

Rotator cuff-related shoulder pain (RCRSP): semistructured patient interviews to explore the barriers and enablers to rehabilitation exercises

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ABSTRACT

This study aimed to explore the barriers and enablers to physiotherapist-prescribed rehabilitation exercises for people with rotator cuff-related shoulder pain (RCRSP) and to guide the development of a theoretically informed intervention for people with this condition. Eleven people receiving physiotherapy for RCRSP (M=69 ± 12 years) participated in semistructured interviews. Data were analysed using content analysis, the Theoretical Domains Framework (TDF). The following barriers and enablers were identified in line with the six themes and assigned relevant TDF domains. (1) The impact of previous knowledge and experience on beliefs, (2) therapeutic relationships, (3) expectations around diagnosis, (4) a long and slow pathway to treatment, (5) patients' experience of doing the home exercise rehabilitation programme and (6) seeing positive outcomes. Patients' beliefs that an investigation was necessary to make a diagnosis are incongruent with clinical guidelines. Several enablers identified that influence adherence to shoulder rehabilitation exercises will inform the development of interventions designed to improve adherence. Our findings highlight the importance of educating patients to alleviate identified barriers to self-management for RCRSP. Furthermore, it underscores the need to train healthcare professionals with the necessary skills to effectively educate patients, specifically about misconceptions and uncertainties about the condition and exercise.

INTRODUCTION

Shoulder pain is a common, disabling and costly musculoskeletal condition experienced by 7%–26% of the general population.^{1,2} This condition is often long lasting, with symptoms remaining after 12 months in over 40% of patients.^{3,4} Rotator cuff-related shoulder pain (RCRSP) is reported to account for 70% of shoulder pain cases.

Advice, education and rehabilitative exercises are recommended as an initial treatment for shoulder pain, and evidence demonstrates improvement in symptoms with specific exercise programmes.⁵ Clinician-prescribed exercises are also

WHAT IS ALREADY KNOWN ON THIS TOPIC

⇒ Rotator cuff-related shoulder (RCRSP) is common and significantly impacts individuals. Conservative management involving rehabilitation exercises is recommended, yet there is a lack of evidence exploring why people do or do not do these rehabilitation exercises.

WHAT THIS STUDY ADDS

⇒ This study explored the barriers and enablers experienced by people with RCRSP to adhering to shoulder rehabilitation exercises. The theoretical framework improves our knowledge and understanding of which behaviour change techniques could enhance adherence to rehabilitation exercises.

HOW THIS STUDY MIGHT AFFECT RESEARCH

⇒ These findings should be used to inform the development of a behaviour change intervention to enhance patients' adherence to shoulder rehabilitation exercises. There is a clear need to upskill healthcare professionals so that they can provide effective patient education strategies.

recommended in clinical guidelines for rotator cuff tendinopathy.⁶ Prescribed exercise programmes often comprise home-based rehabilitation exercises, which are beneficial in promoting self-management and are an important predictor of treatment outcomes in other musculoskeletal conditions.⁷ However, in practice, 50%–70% of patients are either non-adherent or partially adherent to exercise, and little is known about the factors influencing patient engagement.⁸

Even though cognitive and behavioural approaches are required to effectively implement a rehabilitative exercise programme,⁹ few researchers have used a theoretical framework to develop an intervention for shoulder rehabilitation. In addition, the Medical Research Council advocates that interventions should be informed by behaviour change theory



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(BCT).¹⁰ Despite this, education and behaviour change (BC) strategies are frequently developed without a theoretical framework. Systematic reviews¹¹ have shown the underutilisation of BC techniques to promote adherence to home exercise programmes (HEPs). Furthermore, individualised exercise therapy and self-management techniques may enhance exercise adherence for chronic musculoskeletal pain. It was commonly found that social support (using phone calls and text messages to praise participants for doing their exercise answer questions) significantly affected exercise adherence.^{12 13} Understanding the BC techniques that are likely to promote shoulder rehabilitation exercise adherence could inform an effective intervention.

