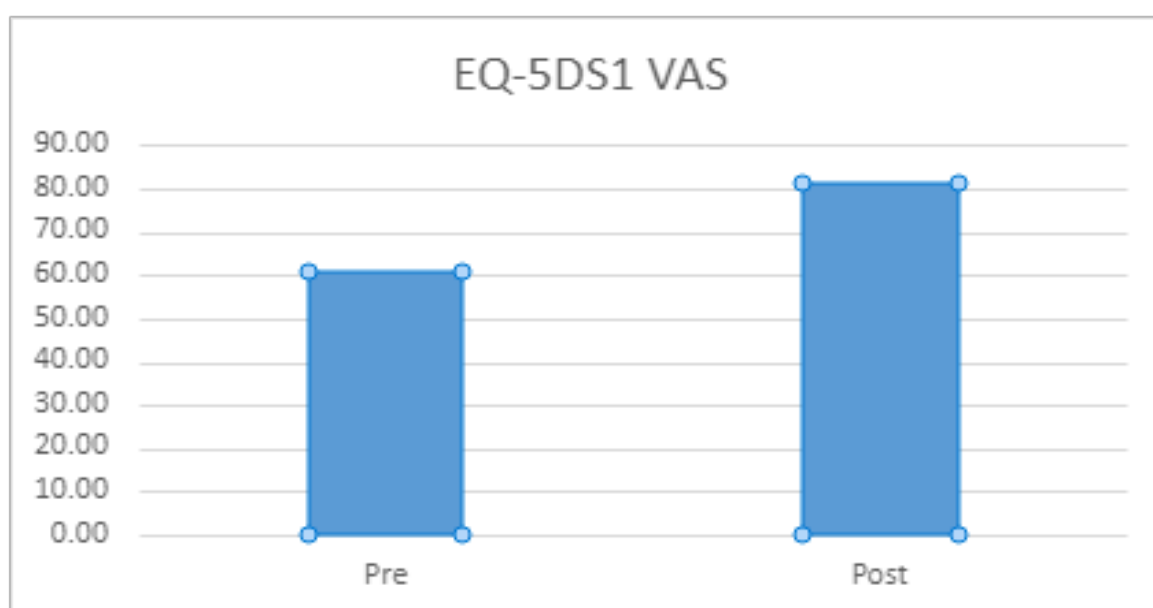
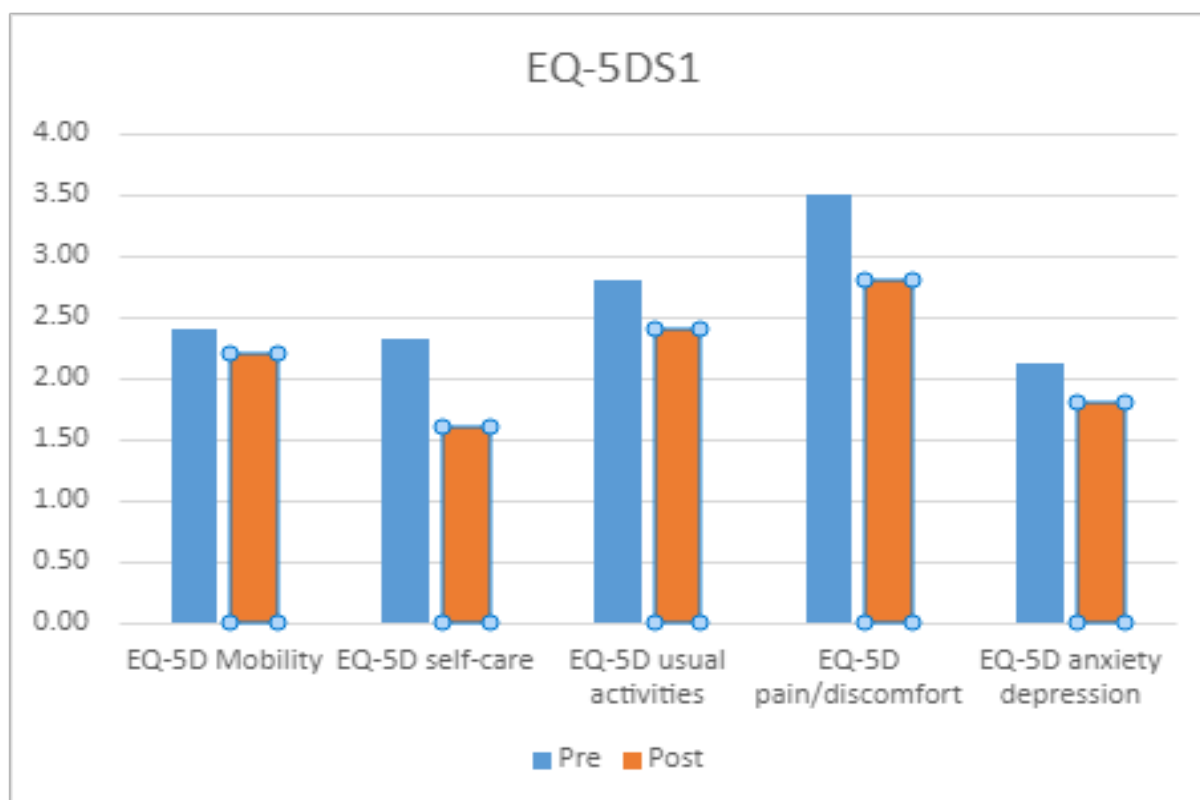


