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Physical therapists' perceptions and use of exercise in the management of subacromial shoulder impingement syndrome: a focus group study

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1 **Physical therapists' perceptions and use of exercise in the management of subacromial**
2 **shoulder impingement syndrome: a focus group study**

3

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19

20 ABSTRACT

21 **Background:** Shoulder pain resulting from subacromial impingement syndrome
22 (SAIS) is a common problem with a relatively poor response to treatment. There is little
23 research exploring physical therapists' perspectives on the management of the syndrome.

24 **Objectives:** To investigate physical therapists' perceptions and experiences regarding
25 the use of exercise in the treatment of patients with SAIS.

26 **Design:** Qualitative focus group study.

27 **Methods:** Three 60–90 minute focus group sessions containing 6–8 experienced
28 musculoskeletal physical therapists (total $n=20$) were conducted. Thematic content analysis
29 was used to analyse transcripts and develop core themes and categories.

30 **Results:** Exercise was seen as key in the treatment of SAIS. The overarching theme
31 was the need to “gain buy-in to exercise” at an early stage. The main subtheme was patient
32 education. Therapists identified the need to use education about SAIS etiology to foster buy-
33 in and “sell” self-management through exercise to the patient. They consistently mentioned
34 achieving education and buy-in using visual tools, postural advice and sometimes a “quick
35 fix” of pain control. Furthermore, experienced practitioners reported including educational
36 interventions much earlier in treatment than when they first qualified. Therapists emphasized
37 the need for individually tailored exercises including: scapular stabilization; rotator cuff,
38 lower trapezius and serratus anterior strengthening; and anterior shoulder and pectoralis
39 minor stretching. Quality of exercise performance was deemed more important than the
40 number of repetitions that the patient performed.

41 **Conclusion:** Experienced musculoskeletal physical therapists believe that exercise is
42 central in managing patients with SAIS, and that gaining patient buy-in to its importance,
43 patient education, promoting self-management, and postural advice are central to the
44 successful management of people with SAIS.

45 **Word count 5721**

46 INTRODUCTION

47 **Physical therapy, in particular therapeutic exercise is a common first choice treatment**
48 **for subacromial impingement syndrome (SAIS),¹ however, the benefits of physical**
49 **therapy exercises and their optimal clinical application remain unclear. This**
50 **uncertainty is reflected not only in the wide range of approaches and exercise**
51 **interventions used for SAIS but also in the subjectivity of their application.^{2,3}**

52 Consequently, the long term outcome of conservative management of shoulder pain is
53 reported to be poor.^{4,5}

54

55 Exercise is used as a treatment modality in SAIS to relieve pain, reduce muscle spasm,
56 promote tendon healing, reverse abnormal force-couple imbalances, restore pain-free joint
57 range of motion, and ultimately improve function.⁶ However, physical therapists remain
58 uncertain about the optimal exercise prescription regimen, i.e. which muscles should be
59 targeted, and how they should be strengthened with respect to mode, frequency, duration,
60 intensity and progression of shoulder exercise interventions.

61

62 The lack of standardized clinical guidelines for the management of SAIS has prompted the
63 development of a number of evidence-based exercise protocols based on reviews of the
64 literature.⁷⁻¹⁶ Kuhn,¹¹ for example, suggested a standardized exercise protocol based on the
65 findings from 10 randomized controlled trials (RCTs). However, it is not evident which types
66 of exercise were best supported by the literature and the suggested rehabilitation program
67 appears to be a pragmatic, informal amalgamation of the reviewed trials' interventions. In a
68 recent systematic review and meta-analysis of 16 RCTs, Hanratty et al¹³ concluded that while
69 exercise was effective at reducing pain and improving function at both short- and longer-term

70 follow-up, heterogeneity in the description and content of the exercise protocols prevented
71 the development of specific exercise protocols for SAIS.

72 An RCT by Holmgren et al¹⁴ investigated a shoulder-specific loaded (i.e. with resistance)
73 exercise plan versus a control exercise plan of nonspecific, unloaded movement exercises for
74 the neck and shoulder in 102 patients. This study concluded that rotator cuff eccentric
75 strengthening exercises and eccentric/concentric exercises for the scapular stabilizers reduced
76 the need for arthroscopic subacromial decompression at 3-month follow-up by 2/3rds (63% in
77 control group versus 20% in intervention group, $p < 0.001$). The authors stated that the exercise
78 intervention used was developed with a combination of their clinical experience and latest
79 scientific evidence.^{10,14-16} **It is, however, unclear how the clinical component was**
80 **established.** While some surveys, **systematic reviews and RCTS** have been published
81 regarding the use of physical therapy treatments for the management of SAIS,^{2,3} there has been
82 no published research **that we are aware of that uses** a rigorous research method to explore
83 expert *clinical experience* and *therapists' perceptions* regarding the selection and effectiveness
84 of exercises for patients with this condition. **Furthermore, while the American Physical**
85 **Therapy Association (APTA) Orthopedic Section have published guidelines relating to**
86 **adhesive capsulitis,¹⁷ there are no guidelines relating to the management of SAIS.**

