

1 **Becoming confidently competent: a qualitative investigation of training in**
2 **Cognitive Functional Therapy for persistent low back pain**

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1 **Becoming confidently competent: a qualitative investigation of training in**

2 **Cognitive Functional Therapy for persistent low back pain**

3 **Background:** Physiotherapists trained to deliver biopsychosocial interventions for
4 complex musculoskeletal pain problems often report difficulties in confidence and
5 competency at the end of training. Cognitive Functional Therapy (CFT) is an
6 individualized biopsychosocial intervention and understanding the facilitators and
7 barriers to training in CFT will help inform future training programs. This study aimed
8 to explore physiotherapists' and trainers' perceptions of the process of developing
9 competency in CFT.

10 **Methods:** A cross-sectional qualitative design using interviews of 18 physiotherapists
11 and two trainers investigated training in CFT for persistent LBP via reflexive thematic
12 analysis.

13 **Results:** Physiotherapists reported undergoing a complex behavior change process
14 during training. Four themes emerged: Pre-training factors, Behavior change process,
15 Physiotherapy culture and context, and Confident competence and beyond. Key
16 components included graduated practice exposure linked to experiential learning with
17 feedback and clear competency guidelines. Pre-training and contextual factors were
18 facilitators or barriers depending on the individual. Physiotherapists supported ongoing
19 learning, even after competency was achieved.

20 **Conclusions:** This study provides insight into the processes of change during progress
21 towards competency in CFT. It highlights facilitators and barriers to competency
22 including physiotherapy culture and the clinical environment. The study also describes
23 important educational components, including experiential learning and clinical
24 integration, which may be used to inform future post-graduate training.

25 **Keywords:** biopsychosocial, physiotherapist, training, competency, qualitative

INTRODUCTION

1
2 Disability and associated healthcare costs caused by persistent lower back pain (LBP) have
3 dramatically increased over the past 30 years (Dagenais, Caro and Haldeman, 2008; Vos et al,
4 2015). Purely biomedical approaches have failed to adequately address persistent LBP. Current
5 guidelines now recommend a multidimensional biopsychosocial approach due to the
6 significant influence of psychological, social, and behavioral factors on an individual's pain
7 and disability (Bekkering et al, 2003; Glattacker, Heyduck and Meffert, 2012; Keefe et al,
8 2004; Koes et al, 2010; Nicholas and George, 2011; Nijs et al, 2013). Cognitive Functional
9 Therapy (CFT) is an emerging physiotherapist-led biopsychosocial treatment that has shown
10 promising results in the treatment of musculoskeletal pain conditions compared with other
11 biopsychosocial physiotherapy approaches (Guerrero, Maujean, Campbell and Sterling, 2018).
12 As an individualized treatment approach, CFT aims to coach patients with persistent LBP
13 towards self-management of their condition through: reconceptualizing their pain towards a
14 biopsychosocial perspective, developing confidence to engage in valued functional activities,
15 and adopting healthy lifestyle behaviors (Caneiro et al, 2017; O'Sullivan et al, 2018; Vibe
16 Fersum et al, 2013).

17
18 Competency to deliver CFT effectively requires person-centered communication, exploring
19 and addressing physical, lifestyle, psychological and social barriers to recovery (O'Sullivan et
20 al, 2018). Physiotherapists traditionally have been trained in a biomedical approach to
21 healthcare with a focus on physical impairments (Driver, Oprescu and Lovell, 2020; Foster and
22 Delitto, 2011; Synnott et al, 2015; Zangoni and Thomson, 2017). Reviews have highlighted
23 that physiotherapists often lack confidence when addressing the psychological domain of an
24 individual's pain experience (Synnott et al, 2015), even after a biopsychosocial training
25 program (Holopainen et al, 2020). Training physiotherapists to deliver CFT requires a

1 significant change in clinical behaviors and professional identity (Cowell et al, 2019). Training
2 in CFT includes exposure to new experiences and clinical situations that transform skills,
3 behavior, and the way physiotherapists view their role (Daley and Cervero, 2016; Holopainen
4 et al, 2020) and so, is a form of transformative learning. No previous studies have explored
5 processes of learning in a comprehensive CFT training program that also included a formal
6 competency assessment.

7 Understanding the pathway, processes, barriers, and facilitators involved to develop
8 physiotherapists' competency in delivering biopsychosocial interventions such as CFT is
9 important to inform future training (Baker et al, 2010; Grimshaw et al, 2012). This study aimed
10 to explore physiotherapists' and trainers' perceptions of the facilitators and barriers to learning
11 and behavior change for physiotherapists undergoing training to achieve competency in CFT.