The limited research exploring patients' experiences engaging with shoulder rehabilitation exercises highlighted a clear gap in the literature. Identifying the factors influencing people's adherence to shoulder rehabilitation exercises will inform the development of interventions designed to improve adherence, improve clinical outcomes and reduce costs. This work aimed to use the knowledge gained from identified barriers and facilitators to physiotherapist-prescribed rehabilitation exercises for people with RCRSP to inform the development of a theoretically informed intervention for people with this condition.¹⁴

Objectives

1. To explore patients' in-depth experiences of barriers and facilitators to physiotherapy-prescribed exercises for people with RCRSP.
2. To use the barriers and facilitators to identify themes and subthemes that influence patients' adherence to the prescribed rehabilitative exercises.
3. To map the themes/subthemes to the TDF to identify key domains affecting rehabilitative exercise adherence.
4. To identify appropriate BCTs from the TDF domains to propose a theoretically informed intervention to enhance exercise adherence.

METHODS

Study design

This qualitative study employed semistructured interviews with people who had RCRSP and had consulted with a physiotherapist. An interview topic guide was used to identify barriers and enablers to adherence to shoulder rehabilitation exercises. The topic guide was developed with input from the study advisory group (physiotherapists (n=4) and patient and public contributors (n=3)), and relevant literature (online supplemental appendix 1). The Standards for Reporting Qualitative Research¹⁵ guidelines were used to describe the process followed in this study.

Participants and inclusion

Participants were recruited from physiotherapy departments in NHS Trusts in England. Purposive sampling was used, where participants who received treatment for RCRSP were identified by their treating physiotherapist. Participants were eligible to participate if they met the criteria outlined in table 1.

Patients were signposted to study information and those interested in participating in the study gave consent to be contacted by the first author to discuss their eligibility and, if appropriate, arrange a suitable time for the interview. Before the interview, participants were emailed the consent form and the participant information sheet. They were made aware that they were free to withdraw from the study until the point of analysis of results. Previous literature suggested that interviewing 20–30 participants would be adequate, with data saturation likely to be reached with 10 participants and provide the depth of data and analysis relevant to this study.¹⁶

DATA COLLECTION

Following a pilot interview, 11 semistructured individual telephone or MS Teams interviews took place between June and November 2022. VS conducted all interviews following participants' recorded verbal consent. The duration of the interviews averaged 33 min. The average age of participants was 68.6 years (SD±12.3 years), with 3 males and 9 females. Time since the first consultation with

Table 1 Selection criteria

Inclusion	Exclusion
Aged ≥18 years old	Upper extremity neurological deficit
Had unilateral rotator cuff tendinosis, shoulder impingement syndrome, subacromial pain syndrome or degenerative or traumatic rotator cuff tear diagnosed by a physiotherapist or doctor	Bilateral symptomatic rotator cuff pathology
Planned conservative	Failed surgical management of rotator cuff pathology
Capacity to participate in home-based shoulder physiotherapy	Patients with a non-specific diagnosis
Up to 6 weeks following completing shoulder rehab exercise intervention.	Clinically identifiable massive full-thickness rotator cuff tears, adhesive capsulitis, calcific tendonitis, osteoarthritis
	Or who had a history of fracture or dislocation
	Infection, neoplasm and inflammatory disorders

Table 2 Participant characteristics

Participant id	Gender	Age	Duration of shoulder pain	Involved shoulder	Time since physiotherapy consultation	Work status
P01	M	73	1 year	Right	6 months	Retired
P02	F	53	25 years ago, then flared up 4 years ago	Left	1 year	Retired
P03	F	74	2 years	Right	2 years	Retired
P04	F	55	3 years	Right	3 years	Retired
P05	M	70	12 years	Left	2 years	Retired
P06	M	74	2 years	Right	3 months	Retired
P07	F	81	7 years	Left	1 year	Retired
P08	F	80	5 years	Right	3 years	Retired
P09	F	52	10 years	Left	2 months	Social worker
P10	F	86	3 years	Left	2 months	Retired
P11	F	57	3 months	Right	1.5 months	Teacher

a physiotherapist for their shoulder pain varied between 1.5 months and 3 years. Participants were allocated a participant identification number, and data were pseudonymised and stored on a secure password-protected computer. Participant characteristics are presented in [table 2](#).

Data analysis

Interview data were analysed using content analysis and the TDF, performed using NVivo V.13 (2020, R1, released 2020: QSR International Pty). The TDF consists of 14 domains that outline determinants of behaviour and is used to support BC in healthcare practice.¹⁷ Evidence shows that health BC interventions underpinned by psychological or BCT are more effective than those not.^{18,19} This project used the TDF to identify the barriers and facilitators to shoulder rehabilitation exercises, resulting in transparent and usable results that can be used to underpin future interventions.