87

88 In summary, a number of pragmatically developed protocols are available for the treatment of
89 SAIS. Some have originated from poorly designed studies that have a high risk of bias.¹³ In
90 addition, while all have a subjective component, we have not been able to find any published
91 research that explores practicing therapists' perceptions regarding the use and effectiveness of
92 exercises in the treatment of SAIS. **It is therefore unclear why or how the exercises included**
93 **in the protocols were selected. Previous work by this research team¹³ neither revealed**
94 **which exercises were best supported by the evidence, nor provided enough data to inform**

95 **physical therapists as to their dose, duration, or intensity. Consequently, this study sought**
96 **to formally examine therapist perceptions and opinions of exercise management of SAIS**
97 **with a view to combining these with the results of a literature review,¹³ in order to inform**
98 **the development an evidence-based exercise protocol for SAIS.** The aims of this research,
99 therefore, were to investigate two issues: first, physical therapists' perceptions regarding the
100 use and types of exercise commonly employed in the management of SAIS, and second, their
101 views on the appropriate choice and dosage of such exercises.

102

103 **METHODS**

104

105 **Approach and design**

106 **Focus groups and thematic content analysis were used to assess physical therapists'**
107 **perceptions and experiences regarding the use of exercise in the treatment of patients**
108 **with SAIS.**

109

110 **Participant recruitment**

111 Participants were identified using purposive sampling techniques to ensure the selection of
112 therapists with the relevant experience and expertise. Potential participants were identified by
113 contacting the managers of physical therapy departments and outpatient departments with the
114 goal of recruiting physical therapists meeting the following inclusion criteria:

- 115 • Having more than 5 years' postgraduate experience working with musculoskeletal
116 conditions.
- 117 • Working, on a daily basis, in a musculoskeletal role.
- 118 • Willing to attend focus groups and consent to be audio- and video recorded.

119 Two large hospital trusts in Northern Ireland (comprising 10 hospitals) and four hospitals and
120 a large private practice in the Republic of Ireland were approached. This resulted in three
121 focus groups, consisting of 6–8 physical therapists, being conducted in hospitals within the
122 UK and Ireland.

123

124 **Setting**

125 The focus groups took place within the Belfast and Northern Health and Social Care Trusts in
126 Northern Ireland and at a central location in Dublin, where therapists from three
127 hospitals/clinics convened. In some instances it was possible to recruit specialized upper limb
128 physical therapists; however, in some hospitals such practitioners did not exist.

129 **Data collection**

130 An experienced focus group facilitator (MMcC), who was not a physical therapist and was
131 thereby considered to be unbiased, the main researcher (CH), and another member of the
132 research team (JMcV or DK) were present at each focus group. The focus group interviews
133 and discussions were recorded on video- and audiotapes, which were then transcribed
134 verbatim. Field notes were also taken.

135

136 Each group session began with a review of the study's aims and an explanation of the
137 procedure by the facilitator. A semi-structured format was used, utilizing the question
138 schedule outlined in Table 1, with encouragement for the participants to digress and fully
139 explain or introduce new ideas and thoughts. When all key issues had been fully discussed
140 and probed and no additional ones had been raised, the facilitator orally summarized the
141 views expressed by the group. The participants were asked to endorse these points and add
142 any other views not previously discussed. The focus group was terminated when the
143 participants could not add anything further to the discussion. A written summary of the
144 relevant focus group was posted to each participant.^{19,20} Participants were asked to respond if
145 these summaries were inaccurate; no concerns were expressed. The transcripts were also
146 checked by the facilitator. **The research team discussed emerging themes after each focus**
147 **group. As no new insights emerged from the third focus group, it was considered that**
148 **data saturation had occurred and that no further focus groups needed to be**
149 **convened.**¹⁸⁻²⁰

150

151 **Insert Table 1 about here**

152 **Data management**

153 The main researcher (CH) audio-typed all manuscripts and compared the transcripts to the
154 video recording to ensure that therapists were identified correctly. Although anonymized, all
155 transcriptions were additionally password protected. The coded list of participants was kept
156 in a secure data storage room in Ulster University.

157

158 **Data analysis**

159 Data were analysed by means of thematic content analysis.²¹⁻²³ Whilst principally driven by
160 key *a priori* themes drawn from the literature and clinical experience within the research
161 team (e.g. ‘progression’, ‘intensity’ of exercises), the analysis was conducted to allow
162 additional themes (e.g. ‘buy-in’, ‘quick fixes’) to emerge inductively from the data. These
163 approaches correspond, respectively, to the ‘directed’ and ‘conventional’ forms of content
164 analysis described by Hsieh and Shannon.²²

165

166 Details from field notes and recordings were used for analysis in conjunction with the
167 transcribed script. Five members of the research team independently read and re-read the
168 transcripts to allow immersion in the data. Notes on broad content headings were made,
169 followed by open coding of data. A consensus meeting was held to discuss each researcher’s
170 analysis, which also enabled agreement on key categories developed within each theme. One
171 researcher (CH) then created categories and sub-categories composed of common content,
172 and repetitious and similar headings were combined by re-reading the transcripts.¹⁸

173 Quotations within each category were grouped together. A second consensus meeting was
174 held, in which the researchers discussed a hierarchy of overarching themes, categories and
175 sub-categories.