12

13 METHODS

14 Design

15 We used a phenomenologically oriented qualitative study design. Our ontological approach
16 was critical realist (Bhaskar, 2004; Gorski, 2013) and our epistemological underpinning was
17 contextualism (Tebes, 2005). A qualitative research approach allows for rich exploration of
18 experiences and meaning (Denzin and Lincoln, 2017; Tong, Sainsbury and Craig, 2007). We
19 nested the study within a multi-center randomized controlled trial (RESTORE) conducted in
20 Perth and Sydney (Australia) (Kent et al, 2019). This study was approved by Curtin University
21 Ethics Committee (HRE2018-0062).

22 Participants

23 The clinical experience of the physiotherapists involved in the trial ranged from 3 to 25 years.
24 Eleven were male and seven were female. Before training, all the physiotherapists stated that
25 they tried to incorporate a biopsychosocial approach when treating patients with disabling LBP.

1 However, they felt they lacked skills, which motivated them to join the training program. We
2 invited to participate all 18 physiotherapists who had achieved competency to deliver CFT.
3 They agreed to participate and provided written informed consent. Both trainers were Specialist
4 Musculoskeletal Physiotherapists with 34 and 17 years of clinical experience respectively.

5 Intervention, training, and competency

6 The CFT intervention is a physiotherapist-led individualized biopsychosocial approach to
7 treating people with persistent disabling LBP. It aims to identify and target unhelpful beliefs,
8 emotions, and behaviors that act as barriers to recovery and to train patients towards self-
9 management. The training program we used had evolved through an iterative process of trialing
10 different ways of facilitating behavior change in physiotherapists in previous CFT training,
11 focusing on transformative and experiential learning processes through workshops and practice
12 (Bérubé et al, 2017). We describe the training in Figure 1 and competency checklist domains
13 in Supplementary Material 1.

14 Data collection

15 The first author, a clinical physiotherapist and PhD candidate, conducted all the interviews.
16 She had no training or prior exposure to CFT and had no relationship with any of the
17 participating physiotherapists before the study or the commencement of interviews. We
18 developed a semi-structured interview guide (Supplementary Material 2) based on previous
19 research of difficulties that physiotherapists reported with learning and using a biopsychosocial
20 approach (Kallio, Pietilä, Johnson and Kangasniemi, 2016). We held interviews in-person for
21 the Perth-based physiotherapists and the trainers. For the Sydney physiotherapists, we
22 conducted interviews via Skype (Microsoft, 2018) to ensure conversational nuances could still
23 be relayed and rapport built (Gray, Wong-Wylie, Rempel and Cook, 2020). We conducted
24 interviews in an iterative way, whereby new findings were investigated further in subsequent
25 interviews. There were no repeat interviews. Being a physiotherapist, the interviewer had a

1 level of shared meaning with the participants, which was evident in non-verbal communication,
2 such as nodding or not needing explanations for common acronyms during interviews Also,
3 she was not part of the training team, which facilitated the participants to open up about their
4 experiences. We recorded audio data using an electronic voice recorder. Interviews ranged
5 from 45 minutes to 1 hour 48 minutes. We interviewed 18 physiotherapists within 1 month of
6 achieving competency and trainers immediately after all the physiotherapists.

7 Data processing

8 We transcribed the data verbatim from the audio files using Temi (Rev.com, Austin TX, USA)
9 and NVIVO Transcription (QSR International Pty Ltd, 2019). We entered, anonymized and
10 analysed these data in MAXQDA (VERBI Software, 2020).

11 Data analysis

12 To gain insights into the learning process from both trainer and physiotherapist perspectives,
13 we studied the transcripts using reflexive thematic analysis (Clarke and Braun, 2016). This
14 approach allows for a rich description and analysis of patterns of meaning within the data
15 (Braun and Clarke, 2006, 2019). We used an inductive approach, without applying any prior
16 themes or frameworks to the data (Braun and Clarke, 2006, 2019).

17 We became familiar with the initial data via reading and making notes on the content of the
18 data, key metaphors and language used (Braun and Clarke, 2006). We subsequently coded
19 these data, grouped them into categories and generated initial themes (Braun and Clarke, 2006).
20 Refinement and naming of themes occurred in an iterative way as new patterns in the data
21 emerged. The first author coded the entire dataset, as reflexive thematic analysis foregrounds
22 researcher subjectivity, where understanding and meaning-making occur within the reflexive
23 lens of a single person (Braun and Clarke, 2019). A co-author (RH) collaborated on two
24 transcripts at the beginning of coding to expand the lens of the meaning-making of the coding,

1 rather than confirm the coding. All research team members read the themes, subthemes, codes
2 and associated quotes before discussing and finalizing the themes (Connelly, 2016).