Interviews were transcribed verbatim, and a deductive framework was used to assign codes to the raw (first-level coding).²⁰ Content analysis was then used, and all utterances were assigned to TDF domains, creating group subthemes. Thematically, similar responses were grouped in the process of data reduction and compared across transcripts. Domains were identified as salient based on their frequency of inclusion and potential strength of impact.²¹ The schema in [figure 1](#) illustrates the methods that were followed. The first transcript was coded independently by VS and AB. Following consensus, VS completed the coding of the remaining transcripts. The research team (VS, FC and AB) met to discuss the themes and to track developing thinking. The research team maintained researcher reflexivity through the analysis and writing by discussing and challenging assumptions.

The Theory and Techniques tool was then used to identify relevant BCTs to the TDF domains identified in the previous step (see [table 3](#)). Online supplemental appendix 3 describes the BCTs that correspond to numbering in [table 3](#).

RESULTS

Barriers and enablers

The barriers and enablers identified are presented in [table 4](#) and formatted in line with the interview topic guide format.

TDF and mapping to BCTs

A summary of the six themes identified and their associated TDF domains is presented in [table 3](#). Overall, 10 TDF domains were identified as important influences of adherence to shoulder rehabilitation exercises.

Main themes

The findings of the TDF-based interviews are formatted in line with the topic guide with the barriers and enablers presented throughout.

The impact of previous knowledge and experience on beliefs

Participants' previous experience or family members' experience of physiotherapy exercises impacted their beliefs. Those who had successful treatment experiences had positive beliefs that physiotherapy worked (TDF beliefs)

I'm slightly more educated than other people because I've got a daughter with arthritis and complex regional pain syndrome, so I do understand the importance of physio to maintain the body, not just to fix it, so it's possibly that we are slightly more educated and have had unfortunately more experience than most people. [P02]