176

177

178 **Maintenance of rigor**

179 **The credibility, dependability and transferability of the current findings were enhanced**
180 **by the use of a number of recommended strategies.^{18,19,22,23} Two of the focus groups**
181 **covered a large geographical area of Northern Ireland and included therapists from**
182 **rural and urban areas, working in both private and public sector thereby enhancing the**
183 **transferability of the studies' findings. Therapists had postgraduate experience ranging**
184 **from five years to over 30 years. Such experience should contribute to the credibility**
185 **and dependability of the data.**

186

187 **The questioning schedule was developed by the research team after reflecting on the**
188 **gaps within existing literature,¹³ increasing its dependability and familiarizing the team**
189 **with the research objectives. Developing the questioning schedule also increased**
190 **credibility as the brainstorming and consensus method limit the influence of the**
191 **possible biases of any one researcher. The content of the questioning schedule was**
192 **reviewed after the first focus group.**

193

194 **Credibility was ensured during the data collection period by using an experienced but**
195 **non-therapist qualitative researcher as the facilitator. Dependability was enhanced as**
196 **data were monitored and interpreted by the team as they were collected. The focus**
197 **groups were videotaped, audiotaped and transcribed verbatim and non-verbal data**
198 **were inputted into the transcript. Participants were provided with a written summary**
199 **of their focus group's discussion for verification or member checking.^{19, 20} The**
200 **credibility and dependability of the coding was ensured by an initial round of**
201 **independent coding by each researcher, followed by a consensus meeting where**

202 **emerging themes were discussed at length. The main researcher (CH) then compiled a**
203 **hierarchy of themes based on this discussion, after which a second consensus meeting**
204 **took place where researchers' findings were synthesized.¹⁸ Disagreements in the**
205 **interpretation of the data were debated and discussed until a consensus emerged. Figure**
206 **1 summarizes the strategies used to maintain rigor throughout each stage of the study.**

207 **Insert Figure 1 about here**

208

209 **Ethical conduct and protection of participants**

210 The study was approved by the Ulster University Research Ethics Committee and the Office
211 for Research Ethics Committee, Northern Ireland (ORECNI Ref: 11/NI/0026). All
212 participants gave written informed consent. All data were anonymized and participants were
213 referred to as: PT01, PT02 etc.

214

215

216

217

218

219 RESULTS

220 Participants

221 A total of 20 physical therapists (18 female, 2 male) **specializing in musculoskeletal**
222 **practice and having at least 5 years postgraduate experience were recruited.**
223 **Additionally all had completed formal post-graduate training in manual therapy.**
224 Therapists worked in the NHS and private practice musculoskeletal out-patient departments
225 ($n= 15$), as well as orthopedics ($n=3$), rheumatology ($n=1$) and sports medicine ($n=1$) clinics.
226 Each focus group contained 6–8 participants and lasted 60–90 minutes.

227

228 Commonly occurring themes and categories are summarized in Figure 2.

229

230 **Insert Figure 2 about here.**

231

232 **Overarching Theme: “Buy-In”**

233 The main theme that emerged from the focus groups was that gaining buy-in from patients
234 that physical therapy treatment, in particular to exercise, was essential. This concept was
235 specifically mentioned on 21 occasions across all three focus groups. Furthermore, this theme
236 permeated discussions on patient education, visual tools, the patient’s desire for a quick fix,
237 practitioner experience, and changing pain levels; it was therefore viewed as an overarching
238 theme.

239

240 Specific discussions centered on the necessity for gaining buy-in at an early stage of
241 treatment, as mentioned by PT15: *“Unfortunately it’s [managing SAIS] not a quick fix and it*
242 *takes a long time and is very progressive...so you have to really sell it early.”*

243 The therapists agreed that exercise was important because of the function of the shoulder and
244 the interplay between the rotator cuff, scapular stability and normal joint kinematics:

PT13 I think it's [exercise] the key... if we want to get any long-term resolution of symptoms
exercise would be the mainstay of the program... if you don't address it with exercise you
are not likely to win.

245 Therapists also identified exercise as being important for those with severe pain and limited
246 movement.

PT02 I agree there with [PT03], commonly you find that obviously the patient is very sore
and doesn't want to move and that makes it worse, they develop secondary problems.
So you've gotta really emphasize exercise and starting to move it [the shoulder].

247

248 **Patient education**

249 There was general consensus that early patient education was the best way to successfully
250 achieve buy-in:

251

PT01 ...I think the key thing is good education right at the start, more than even the specifics of
exercise. I think if they are well educated that they can actually grasp it and clue into what
you want to do.

252 Under the theme of 'patient education' the therapists discussed why and how they educated
253 their patients. They also discussed who applied education at different stages of treatment,
254 comparing novice practitioners with those with more post-graduate experience.

255

256

257 *The need for patient education*

258 It was apparent that patient education was considered essential to promote buy-in to exercise
259 and longer-term self-management:

260

261 PT05 ...If you have [patients] well educated and you've shown them where it's happening,
262 why it's happening, then they tend to take on board what you're saying...

263

264 PT10 ...it's trying to get them to understand that unless you resolve the other issues, the
265 postural issues or a muscle imbalance, that it's just going to happen all over again.