3 RESULTS

4 The overarching theme was 'learning as a process', which was likened to that of a learner driver
5 (Fig. 2). The participating physiotherapists first gained foundational CFT knowledge and skills
6 supported by a 'driver's' manual. We followed with a 'tandem driver' learning process where
7 the trainer stepped in as needed. As the physiotherapist's skill and confidence progressed, the
8 trainer's support was removed until the 'learner driver' was confidently driving independently.

9 *PT5: You start off, [trainer] just treating patients and then you treat them and then*
10 *you sort of get [trainer] to jump in when you're stuck and that slowly becomes less*
11 *and less and less.*

12 We explain themes and subthemes below and depict them in Figure 2. We anonymized the
13 quotes (PT for physiotherapist and T for trainer). Supplementary Material 3 contains further
14 quotes to illustrate the results.

16 1. Pre-training factors

17 Reflections on the training process highlighted that the physiotherapists brought various 'pre-
18 training' factors to the CFT training and those factors formed the foundation of their learning
19 journey.

20 1.1 Physiotherapists' attributes

21 The physiotherapists' attributes were considered significant in facilitating the change in
22 mindset and behavior toward competency. Willingness to shift beliefs was seen as an important
23 factor when learning CFT by both trainers and physiotherapists alike. Shifting beliefs was seen
24 to require cognitive flexibility and a growth mindset to self-evaluate and change.

1 *PT7: There were definitely different levels of growth and I think that it really depends*
2 *on your own beliefs, and your own willingness to learn and change and confront your*
3 *own beliefs.*

4
5 The physiotherapists and trainers felt those who were able to self-reflect and accept feedback
6 were quicker to develop competency. Being empathetic, understanding, and compassionate
7 towards patients were seen as fundamental and many physiotherapists felt that these factors
8 determined whether someone could learn CFT. Ability to communicate, curiosity, and
9 openness were seen as skills and attributes that also helped in learning CFT.

10 The trainers felt that the older physiotherapists had a more difficult journey when trying to rely
11 less on their existing ‘toolbox’ and approach patients from a biopsychosocial perspective.

12 *T2: I think unlearning is harder than learning... Because it's almost like they had a*
13 *toolbox, which they couldn't use, and they were asked to develop a new skillset. And*
14 *when you have been practicing for many years doing one thing it's pretty hard to then*
15 *adapt that.*

16 The more experienced physiotherapists highlighted life experiences as helpful to authentically
17 understanding patients’ psychosocial issues. One physiotherapist felt that the clinical context,
18 not physiotherapist attributes, determined who could learn CFT.

19 *PT14: I don't think it's a knowledge or a skill thing. I think anyone can learn what*
20 *we've learned and be good enough to do it. I think just time is the biggest hurdle.*

21 22 1.2 Previous beliefs, practice, and skills

23 The physiotherapists all reported a lack of confidence in dealing with individuals’ psychosocial
24 factors prior to the training. The physiotherapists had felt stressed, uncomfortable,

1 overwhelmed, and worried about time management, when psychosocial issues had arisen
2 previously and therefore they avoided asking patients about them.

3 *PT11: Stress or anxiety external to their back, I didn't know how to synthesize that*
4 *information into their pain story. So, it made me uncomfortable. And because I didn't*
5 *see the use of it, I probably wouldn't ask it. And then if I did get it, I wouldn't know what*
6 *to do with it anyway.*

7 The physiotherapists felt that their previous training did not equip them to successfully
8 integrate a biopsychosocial approach with patients. Those who were recent graduate
9 physiotherapists were aware of the biopsychosocial model from their university education but
10 reported they did not know how to integrate and individualize this model into a structured
11 treatment approach. Some of the more experienced physiotherapists had only been taught a
12 biomedical approach during their previous training and felt that CFT was a contrasting
13 perspective. The physiotherapists who had completed post-graduate training courses felt these
14 had not prepared them to treat using a holistic biopsychosocial approach.

15 Upon reflection at the end of the training, many of the physiotherapists felt they had previously
16 been reinforcing fear beliefs by encouraging patients to ‘back off’ whenever they experienced
17 pain.