BPI



Confidence and Control





Appendix 3: Qualitative interview themes

Themes	Quotes
Understanding the condition Accepting pain: Improving knowledge: Understanding triggers	'It's just about accepting that and then kind of finding ways of improving'. 'you get unwell and then a lot of it you're kind of figuring out what is going on, you're trying to navigate the NHS, the medical healthcare system, it's hugely exhausting in itself, you don't really have an understanding.....having this guidance right at the beginning, that steer in the beginning in the right direction, um, it would've helped' 'with activity.....you can be too hard on yourself sometimes thinking oh why don't you do more..... they talked about that and I think that was a bit of an epiphany to me that I was pushing myself into the flare-ups quite a lot.'
Facilitating positive habits	

Providing avenues for development	‘there’s these things that you can do, it would’ve cut me out a good couple of years of suffering cause I would’ve had these coping mechanisms earlier’ ‘I’ve come away with different avenues of support you know in the sense of things I can do for myself’ ‘the psychology of it but um, but both came, you know, both umm sides, the medical side and the psychology side also gave you other avenues of support umm and again ideas’ ‘I think it would be a much more, like it would be I think, like right at the beginning I would have this quite a bit useful’
Facilitating peer support Acknowledgment of people in similar situations: Comforting comparisons Shared experience: Visualising future condition Tips and tricks	‘You’re not on your own, put it that way’. ‘It was with people that have got similar problems so that was nice to realise’. ‘I think it would be in a group of people, just like random people, different levels and you know, I don’t think I would’ve found that helpful or useful.....we’re on the same, like going through the same point.....so I found that helpful.’ ‘obviously I knew that these conditions are lifelong I think that when someone kind of says it out loud I think you almost kind of have that hope.....I think it’s important to hear that.....you know at least now we can do things to get some kind of quality of life back.’ ‘As soon as you’re alerted to the fact, you’re gonna have a flare-up, that you have a written plan’. ‘Somebody else said, oh why don’t you try this, I found this helpful and yes, I’ve done what they’ve said’ ‘I think I’ve learnt that I am too hard on myself’
Self-empowerment Promoting positive future outlook: Re-introducing control Motivation to carry on: Knowing appropriate activities Improving fitness	‘I know I’ve got a thing about..... the drive to do things’. ‘I think it’s made me more proactive’ ‘you know at least now we can do things and get some kind of quality of life back’ ‘So that, I was like, mind-blowing, that only turn as much as you can.....you don’t have to kill yourself by doing 20 reps of this every day, like you build it up slowly.....it’s almost like unlearning everything that you have been taught previously’