266

267 It was clear that the therapists wanted to encourage patients to take responsibility for
268 management:

269

PT05 ... so you're putting the onus back on them [the patient] to be proactive... to allow
the patient to self-manage, that exercise is the key....

270

271 Therapists also discussed and shared methods and phrases used in combination with exercise
272 therapy to foster self-management, buy-in and compliance, as the following excerpt from one
273 of the focus groups illustrates.

274

PT06 ...I think, for people that are not complying with their exercise, I think you just
have to lay the cards on the table and say "look, there's no point you coming here."

PT09 I basically tell my patients, "look I'm not giving you these for no reason, it's your
responsibility to do these; it's your shoulder."

PT07 Whenever a patient says I'm too busy... I gently say to them "well by choosing not to put this as your top priority you are choosing to live with this ... but by doing that you are de-prioritizing this, but that's your choice, it's up to you."

275 Participants also identified two patient types with respect to buying in to exercise:

PT20 ...you have two sets of patients, some of them are highly motivated and do whatever it takes and then [for some patients] you have to sell into it [to them] and say "this is your injury and this is your program", so there are ones that want the quick fix and there are ones that know they have to do the work.

276

277 The therapists also stated that passivity on the part of the patient was a reason for a lack of
278 buy-in and unsuccessful long-term self-management:

279

PT05 There's no point in us wasting our time if they're not going to be compliant, so you're putting, again, the onus back on them to be proactive.

280

281 *Achieving patient education*

282 Patient education for long-term self-management was reported to focus on the use of visual
283 tools to explain the pathology underlying subacromial impingement, and on the importance
284 of postural education.

285

286 The use of visual tools to reinforce education was mentioned by nearly half (9/20) of the
287 participants, with several others agreeing non-verbally with the statements being made. In

288 particular, mirrors and skeleton models were mentioned as aids used to explain the causes of
289 subacromial impingement and to encourage patient buy-in to exercise.

PT03 ... if we show them on a skeleton they can actually relate how small that space is
between the acromion and the humeral head, and if there is any enlargement say in
the tendon and that space is closed down... then they take it on board.

290

291 It was interesting that the video function on patients' mobile phones was used as an
292 educational aid and as a teaching tool to remind patients of the correct exercise technique:

PT16 I started videoing exercises that patients are doing on their phone... it's a lot
quicker than writing down and using PhysioTools [a computer program that
produces exercise diagrams].

293

294 The need for education regarding the role of poor posture and how it can be linked to
295 subacromial impingement was felt to be particularly important. One therapist mentioned that
296 there is a typical posture to be seen in patients with this condition:

PT09 ...I would be looking at posture... typically with a shoulder impingement... the
shoulder tends to sit very far forward and they tend to have tight pecs [pectoral
muscles] at the front of the chest and very long and stretched scapular muscles and
[a] weak rotator cuff.

297 As a group, participants agreed with this and also discussed the importance of initiating
298 postural education early in treatment to gain buy-in, to help patients to understand their
299 problem, to build a better foundation for further exercise, and to assist in long-term self-
300 management:

PT18 ...you can do some very good exercise in retaining good posture and then putting quality movement then on top of quality posture, which is what I think the shoulder really needs on a regular basis.

301 Lastly, the therapists mentioned how providing short-term pain relief, as a quick fix, helped
302 to educate the patient about the longer-term effects of exercise and to gain buy-in from the
303 start of treatment. This essentially demonstrates the longer-term outcomes if patients engage
304 in the program:

305

PT13 ... I think it's important that there is some buy-in from the patient... You can get buy-in if you give them immediate pain relief.

306 They mentioned ways in which they gave this pain relief:

307

PT01 ... I think you have to engage the patient to let them see by doing things... by moving their humeral head, by readjusting the position of their scapula, by simply trying to get them to correct their posture... to see can this change their pain?... that they can feel some kind of difference, well then it's going to be sold to them easier.

308 Even though therapists were reluctant to give a passive quick fix to patients, they may do
309 something that temporarily mimics the long-term results of exercise, like taping of the
310 shoulder blade, to encourage buy-in to the exercise treatment:

311

312 PT10 ...show them that they can get some relief of pain... I would also do the scapular
313 work and strapping and to show them that it will improve... it is giving them short-
314 term relief but it's also getting them on board.

315

316 PT06 ... if you realign and hold their scapula down if there's weakness there and they can
317 move without a painful arc, and if they have a painful arc and you get them to push
318 their arm down to engage deeper muscles and the pain goes away that means exercise
319 is going to work.

320 *Who provides patient education and when?*

321 All groups noted that the background and experience of the practitioner influenced the
322 treatment delivered to a patient with SAIS. There were two facets to this belief. Firstly,
323 treatments offered to patients depended on the type and level of postgraduate training of each
324 physical therapist. Secondly, the longer physical therapists had been qualified, the less likely
325 it was that they would try to give the patient a quick fix (except temporarily to gain buy-in),
326 and the more they would educate the patient at the first session. This placed the onus on the
327 patient to buy-in to long-term self-management:

PT05 ...it can depend on what courses the physio has been on... that makes a difference.

PT18 But the difference with experience... I definitely would spend my first session
trying to get that buy-in and educating for most of it.