18 *PT12: I would have always been like, “Oh, I don't want to make you sore. Let's back*
19 *off.” And the issue with that... is that by buying into that and pulling them out, you're*
20 *reinforcing that idea that bending is bad. You buy into their fear, buy into that notion*
21 *that things are delicate and need to be protected, and shouldn't be loaded. And then*
22 *when you try to later on down the track, to get them to do those things, the fear is there.*

1 2. Behavior change process

2 The physiotherapists felt they were undergoing a challenging behavior change process as they
3 progressed towards competency that mirrored the exposure and behavior change their patients
4 underwent with CFT.

5 *PT6: I basically spoke to [trainer], and I was like, I get that you're CFT-ing us. I*
6 *understand that I just need to expose myself to it, get confident with it, tell myself it's a*
7 *good thing and then I know it's OK. I literally would apply those principles to me being*
8 *like, well, what do I do with people? I make them keep doing it, dive in, keep going.*

9 2.1 Understand, watch, practice

10 The training was framed by the trainers as a progression of ‘understand, watch, and then
11 practice’.

12 *T2: Understanding, watching, doing, are the three things. You've got to understand it,*
13 *you've got to watch it and you've got to practice it.*

14 Many of the physiotherapists felt the initial training focused on teaching the structure of CFT,
15 which allowed for understanding of its theoretical underpinnings. All the physiotherapists felt
16 they learnt about biological factors in greater depth than they had before, and for some, this
17 fostered further self-learning.

18 *PT4: They [patients] come in armed with, you know, several scans usually and they say*
19 *“I've got a disc bulge”... I'll say, “Oh, do you know that a lot of this relates to your*
20 *inflammatory levels around the disc as opposed to the actual disc bulge more often than*
21 *not, which is why it varies with x, y, z?”... That's what [trainer] said. He said it relates*
22 *to your TNF Alpha levels around the disc bulge, as opposed to the actual disc bulge. I*
23 *thought that was really cool. I actually looked up a study on that and read it afterwards.*

24 2.2 Graduated practice exposure and feedback

1 The physiotherapists and trainers felt subsequent training focused on the practical skills and
2 delivery of the approach. This involved many hours of ‘exposure’ to treating real patients in
3 front of the group for feedback. This was reported to be intimidating but very important to
4 challenging their practice.

5 *PT16: Exposure. The only way to learn is through exposure. That's what we teach our*
6 *patients and it's what we've got to do as clinicians. You've got to put yourself in a scary*
7 *situation.*

8 Being observed by the trainers whilst delivering CFT during workshops was seen by the
9 physiotherapists as fundamental for developing and fine-tuning their skills, and facilitating a
10 shift from biomedical beliefs towards a deep belief in the biopsychosocial model of pain.
11 Receiving feedback was considered imperative. The physiotherapists and trainers felt that
12 graduated practice exposure forced the physiotherapists to acknowledge their own
13 personalities, fears, strengths, and weaknesses, dismantling their previous framework of care,
14 and empowering them to change through building on their strengths.

15 Both the physiotherapists and trainers felt the feedback individualized to each physiotherapist’s
16 strengths and weaknesses using the competency checklist was very useful for developing
17 competency.

18 *PT11: [trainer] has been hard on me to really tap into emotions a lot more and I was*
19 *really slow to pick that up. So, him constantly keeping on me about that I think probably*
20 *did force more change than me just thinking about it.*

21 Most of the physiotherapists felt feedback was thorough and appreciated that as they improved,
22 the feedback tapered off. However, feedback was not always received well. Some
23 physiotherapists felt feedback delivered via the whole group was insensitive. Others wanted
24 harsher feedback, and others felt feedback was incongruent with how they had performed. As
25 a result, some disregarded feedback they did not agree with.

1 PT7: [Trainer] was like ‘you need to be more reflective’, so then I was so reflective to
2 the point I pissed the patient off. So, then I was like stuff this, I’m just gonna do it my
3 way.

4 2.3 Observation and group dynamics

5 Observing other physiotherapists deliver CFT during workshop sessions and on the recorded
6 workshop videos was considered a helpful learning experience for most of the physiotherapists.
7 They felt they learnt new ways of approaching patients, reflected on their own approach, and
8 there was a ‘collective absorption’ of phrases and expressions that helped improve
9 communication. By observing so many real patients, the physiotherapists felt they could see
10 patterns of patient presentations emerge and they learnt how to individualize their approach to
11 a broad range of patients.

12 PT6: We’ve had the whole variety, we’ve had the really high functioning, but this pain
13 is getting them down but they’re still being really active, and we’ve had the ones that
14 aren’t moving. So that’s what’s given all of us in the trial, a good range of things to
15 work with because we’ve seen a lot.