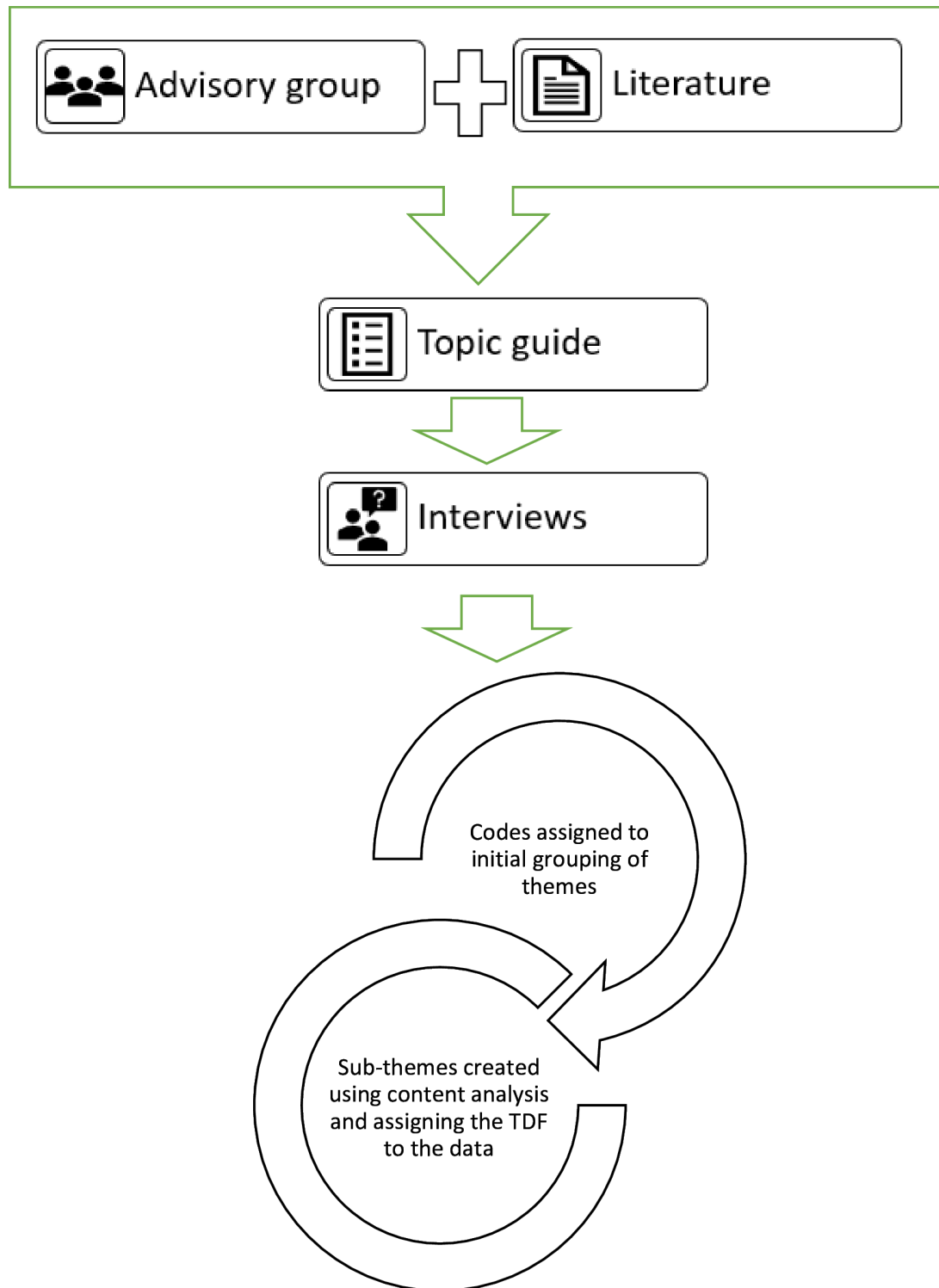


Figure 1 Schema of research methods. TDF, Theoretical Domains Framework.

In contrast, those with no previous physiotherapy experience or who did not experience improvements with previous physiotherapy management for other musculoskeletal conditions did not believe it worked.

I wonder if those experiences make me feel that ... I don't know whether it's going to work in this instance

as well because it'll be the third time that the pre-op hasn't worked or doesn't work. [P03]

One participant did not believe that physiotherapy-prescribed exercises would benefit their shoulder as they had previously had a negative experience with a foot problem.

Table 3 Mapping the Theoretical Domains Framework (TDF) and relevant links to behaviour change techniques (BCTs)⁴⁷

Grouping	TDF														
	Themes	Kn	Sk	SPRI	BACap	Op	BACon	Rein	Intent	Goals	MAD	ECR	SocI	Em	BehR
Previous experience					✓		✓				✓				
		1.2 4.1 6.1 8.1 8.7 15.1 15.3 15.4					5.1, 5.2, 5.3, 5.5, 5.6, 9.2, 9.3, 10.1, 10.8, 10.10				7.1 11.3				
Initial consultation	Investigation						✓					✓			
							5.1, 5.2, 5.3, 5.5, 5.6, 9.2, 9.3, 10.1, 10.8, 10.10					3.2, 7.1, 7.5, 12.1, 12.2, 12.3, 12.5			
Diagnosis															
Patient education		✓													
		2.6, 4.1, 4.2, 5.1, 5.3													
Treatment pathway															
Treatment phase	Home exercise experience		✓			✓	✓	✓	✓	✓	✓	✓			
			4.1, 8.1, 8.7.			1.7		5.1, 5.2, 5.3, 5.5, 5.6, 9.2, 9.3, 10.1, 10.8, 10.10	10.1, 10.2, 10.3, 10.4, 10.6, 10.8, 10.10, 14.2	1.1, 1.3, 1.5, 1.6, 1.7,	7.1, 11.3	3.2, 7.1, 7.5, 12.1, 12.2, 12.3, 12.5			

BACap, beliefs about capabilities; BACon, beliefs about consequences, rein reinforcement, intent intention; BehR, behavioural regulation; ECR, environmental context and resources; Em, emotion; Kn, knowledge; MAD, memory, attention and decision processes; Op, optimism; Sk, skills; SocI, social influences; SPRI, social/professional role and identity.