PT17 In the last 5 years since I qualified, that [buy-in] is definitely something that I have
noted that has changed a lot. Now in that first session you would spend most of
your time educating them and getting that buy-in rather than thinking "I've got to
get in there and strengthen."

328 **Exercise Prescription**

329 These findings are best highlighted in relation to the second aim of the focus groups, i.e. to
330 determine participants' views on which *types of exercises* and *exercise dosage* should be used
331 in the treatment of SAIS. There were two main categories here: types of exercise and exercise
332 dosage (Figure 3).

333

334 **Insert Figure 3 about here.**

335

336 *Types of exercise*

337 There was general consensus across all groups regarding the need for individually tailored
338 programmes. Therapists agreed that it was difficult to adopt a 'one size fits all' exercise
339 approach:

340

PT05 I think it's hard to be prescriptive... and I think we should be careful not to be
prescriptive because it depends so much on the patient...

PT12 I think we all recognize that every patient is different and we all have different
approaches.

341 Despite this acknowledgement of the individuality of both the therapist and the patient, there
342 was a consensus that exercises would start with postural 'scapular setting' exercises and that
343 pectoral tightness and overall posture should be addressed before progressing to rotator cuff
344 strengthening, core stability and proprioceptive exercises:

345

PT05 We are doing things like stretches for the front of the shoulder and a lot of strengthening work for the scapular stability; it might be on your hands and knees, it might be one arm leaning on the wall, serratus anterior strengthening work, rotator cuff, proprioceptive exercises – those would be the main ones.

PT09 ... my first emphasis... would be to see how you can get the pec [pectoral] muscles stretched out... getting them to what's called the scapular setting to set the scapula, the head of the humerus in a more normal anatomical position... or I might bring out [a very light elastic strengthening band] and tie it to a door handle and getting them to set their scapula and getting them to come back into an extension and then external light rotation resistance.

PT12 ...we all have said that we would start with scapular retractions, we would all work on rotator cuff strengthening and pec [pectoral muscle] stretches.

346

347 There was also discussion around the use of functional exercises that better integrate with the
348 patient's routine:

349

PT10 A certain part of doing your whole rehab is that it should be functional, it should be everyday activity.

PT16 ... especially if they are office-based work... pain is a great reminder of posture and impingement so if it is a scapulothoracic problem then just ensuring that they go through their work station and their chair and even things like, I tell them to get those little wrist supports for their keyboard, just making sure that their work station is ergonomically friendly. I suppose if you spent all day in an office and

you are like this [demonstrating slumped forward] just doing 10 minutes of thoracic exercises isn't going to change it. I would be thinking more of postural positions than thinking this is going to be your exercise [demonstrating shoulder flexion].

350

351 *Exercise dosage*

352 Several therapists made specific suggestions regarding the number of repetitions and sets they
353 would prescribe, and these included 3 sets of 10 repetitions (PT06) or 3 sets of 5 repetitions
354 (PT10 and PT07). One therapist (PT07) mentioned explaining to patients that “...*they start to*
355 *tire towards the end of the second set and as they finish the third they are glad that they've*
356 *finished and that they increase it as able.*” There was general agreement with this statement
357 in this focus group.

358

359 However, there were some conflicting opinions across the focus groups, with other therapists
360 arguing that it was difficult to be prescriptive because it depended on the ability of the person
361 to learn the exercise, fatigue, quality of exercise, muscle recruitment and timing:

362

PT15 It's hard to put a time on how many treatments you are going to give them because it maybe is a rotator cuff centering or scapulohumeral, it's very much per patient and it depends on their ability to learn that exercise.

363 Further, there were some general discussions about using a timed intervention, and
364 suggestions about using lower intensity/resistance – e.g. light-resistance elastic strengthening
365 band (PT06, PT16 and PT13) for rotator cuff strengthening. PT04 and PT06 reinforced this
366 by explaining that the rotator cuff muscles are “*controlling muscles*”:

367

PT05 ...in the class we do our circuit for a minute – so that’s maybe the only objective thing I can say. But maybe within that minute some will do more reps [repetitions] than somebody else – but they have a minute to do that particular exercise before moving on.

PT06 If you are strengthening your rotator cuff muscles, if there were no other barriers except for strengthening you would want high reps and low resistance for those muscles...

369 **DISCUSSION**

370 This study had two aims. The first was to determine physical therapists' perceptions of the
371 use of exercise in the management of SAIS, and the second was to determine their views on
372 the nature and the dosage of the exercises that should be included in an exercise program for
373 its treatment.

374
375 The main themes derived from the analysis of the focus groups were: the importance of
376 gaining buy-in from patients; patient education; how treatment approaches change with
377 experience; and the role that pain control plays in allowing the therapist to gain and reinforce
378 patient buy-in. Although the therapists stated that they would use exercise to promote self-
379 management and place the onus onto the patient for longer-term recovery, they also often
380 stated that they would gain buy-in by using intrinsic motivation strategies such as giving the
381 patient a quick fix of pain relief.²⁵ For example, they might use taping to simulate the effects
382 of better scapular muscle control, thus demonstrating the effectiveness of exercises and
383 reinforcing the need for long term buy-in to exercises. This approach is supported by work by
384 Sluijs et al,²⁶ who investigated the association between patient compliance with exercise
385 programs and characteristics of the patient, their illness and the therapist. These authors²⁶
386 surveyed 300 physical therapists working in musculoskeletal practice who reported that lower
387 levels of adherence were linked to patients having low opinions about the value of therapeutic
388 exercises. Brewer et al²⁷ also demonstrated that higher levels of adherence may be related to
389 positive beliefs that the exercise is effective.