16 For most of the physiotherapists, their group was felt to be a place of safety and support. The
17 shared journey created a new community and network of physiotherapists which were
18 perceived by most to be valuable for future support.

19 PT12: Now I feel like I’ve got a bit of a network of other physios who I could refer to...
20 And because you’ve seen them treat, you’ve got confidence to say to that patient ‘I’ve
21 seen this guy treat, he’s really good.’

22 Some physiotherapists felt their group was not a positive space for critical thinking as ‘group
23 think’ mentality prevailed. Establishing a contract of engagement at the beginning of training
24 was considered important for future training by one trainer, who felt this would avoid
25 arguments and unhelpful communications.

1 T2: *One of the things I should have done right at the beginning, is to have ground rules,*
2 *to say these are the rules of engagement. This is how we're going to run this in a way*
3 *that's safe for everybody.*

4 2.4 Trainer's influence

5 The trainers were seen by the physiotherapists as masters in their field, and this meant the
6 physiotherapists were willing to take on their feedback and learn from them.

7 PT13: *I am OK with being scrutinized by someone who has mastered something I would*
8 *like to master.*

9 Observing the trainers provided a goal of exemplary management to work towards. The
10 physiotherapists were impressed and surprised by how far the trainers pushed patients during
11 exposure and behavioral experiments in workshop sessions, and observing dramatic patient
12 change was reported to have instilled confidence in the approach. Observing the trainers
13 communicate with patients in ways the physiotherapists had not seen before helped model how
14 to adopt the approach.

15 PT4: *There was a patient who said that they had a teleconference with a psychic, and*
16 *they felt really good afterwards. And I was thinking that is the most ridiculous thing.*
17 *And then [trainer] goes, "OK, so you felt better. Why do you think that helped?" As*
18 *opposed to just saying "You're an idiot." I would have laughed at that normally to be*
19 *honest. But I learnt from [trainer], he would go, "What were you feeling? What were*
20 *you focusing on? What were you doing?" He went, why did that work?... I learned a*
21 *lot from seeing that.*

22 Many of the physiotherapists reported a sense of safety, because throughout the training
23 workshops and beyond, the trainers were highly accessible through Facebook, phone calls, or
24 email. The trainers, being practicing physiotherapists, were perceived as valuable by the
25 participating physiotherapists.

1 2.5 Structured and resourced

2 Training to a structure and checklist was reported as helpful for skill development, particularly
3 during the early learning phase.

4 *PT14: It is a whole model which is nice. I know the big dogs don't like the whole*
5 *structured, they like free flowing and that kind of stuff, but it's nice when you're learning*
6 *a new skill to have some structure and format.*

7 The physiotherapists valued being able to return to the resources as needed, which encouraged
8 a level of self-learning. Resources were also sent to patients to help encourage self-
9 management, generate a conversation about a potentially uncomfortable topic, or reinforce new
10 messages and learnings from the session.

11 *PT10: Sending people resources and giving them stuff, rather than just me saying it, is*
12 *very powerful as well. Kind of the way [the trainers] are like, send them on something*
13 *relevant that they can kind of reflect on. So, you're kind of getting the ball into their*
14 *court so that they can start on that journey of getting to the point where they can start*
15 *self-managing.*

16 There were mixed reviews about the Facebook group. Some physiotherapists found it very
17 positive for accessing resources, as well as sharing and reading others' reflections on clinical
18 implementation. Others felt self-reflections were disingenuous.

19 2.6 Clinical integration

20 Practice in their clinical environment between workshop sessions was conveyed by most
21 physiotherapists as helpful for developing communication skills, knowing how hard to push
22 during exposure and behavioral experiments, and reinforcing learnings.

23 *PT11: You learn a new skill and then you need time to practice it. Then you come back*
24 *and then you implement it half as good as you should, and then you need time to*

1 *practice it. I don't think 96 hours could be done in two months say or a month or as a*
2 *really intensive course because you need time to develop.*

3 Time to practice implementing CFT between workshops was perceived as allowing for a
4 gradual enculturation of knowledge and new beliefs, which was viewed as important by the
5 physiotherapists that had come from a biomedical beliefs system. Treating real patients was
6 also viewed as very important to building confidence, as it was through being part of patient
7 transformations that physiotherapists believed in the process and became confident in the
8 process of CFT to improve patient outcomes.

9 As the physiotherapists' confidence in CFT developed, they reported implementing it with
10 patients beyond just those with LBP, which the trainers felt indicated a shift in thinking about
11 musculoskeletal care towards a biopsychosocial approach. The physiotherapists felt that
12 clinical 'failures' or interactions that did not go as well as planned were also part of the learning
13 process and helped them to improve their practice.