Table 4 Barriers and enablers to adherence

Theme	Barrier	Enabler
The impact of previous knowledge and experience on beliefs	<ul style="list-style-type: none"> ▶ Not doing previously prescribed rehabilitation exercises and then believing that it doesn't work ▶ Not being listened to by physiotherapist when exercises didn't work ▶ Previously prescribed rehabilitation exercises did not work for another joint problem 	<ul style="list-style-type: none"> ▶ Previous exercise history ▶ Previous successful physiotherapy management
Therapeutic relationships/ communication and level of understanding	<ul style="list-style-type: none"> ▶ Lack of confidence in physiotherapists being able to identify what the problem was 	<ul style="list-style-type: none"> ▶ Knowing what the problem was and being reassured that it would improve ▶ Importance of doing the rehabilitation exercise explained ▶ Feeling as if they were being listened to ▶ Demonstration of rehabilitation exercise ▶ Confidence in doing the rehabilitation exercises
Expectations around diagnosis	<ul style="list-style-type: none"> ▶ Patient belief in the need for investigations ▶ Patient belief that shoulder pain was a mechanical problem 	
A long and slow pathway to treatment	<ul style="list-style-type: none"> ▶ Long treatment journey and delayed access 	<ul style="list-style-type: none"> ▶ Treatment through private healthcare
Patients' experience of doing the home exercise rehabilitation programme		<ul style="list-style-type: none"> ▶ Try rehabilitation exercises instead of surgery ▶ Steroid injection for pain relief ▶ Time to do the exercises ▶ Being able to fit the exercises into the day ▶ Visual cues to remind patients to do the exercises ▶ Incorporating the rehab exercises into daily routine
Seeing positive outcomes increased confidence and engagement with exercises.		<ul style="list-style-type: none"> ▶ Functional improvement and reduced pain

Oh, we will send you to physio and see what they do, so I went to physio. They gave me these exercises, which I couldn't do because every time I tried to go onto my tip toes, my foot just collapsed because it was broken. [P10]

Similarly, when another participant did not experience improvements from a previous knee problem, they sometimes felt dismissed by the health professionals.

It just felt that nobody was listening in the timescale that I was saying that the exercises weren't making a difference to the knee. [P03] (additional TDF, decision making)

Therapeutic relationships/communication and level of understanding

During the initial consultation, patients valued knowing the problem and being reassured that it would improve with rehabilitation exercises (TDF knowledge of condition, optimism).

...basically, he explained it would make it better. I have to do the exercises if I wanted to get my shoulder working again. [P01]

I thought it was brilliant. Put it this way, I could understand it... he just explained that hopefully it would help. [P07]

In contrast, a patient felt that seeing the physiotherapist would not be helpful to find out what the problem was.

the consultant said well, we need you to see the physio and I said well, do I really need to see a physio because the physio hasn't worked in the past, and I would rather just find out what's going on with my shoulder first and then I can make an informed decision as to what's going to be the best appropriate treatment [P09]

There was an inconsistency in patients being told about the importance of doing the exercises.

I do think the physios and the consultants need to spell out much more clearly that if you don't do the physio, it won't work and that if you don't do it really three times a week forever, you will go backwards. I don't think there's any emphasis or clarity placed on the fact that you can go backwards if you don't do the physio. You can't just stop it. [P02]

They really drummed into you the importance of keeping your muscles strong, and so that was

something that I understood [P03] (additional TDF, professional confidence)

Being listened to was important to patients in helping them do the exercises. Being shown how to do the exercises and confidence in doing them (progress, regress). (TDF skills)

The Physio that I saw at the hospital was very nice, and he showed me what to do and explained it and everything [P04]

He was very helpful and was sort of demonstrating the exercises himself the last time I went and we were doing one or two of them together. [P08]

After having had the call, I was reassured... I felt much more confident in going back to doing the sort of exercises that I would've done normally, which I'd sort of restricted myself from doing. [P11]

Expectations around diagnosis: a scan might have revealed something

There was a disconnect between patient care guidelines and patient expectancies (TDF environmental context), with participants believing that investigations should have been undertaken to guide treatment (TDF Beliefs about Consequences, belief expectancy).

I think really you need to find out what's going on before you start with physio... if you have got the scan first or the MRI scan, and if you know what you're dealing with, then you can actually treat the issue. If you don't know what you're dealing with, you can't treat the problem. [P10]

...if they had just scanned the shoulder at the same time as the neck, that might have revealed some things, you know, that was nearly twelve months ago. I might have had that Cortisone injection then, as a result of it and been a lot further on in my recovery. [P04]

Some patients held the belief that their shoulder pain was a mechanical problem and that they needed a scan to find out what was wrong.