390 **In attempting to gain buy-in, and promote increased awareness of self-efficacy, physical**
391 **therapists need to effect behavioural change strategies. One model commonly used in**
392 **healthcare settings is the Transtheoretical Model of Change.²⁸ Awareness of this model**
393 **highlights that change happens over time and that therapists may need to use different**

394 **strategies – e.g. education, quick fix of pain relief, promotion of self-management –**
395 **depending upon which stage the patient has reached (e.g. pre-contemplation,**
396 **contemplation, preparation). Although the therapists within this set of focus groups did**
397 **not articulate any specific behavioral change models, they discussed the use of various**
398 **strategies to gain buy-in from the patient – in effect, enabling the movement from pre-**
399 **contemplation to preparation and action stages.**

400

401 **In applying behavioural change strategies and using educational tools, such as mobile**
402 **phone technology, therapists should consider cultural and generational differences that**
403 **may affect patients’ readiness to learn and how they learn. Younger, more recently**
404 **qualified therapists described videoing patient’s exercises on their mobile phone, rather**
405 **than using more traditional paper based exercise advice sheets. While there is a**
406 **perception that older adults are more reluctant to engage with mobile health**
407 **technology, it appears that perceived usefulness and perceived ease of use are more**
408 **important determinants of acceptance.^{28,29} As always, therapists should tailor their**
409 **strategy to gain buy-in to the individual patient with due regard to their particular**
410 **personal or cultural preferences.**

411

412 Therapists in this focus group study stated that as they gained experience they recognized the
413 primacy of exercise in SAIS management. Slade et al³¹ used focus groups to investigate the
414 perceptions and experiences of Australian physical therapists who use exercise to treat
415 patients with chronic low back pain. Interestingly, some themes identified in our work reflect
416 the findings of in that study.³¹ In particular, these authors also identified that more
417 experienced therapists felt increased confidence in “selling the merits of exercise for

418 improving outcomes.” Additionally, therapists in Slade et al’s³¹ study also identified a need
419 to educate their patients about their injury and diagnosis. Rindflesch³² investigated patient
420 education provided by therapists from acute care, in-patient rehabilitation and from out-
421 patient care, using focus group discussions. His paper concluded that while the APTA did not
422 class patient education as a primary intervention, the American therapists who participated in
423 the study disagreed and did not separate patient education from other primary modalities. The
424 results of our study support the findings of Rindflesch,³² reinforcing that patient education
425 forms a crucial part of therapy and is used to empower patients and encourage optimal self-
426 management.

427

428 **Exercise Prescription Findings**

429 Conversations regarding exercise prescription were briefer and more limited than those
430 exploring the psychological issues underpinning therapy. There was a general reluctance
431 across all groups to state specific objective exercise prescription parameters. Participants in
432 the focus groups reported that, due to the individualized nature of physical therapy treatment,
433 standardized exercise prescription may not be possible. Despite this, there were some
434 common points of discussion.

435

436 The therapists stated that it was difficult to be prescriptive and that patients with SAIS needed
437 an individually tailored exercise protocol. However, certain exercises were commonly
438 mentioned; for example, anterior glenohumeral joint and pectoralis minor stretches, scapular
439 stability exercises/scapular setting, elastic strengthening bands, rotator cuff strengthening, 4-
440 point kneeling proprioceptive exercises, and functional movements. Specific muscles
441 mentioned in terms of strengthening were serratus anterior, lower trapezius and the rotator
442 cuff. Reassuringly, the scapular stability training and progressive rotator cuff strengthening

443 exercises using elastic bands described are similar to the interventions used in several well
444 conducted previously published studies.³³⁻³⁷

445

446 There was very little discussion that dealt directly with the prescription of exercise in terms
447 of intensity, frequency, duration and number of repetitions and stage of the disorder. Three
448 therapists mentioned that they directed patients to perform three sets of five or 10 repetitions
449 of each exercise; five therapists, however, disagreed with this and suggested that the focus
450 should be more on the quality of exercise and the ability of the patient to avoid fatigue. There
451 was some discussion around the usefulness of a timed intervention period in which patients
452 could perform different numbers of repetitions dependent upon individual ability. This
453 appears to be a reflection of pragmatic clinical reality as it had not been mentioned in
454 previously reviewed papers or protocols. With respect to intensity, the only aspect mentioned
455 was that the rotator cuff, as controlling muscles, should be recruited using lower-intensity
456 exercises, e.g. using light-resistance elastic strengthening bands for strengthening exercises.

457

458 Our review of 16 RCTs conducted prior to this study concluded that heterogeneity in exercise
459 parameters used, along with the variable quality of the data, prevented clarification regarding
460 the nature or duration of an optimal exercise approach in SAIS.¹³ This belief was also
461 reinforced by others who had attempted to define parameters for an evidence based
462 protocol.⁷⁻¹² The reluctance of the therapists within these focus groups to commit to specific
463 exercise parameters may further reflect this lack of a strong evidence based protocol to direct
464 treatment for SAIS.