14 *PT14: You've got to make mistakes and then go from there. Because it's the mistakes*
15 *that you learn the most. Like the little things that you miss or things you're not that*
16 *happy with.*

17 3. Physiotherapy culture and context

18 The learning was situated within a physiotherapy culture and the clinical environment in
19 which the physiotherapists worked. Each culture and context provided challenges to their
20 learning journey.

21 3.1 Clinical environment

22 The physiotherapists felt that a supportive clinical environment with opportunities to discuss
23 ideas with colleagues and autonomy to book extra time with patients was an important
24 facilitator to learning.

1 *PT16: Part of the learning process is you probably do need a little bit more time*
2 *because you're going to make mistakes. When you pick the wrong behavioral*
3 *experiments or you push your patient slightly too far or whatever the case may be and*
4 *then their pain escalates, then you've got to spend time de-escalating their pain and*
5 *things like that.*

6 Privacy in the clinical environment was felt to be very important for exploring psychosocial
7 issues with patients. Remuneration for time spent with a patient was unresolved for many of
8 the physiotherapists. As they were generally treating for an hour or more during their learning
9 period (the trial did not pay for non-trial patients), it was difficult to charge patients adequately.

10 3.2 Physiotherapy culture

11 CFT was described by the physiotherapists as contrasting with the current culture in health
12 settings which needs fast, simple treatments, operating on dependency and financially-driven
13 models.

14 *PT9: A lot of clinics practice in a way that you are making clients a little bit more*
15 *dependent on you than they need to be, rather than encouraging self-efficacy. I think*
16 *that that fits the financial model of running a physio, a health business.*

17 The physiotherapists had received, or were anticipating, resistance from other physiotherapists
18 and health professionals, to the ideas underpinning CFT. The physiotherapists also described a
19 lack of consistency across physiotherapy, whereby patients received contradictory messages,
20 varying appointment durations, and conflicting approaches. Physiotherapy ideas which had
21 permeated into other realms of fitness and health presented clinical challenges in educating
22 other health workers.

23 *PT2: It's quite similar with a lot of health professionals, they don't believe it. I've spoken*
24 *to them. They're like, "What are you talking about, no core! What are you talking about,*
25 *rounded back!" I say, "Wait, in five years, you'll see what I'm saying."*

1 4. Confident competence and beyond

2 Achieving competency was viewed as acknowledgment of a landmark on a continuing journey,
3 not a final destination.

4 4.1 Achieving competency

5 Competency was based on each physiotherapist achieving the required competencies at their
6 own pace. The physiotherapists felt at the end of the training that they were now person-
7 centered in their whole approach. They no longer conducted subjective assessments from a
8 rigid deductive approach, and now spent time understanding each patient. They felt they had
9 learnt how to integrate the biopsychosocial elements of a person's pain experience into their
10 management.

11 *PT11: I feel like you connect a lot more with the patient and can actually make*
12 *meaningful change helping them through their life problems rather than it just being a*
13 *back pain problem, it's like how it impacts a whole life.*

14 The physiotherapists felt they now took time to listen and reflectively question their patient's
15 narratives. Previously, many had given patients the answers or lectured them. After achieving
16 competency, they encouraged patients to find their own solutions with guidance and they
17 realized this was a more effective strategy to change beliefs and behaviors. 'Rolling with
18 resistance'(Rollnick and Miller, 1995) was considered a new skill attained through training,
19 whereby physiotherapists did not directly contradict what a patient said, rather they
20 investigated further the underlying reason or belief underpinning what the patient had said.

21 The physiotherapists felt they had become confident asking psychosocial questions, providing
22 validation of their patient's experiences, and calming patients who expressed emotional
23 distress. Creating behavior change in patients was also a fundamental element in competency.

24 The physiotherapists felt that resistant patients need fewer explanations and more 'doing' in
25 behavioral experiments. When behavioral experiments did not bring change within a session,

1 the physiotherapists relied on their therapeutic alliance to get patients to stick with the new
2 ways of moving and lifestyle change for long enough that they improved. After achieving
3 competency, the physiotherapists were able to plan and structure the management of their
4 patients, they were writing significant aspects of patient views and elements of their narrative
5 in their notes, and they had a clear endpoint for their patients.