...he's seen the MRI scan, and basically, I've got a tear in the shoulder... I am guessing that the tear has been caused due to it catching all the time because my shoulder catches. [P09]

...it started getting a little bit stiff, and then as time went on and I tried to move it more, the pain got more, and then when the doctors told me that it was bone on bone, I realised why. [P10]

A long and slow pathway to treatment

Patients reported long treatment journeys with delayed access to services compounded by COVID-19. Some sought alternative routes to treatment through private healthcare to reduce the waiting time. Lengthy waits for appointments caused patients to feel frustrated. (TDF environmental context)

I just think the whole process was a little bit longwinded, and I just think, if they just, you know, it took two min to have the ultrasound, for somebody with a shoulder injury, why can't you just do an ultrasound straight away and then you can see what the problem is and then you can make a proper decision instead of fanning around [P04]

I also feel that it is a much better approach to the— to trying to deal with the people's problems in one go as opposed to going to see a consultant then go and see a Physio then go and be sent for X-rays [P03]

Patients' experience of doing the home exercise rehabilitation programme

Some patients were given alternative options to specific exercises for managing their shoulder pain.

We talked about swimming ... we did talk about alternative things, we talked about heat and cold and different bits, and we talked about alternative Ibuprofen gel and different bits [P02]

For some, rehabilitation exercises were preferred, while surgery was the alternative. Others wanted an injection to reduce pain and allow them to do the exercises. (TDF belief about consequence, outcome expectancy, optimism and decision-making)

He just basically said there is damage there, and the best course of action at this moment in time is doing a Cortisone injection, and then if that doesn't work, then they'll look at surgery. [P04]

None of the patients were asked to keep a record of doing the exercises. Physiotherapists and most patients gauged improvement by increased functional range of motion and reduced pain. It wasn't clear if keeping a record of the exercises or using specific outcome measures would encourage patients to adhere to the exercises more. (TDF reinforcement)

We looked at the range of my movement as a way of measuring to see if it was improving [P02]

I couldn't move it past... elbow level when I was first there. Now I can get it right over my head. [P01] I've had this pain, and it has been really bad pain. I've had it for ... several years, and it's been getting worse and worse, and I think I'm so happy that the pain is much less and I'm able to use my shoulder much better. [P10]

Most patients were retired and had sufficient time to carry out the exercises.

When I thought about it, that I hadn't done the exercises, I just did it, and you see the difference with me is, like, I'm retired [P01]

I am not sort of particularly busy, so I can do them when I feel like it. [P08]

Patients described how they fitted the exercises into everyday life. Some useful pointers included doing it first

thing in the morning or keeping resistance bands visible to prompt them to do the exercise. (TDF environmental context)

I usually come upstairs, clean my teeth, and then do my exercises [P07]

Two minutes here and there for me. You could do it at the bus stop, couldn't you if you wanted to. [P02]

Some incorporated the exercises into their usual activities.

I said to him how many times a day do you want me to do these, and he said two or three. Just how you can, he said, and you know, when you're doing things around the house or just standing at the sink washing up or anything like that, he showed me one or two things I could do while I was just standing there. [P10]

I've also built the exercises into my Pilates and Yoga that I do, and my shoulder was quite a lot better [P02]

Seeing positive outcomes increased confidence and engagement with exercises

Patients were more inclined to do the exercises if they felt improvements (TDF self-confidence and skill development).

...right at the beginning, that band around my arms, I couldn't believe how that worked. It worked my arm better. After I'd done that for a week or so, I could lift my arm right up but I couldn't honestly lift it above elbow height when I first went down. That helped tremendously. [P01]

I obviously did the exercises and went back, and there was some improvement. I could lift my arm higher [P02]

It's absolutely marvellous from my point of view because I'm in much less pain [P10]

DISCUSSION

This study explored the barriers and enablers to physiotherapist-prescribed rehabilitation exercises for people with RCRSP. Deductive thematic analysis was used to synthesise barriers and enablers to the following sections of the topic guide; initial consultation, HEP experience and patient education. Subthemes were then identified and included the patient's previous knowledge and experience, their relationship with the physiotherapist and understanding of the condition, their beliefs about scans, the treatment pathway, their experience of doing the home exercise rehabilitation programme and the impact of seeing positive outcomes. Subthemes were then mapped to 10 TDF domains and linked to BCTs to illustrate relevant techniques for future intervention development. These findings will inform the development of a theoretically informed intervention to enhance adherence to shoulder rehabilitation exercises.