465

466

467

468 **Study Strengths**

469 A number of qualitative methods could have been used to examine the experiences and
470 perceptions of the physical therapists, e.g. the Delphi technique, one-to-one interviews,
471 questionnaires, or a nominal group approach.^{38,39} The decision to use focus groups was based
472 upon consideration of the aims of the research, the strengths of focus group methodology, and
473 after considering the pros and cons of the other aforementioned techniques. Since there was
474 no previous research in this area, the research team decided not to use a Delphi method or
475 nominal group technique approach as an initial exploratory method as they are consensus
476 methods,³⁹ and are therefore a less suitable means of eliciting a range of perspectives.

477 Focus groups are particularly suited to exploring perceptions and lived experiences.³⁸ Their
478 use allowed the researchers to select a purposive sample of therapists and to examine, in
479 depth, issues relating to managing SAIS.²⁰ The focus groups further allowed participants to
480 reflect upon, and clarify, their views in a dynamic group context.^{38,40} They also have the
481 benefit of revealing how participants' views are developed during interactive discussion and
482 through other forms of communication, such as anecdotes, jokes, and aspects of non-verbal
483 behaviors. A varied range of information can therefore be gleaned via this method.

484

485 **Study Limitations**

486 Therapists in this study were selected by purposive sampling and were required to have had
487 at least five years postgraduate experience in treating musculoskeletal disorders. The
488 exclusion of younger, more recently qualified therapists may have altered the outcome of the
489 focus groups, particularly in relation to when and how to encourage patient buy-in, how they
490 use quick fix methods to gain buy-in, and how and why they prescribe certain exercises.

491 Furthermore, therapists were reluctant to elaborate on the exercises that they prescribe and

492 the treatment parameters used, most probably due to the difficulty in generalizing about
493 treatment interventions that are individualized by nature. This may have limited the clinical
494 utility of the study findings.¹⁸ **Furthermore, while this study crossed the borders of**
495 **Northern Ireland and the Republic of Ireland, it involved a homogeneous Northern**
496 **European population of practitioners. The findings of this study may have been**
497 **strengthened had we been able to expand the geographical area of recruitment.**

498

499 **Future Research**

500 This is the first qualitative study that the authors are aware of that has explored physical
501 therapists' perceptions of the use of exercise in the management of SAIS. Further
502 investigation of this topic with a broader sample of therapists with a stronger focus on the
503 specifics of exercise prescription would be useful. The results of these focus groups will be
504 used to develop an evidence-based exercise protocol for the management of SAIS to be tested
505 in an RCT.

506

507 **CONCLUSION**

508 This study explored the experiences and perceptions of experienced physical therapists who
509 use exercise to treat patients with SAIS. The therapists indicated that exercise was central to
510 the management of SAIS, but that gaining buy-in from patients was essential. Other
511 important interventions included patient education, postural advice and pain control. The
512 majority of participants were reluctant to describe a prescriptive regimen of exercise for those
513 with SAIS; common exercises were, however, identified, such as scapular stability exercises,
514 rotator cuff strengthening and stretches for the anterior shoulder and pectoralis minor.

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Tables and figures

Table 1: Questioning schedule for each focus group

Question	Cues
Tell us who you are and where you practice.	Asked to each participant
What do you think of the role of exercise in the management of patients with subacromial impingement?	
You've assessed someone with subacromial impingement and they have quite a lot of pain; how do you manage this patient?	If exercise isn't mentioned, bring group round to this.
Describe in detail, or feel free to demonstrate, if you can, any particular order in which you start and progress the patients' exercises.	
How do you prescribe exercise in terms of frequency, intensity, duration?	How many times per week do they encourage patients to perform their exercise programs?
How do you decide that your patient can progress to the next stage of the exercise regimen?	Explore how
Do you measure patient engagement with exercises?	Explore how
If we were developing an exercise program for patients with subacromial impingement, what specific exercises do you feel should be included?	asked to each participant
<u>Summary question</u>	
How well does that summarise what has been covered today?	
Is there anything anyone didn't get a chance to say?	

659

Figure 1. Methods to promote rigor

Continuous reflection on potential sources of bias

PREPARATION

Credibility and dependability

- Purposive sampling
- Development of questioning schedule from previous evidence-based work¹³
- Development of questioning schedule using consensus method to counteract bias of single researcher

DATA COLLECTION

Transferability

- Recruitment from large geographical area
- Recruitment from wide range of clinical settings

Credibility

- Experienced facilitator skilled in focus group management
- Facilitator not medically trained, therefore unbiased
- Facilitator ensured all participants spoke freely
- Ongoing critical review of emerging themes by entire research team