6 Many of the physiotherapists reported a shift to a more judicious approach to manual therapy.
7 Within the trial they were not able to use manual therapy. When they did use it outside of the
8 trial, they reported stating clearly to patients that they were not creating a mechanical change
9 in symptoms, but rather modulating the patient's nervous system. The physiotherapists felt
10 competent to deliver simple psychosocial advice from a physiotherapy perspective, such as
11 lifestyle change, advice on stress, sleep, and mood. However, they recognized that they were
12 not psychologists and would refer onwards if patients needed help managing psychological
13 issues.

14 *PT16: I'm not trying to be a psychologist. I'm just listening to my patient hearing that*
15 *some of these things are factors... related to their condition or a factor. Therefore, why*
16 *shouldn't I address it? I wouldn't expect a psychologist to treat a musculoskeletal*
17 *condition in the way that the physio would. But I would expect them to be able to*
18 *understand that exercise is a healthy living strategy and can help with their*
19 *psychological concerns.*

20 4.2 Improved professional confidence

21 The physiotherapists felt a greater sense of professional confidence after achieving
22 competency. They reported a sense of excitement when dealing with complex patients. As a
23 result, they were receiving more patient referrals within their practices, and felt more able to
24 confidently communicate their clinical findings and management with other healthcare
25 professionals.

1 PT9: *It's kind of strengthened my capacity to be kind of a referral source for difficult*
2 *back pain clients of my colleagues.*

3 4.3 Ongoing challenges

4 Although the physiotherapists achieved competency, they felt that practicing CFT would be a
5 continual learning process towards mastery.

6 PT16: *When you master something, it happens without you having to think too hard. I*
7 *wouldn't say that I've mastered it. I would say that I'm competent. There's a big*
8 *difference between competence and mastery.*

9 The physiotherapists reported that challenging resistant patients to make behavioral/lifestyle
10 change was still difficult. One physiotherapist felt tactfully referring patients to psychologists
11 was challenging. Managing one's own emotions during patient interactions was also reported
12 by some physiotherapists as needing conscious attention.

13 PT7: *Managing your own emotions... You need to tune into your own internal dialogue*
14 *and I think that's a skill that physios are not naturally good at because we are used to*
15 *doing, not thinking like that.*

16 DISCUSSION

17 The physiotherapists described the process of learning and achieving competency in CFT as
18 one of complex behavior change. Barriers and facilitators were individual for each
19 physiotherapist based on their personal attributes, previous beliefs, practice, and skills, as well
20 as contextual factors, including time and support within their clinical environment. Despite
21 significant barriers to the learning process, all physiotherapists achieved competency and a
22 sense of confidence to work with patients with persistent disabling LBP. This occurred at
23 different timepoints, highlighting the individual nature of this process.

24 The physiotherapists highlighted the importance of transformative learning through the
25 experiential learning components of training, feedback, self-reflection, and time for practice

1 within the clinical environment. They recognized that shifting practice to a CFT approach
2 required a paradigm shift in how they conceptualized and worked with patients with
3 persistent LBP. A ‘paradigm shift’ may be both an outcome and a process of transformative
4 learning, and has been expressed similarly by other physiotherapists training in CFT
5 (Holopainen et al, 2020), stratified care (Hsu et al, 2019), and person-centered practice
6 (Lawford et al, 2018). Furthermore, these studies reported clinicians applying this approach
7 to other patient groups with psychosocial presentations (Cowell et al, 2018; Sanders, Ong,
8 Sowden and Foster, 2014), as in our study. In contrast, implementation after training in other
9 biopsychosocial interventions has been described by physiotherapists as a ‘tool in the
10 toolbox’ (Kelly et al, 2018), a ‘mix and match’ approach (Nielsen, Keefe, Bennell and Jull,
11 2014), or ‘instinctive’ without using the complete approach (Hsu et al, 2019). Selective use of
12 components of a new approach is problematic, particularly as physiotherapists often perceive
13 they employ biopsychosocial approaches more than they do (Fritz, Söderbäck, Söderlund and
14 Sandborgh, 2018; Hsu et al, 2019).