During the initial consultation, participants who reported successful previous physiotherapy treatment or were aware of a family member's successful treatment indicated a belief in the benefit of physiotherapy exercises. It has previously been reported that patient expectation of benefit is a stronger predictor of conservative treatment outcomes than structural factors, such as a rotator cuff tear.²² In addition, it is recommended that healthcare professionals (HCP) monitor patients' pain self-efficacy (the confidence one has to perform their activities and achieve their goals despite symptoms or pain) as it is a useful indicator of outcomes.²³ For those presenting with an opposing view, White *et al*²⁴ identified the need for HCPs to engage these patients early in the treatment process to address fear, misconceptions and expectations through appropriate educational strategies.²⁴ Participants in our study who had no previous physiotherapy experience or poor experiences did not think that physiotherapy exercises worked. Studies in the UK²⁵ and overseas²⁶ report a lack of public awareness of physiotherapy, highlighting a clear need to raise awareness and knowledge of physiotherapy to encourage autonomous health-seeking behaviours. This approach is consistent with a growing evidence base and aligns with providing patient-centred care for musculoskeletal conditions.

In this study, the patient-therapist relationship was important to support the patient's understanding of their condition and the importance of rehabilitation exercises. These findings are supported by Cridland *et al*,²⁷ who conducted interviews with people with RCRSP (n=8) and found that trusting the HCP who provides education and guidance facilitates adherence to recommendations and reassurance that the condition will be effectively treated.²⁷ Further evidence from a systematic review²⁸ demonstrated that the therapeutic alliance's role in physical rehabilitation positively affected treatment outcomes. Building on the patient-therapist relationship from the initial consultation, the BCT 'social support' (unspecified) is suggested to increase adherence to exercise levels in patients with upper extremity musculoskeletal disorders.^{13 29 30} Supporting patients via telephone calls and text messages with positive reinforcement and encouragement may increase patient optimism and confidence in doing the exercises and self-efficacy.^{13 30} Higher self-efficacy has been linked to improved health behaviours such as adherence. These findings highlight the importance of establishing a strong therapeutic alliance. However, HCP admittedly expressed concerns that there were no formalised or consistent processes towards learning to deliver patient education.²⁴ Our results provide preliminary data on key components to promote an effective therapeutic relationship. Specifically, helping patients understand the problem and address their treatment expectations.

Participants' belief of a pathomechanical cause of their RCRSP and expectation for an unequivocal diagnosis involving imaging is incongruent with clinical guidelines.⁶

Yet the antithesis to this was seen where few patients were exasperated by subsequent investigations revealing relevant findings that they believed should have been scanned at the initial consultation. In a randomised control trial involving 1308 individuals, diagnostic labels used for rotator cuff disease were shown to encourage people to consider surgical treatment.³¹ Terms like subacromial impingement syndrome had a higher perceived need for imaging compared with bursitis, and those labelled with a rotator cuff tear had a higher perceived need for surgery and imaging compared with those labelled with bursitis. Diagnostic imaging for RCRSP is considered unnecessary as it cannot reliably identify a specific cause of the condition and does not inform management decisions.^{32 33} HCPs are encouraged to avoid such biomedical labels for RCRSP, which contribute to a perceived need for unnecessary care and a barrier to patient engagement in self-management. Considering that the evidence shows that diagnostic uncertainty for shoulder pain is apparent in clinicians and patients,³⁴ pieces of advice and education need to expand beyond tissue pathology and include neurosciences, physical activity and lifestyle factors, as outlined in a recent scoping review.³⁵

Patients voiced their frustrations about the lengthy waits for appointments, which was further compounded by the impact of COVID-19. An excessively convoluted and protracted pathway to treatment was described in a multicentre pilot randomised control trial by 20 patients listed for surgical repair of the rotator cuff.³⁶ Better supporting patients awaiting follow-up consultation may improve their experience of the pathway to treatment.