Dependability

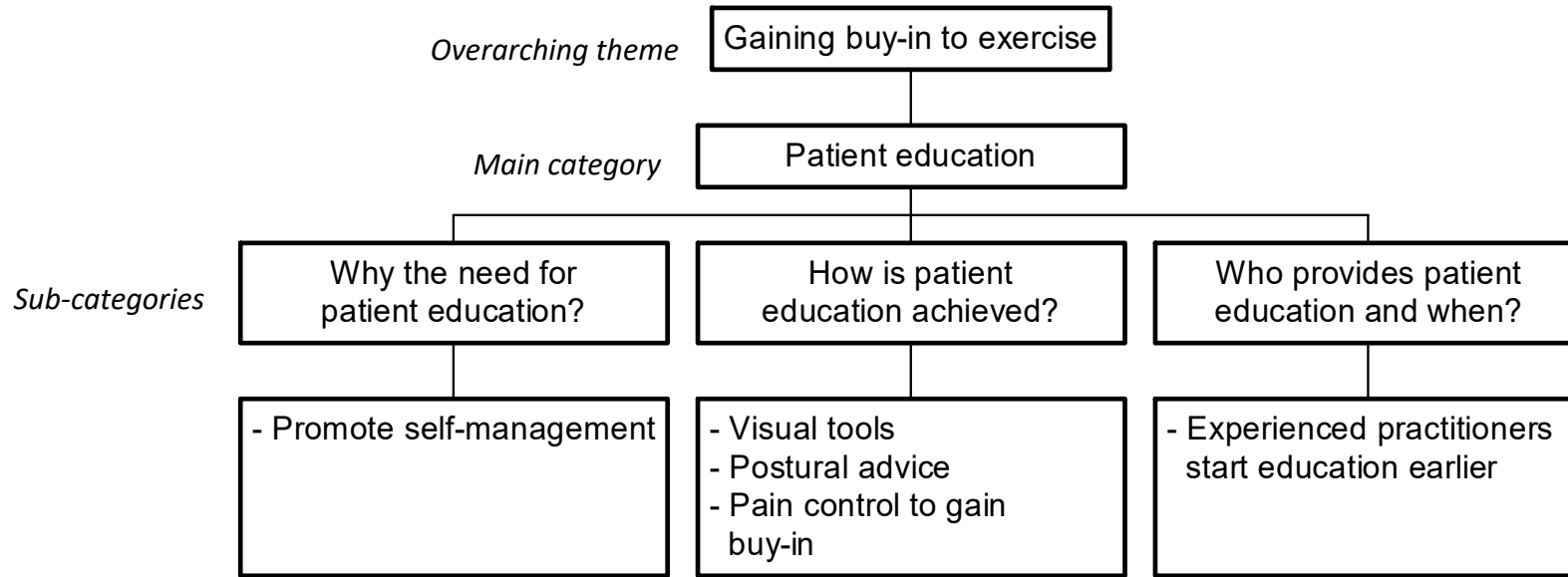
- Focus groups audio- and videotaped
- Comparison of transcriptions to recordings
- Confirmation by member checking

DATA ANALYSIS

Credibility and dependability

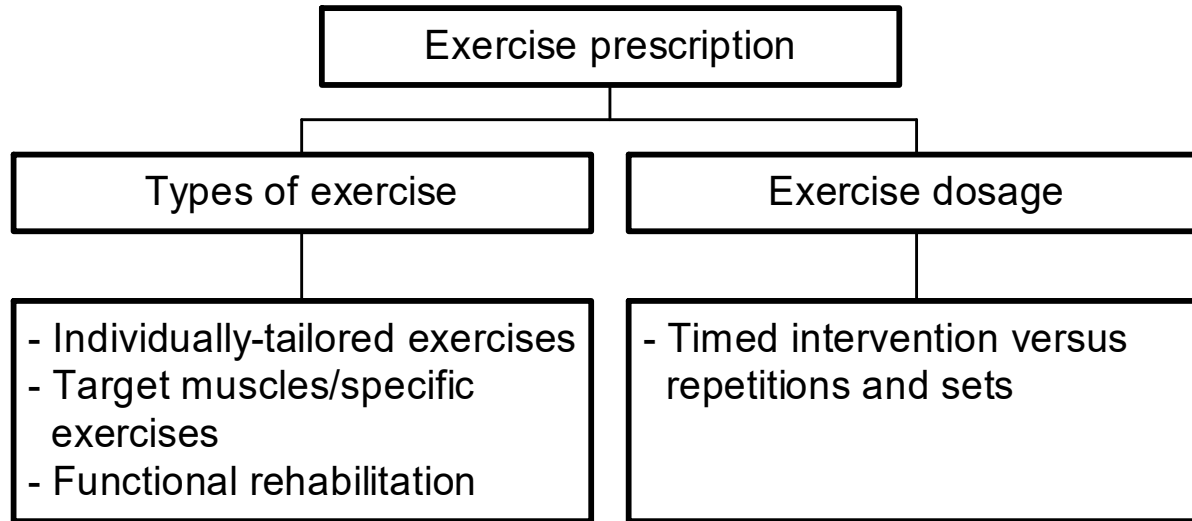
- In-depth familiarization with data
- Independent coding by research team (CH, JMcV, MMcC, DK, IW).
- Consensus meeting to discuss emerging themes at length
- Recoding
- Second consensus meeting to confirm themes
- Peer review of final themes

3 **Figure 2:** Key emerging themes and categories
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24 **Figure 3:** Key findings relating to prescription of exercise

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