The HEP was the option for some participants instead of surgery. An overview of 15 systematic reviews of RCTs found no differences in clinical outcomes between supervised exercise and surgery in people with shoulder impingement.³⁷ Shoulder-specific exercises were recommended as the first line of conservative management to improve outcomes for people with shoulder impingement syndrome³⁷ and is corroborated in another review for people with subacromial shoulder pain.⁵ A recent meta-analysis compared the effect of conservative and surgical management for rotator cuff tears on pain and shoulder function.³⁸ No significant difference between the surgical and conservative groups in terms of function was found, while the benefit for pain was greater in the surgical repair group at 1-year follow-up. Variations in tendon tears, surgical procedure used and dose of rehab exercises contributed to extensive heterogeneity in the cohorts analysed. Given the burden of surgery and the lack of its superiority over conservative management for RCRSP, these findings provide important evidence for educating patients about their treatment options.

Pain was found to be both a barrier and an enabler for people with RCRSP to perform their HEP. Those unable to do the exercises due to pain justified their perceived need for a corticosteroid (CS) injection, which facilitated a pain-free period for them to engage with the HEP. Systematic reviews show that CS injection may

have a short-term benefit over placebo in reducing pain and improving function^{39–41} while a recent meta-analysis found only a small transient pain relief in a small number of patients with RCRSP.⁴² These findings suggest that the application of CS injection may offer minimal benefit for some patients to allow them to do the HEP.

In some patients who reported that the HEP reduced their pain, it increased their motivation to continue exercising. In another study using semistructured interviews with people with RCRSP (n=12), some interviewees found reduced shoulder pain from doing the exercises.⁴³ Similarly, improvements in the range of movement and ability to perform functional tasks were perceived as a benefit of doing the HEP in the current study. Our findings highlight the scope of developing a core set of meaningful patient outcomes to promote HEP adherence.

A recent systematic review of adherence to HEP showed that demonstration of the exercises facilitated patients doing the HEP.¹¹ The systematic review of RCTs described HEP adherence and the use of BCTs to promote home exercise adherence for people with RCRSP. Though a low mean number of BCTs was used in the included studies (6% of the total 93 BCT⁴⁴), the most used BCT was to teach patients how to perform their HEP. The literature highlights the importance of reporting BCTs' use within interventions, and researchers and clinicians need to understand which BCTs might be most useful in promoting exercise and physical activity.

Further enablers to doing the HEP included the use of equipment and being able to incorporate the HEP into their daily routine. The perceived benefits of using equipment for the HEP concord with other qualitative research where participants reported that resistance bands were an enabler and a visual reminder for patients to do the exercises.⁴³ Another enabler to doing the HEP was allowing patients the freedom to gradually fit the HEP into the patient's day and usual activities. The evidence shows that not finding time to do a HEP is a recognised barrier to adherence.^{43 45} Collaboratively discussing with patients how these enablers can be included in their day could boost the chances of adherence to the HEP.

Research implications

This research is intended to improve clinicians' understanding of patient support needs and inform the development of self-management interventions. Specifically, our findings highlight the need for a strong therapeutic relationship and to train HCPs in educating patients about patients' misconceptions about the condition and the role of rehabilitative exercises. Clinicians should also be trained to identify BCTs relevant to individual patients, which can be used to support adherence to conservative management of RCRSP.

Strengths and limitations

This study is the first to use TDF and COM-B to explore the barriers and enablers to shoulder rehabilitation exercise in people with RCRSP. Using the TDF and COM-B

during the analysis stage is a strength of this study as it helped to link findings to recognised BCTs relevant to supporting patients to engage with exercise. As no new themes were identified from the interviews, the richness of the data and the overlapping themes offer some confirmation of the conclusions. These data add to the knowledge base in this area and will be useful for future research and intervention development.

All of the participants in this study were white, and the majority were retired, which potentially limits the generalisability of findings to a broader population. This highlights the need for greater diversity and inclusion in health research.

CONCLUSION

People with RCRSP were interviewed to explore the barriers and enablers to doing physiotherapy-prescribed shoulder exercises. Findings support the need for HCPs to build a therapeutic alliance with patients and provide education on the current evidence about the condition by following the UK National Institute for Health and Care Excellence guidelines for shoulder pain management.⁴⁶ This recommends that clinicians communicate the diagnosis, prognosis and any uncertainties about the condition to patients and check their comprehension of the information. Conversations with patients to support shared decision-making should capitalise on the evidence showing a lack of superiority in surgery compared with conservative management. In addition, BCTs, such as demonstrating the exercises to patients and collaboratively supporting patients to incorporate the exercises into their day, are recognised as enablers. These findings will be used to develop an intervention to enhance adherence to shoulder rehabilitation exercises.

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