15
16 The most influential component in transforming clinical behavior was reported to be
17 experiential learning. This involved ‘graduated practice exposure’ with feedback, involving a
18 physiotherapist undergoing trainer-supervised delivery of CFT care working with a real
19 person with LBP, in a group setting. Physiotherapists have widely reported experiential
20 learning to be fundamental to clinical behavior change (Cowell et al, 2018, 2019; Driver,
21 Lovell and Oprescu, 2020; Lawford et al, 2018; Nielsen, Keefe, Bennell and Jull, 2014;
22 Simpson et al, 2021; Synnott et al, 2016). This was echoed by our physiotherapists, who
23 likened the process of transformative learning to that of their patients, whose thoughts,
24 emotions, and behaviors are challenged through gradual exposure to feared movements
25 during CFT intervention (Caneiro, Bunzli and O’Sullivan, 2021; Caneiro et al, 2017). The

1 physiotherapists and trainers reported this process occurred as the physiotherapists began to
2 identify their own underlying pain beliefs, and challenge their previous behavioral responses
3 (such as getting a patient to lie down when pain escalated), and emotional responses
4 (including stress and fear if a patient's pain increased). Individualized feedback and self-
5 reflection allowed further transformation of beliefs and skills, as highlighted in other training
6 and behavior change literature (Donaghy and Morss, 2000; Eva et al, 2012; Fritz, Söderbäck,
7 Söderlund and Sandborgh, 2018; Lefroy, Watling, Teunissen and Brand, 2015; Winstone,
8 Nash, Parker and Rowntree, 2017). Treating patients with LBP in front of colleagues and
9 trainers was described by the physiotherapists as important but also unique. It elicited some
10 discomfort, suggesting that the paradigm shift towards a biopsychosocial approach was so
11 great that the physiotherapists felt exposed and vulnerable.

12

13 Other learning components, including observation and access to resources, were considered
14 valuable, but did not hold the same behavior change effect. This affirms the literature that
15 observation and resources alone are insufficient for the transformation of biopsychosocial
16 knowledge and skills into practice (Holopainen et al, 2020; Nielsen, Keefe, Bennell and Jull,
17 2014; Richmond et al, 2016; van der Wees et al, 2008). Similarly, while observing trainers
18 delivering care was considered useful, physiotherapists did not feel this alone transformed
19 their learning. In line with other research, the physiotherapists valued learning from
20 physiotherapy experts, who understood how psychosocial issues relate from the perspective
21 and constraints of physiotherapy clinical practice (Driver, Lovell and Oprescu, 2020;
22 Monaghan, Adams and Fothergill, 2018).

23

24 Time for clinical integration between the workshops was considered an important facilitator
25 towards competency to allow gradual enculturation of knowledge and beliefs for the

1 physiotherapists. Literature on learning a biopsychosocial approach demonstrates that
2 although shorter training programs may elicit changes in physiotherapists' attitudes
3 (Domenech et al, 2011; Jacobs et al, 2016; O'Sullivan, O'Sullivan, O'Sullivan and Dankaerts,
4 2013), whether they change practice behaviors, and patient outcomes is unclear (Overmeer,
5 Boersma, Denison and Linton, 2011; Overmeer, Boersma, Main and Linton, 2009;
6 Sandborgh, Asenlof, Lindberg and Denison, 2010; Stevenson, Lewis and Hay, 2006). After
7 2-day biopsychosocial training programs, physiotherapists have reported feeling
8 overwhelmed with "too much content to digest" (Lawford et al, 2018), and ongoing difficulty
9 with individualizing care (Kelly et al, 2018). Time for clinical integration with transformative
10 learning experiences is an important consideration for any future training aimed at
11 developing competency and successful clinical application of CFT.

12
13 The clinical environment and personal circumstances can inhibit physiotherapists from
14 embedding learnings from a training program (Synnott et al, 2015; Webster-Wright, 2009). In
15 our study, the physiotherapists perceived time constraints, insufficient support from
16 employers and colleagues, difficulties with pushback or conflicting ideas from other
17 clinicians, and lack of privacy, autonomy, and reimbursement to be barriers. Individually, the
18 physiotherapists in our study had their own personal barriers to overcome to achieve
19 competency, including personal attributes, and previous beliefs. Despite these barriers, our
20 study demonstrates that, with adequate training, physiotherapists from various clinical and
21 personal backgrounds can become competent to deliver CFT.

22
23 The desired outcome of CFT training is to upskill physiotherapists with the critical
24 competencies to successfully work with people with chronic pain in the real world (Gruppen,
25 Mangrulkar and Kolars, 2012). Competency-based education has been acknowledged as

1 more effective for skills acquisition in undergraduate physiotherapy (Hush, Nicholas and
2 Dean, 2018) and medicine (Frank et al, 2010; Ten Cate and Billett, 2014). However,
3 literature on employing competency-based education in post-graduate physiotherapy is
4 limited, where time-based models of training dominate (Devonshire and Nicholas, 2018;
5 Foster and Delitto, 2011; Simpson et al, 2021). Our results show that the physiotherapists and
6 trainers felt training towards competency using a competency checklist to be fundamental to
7 the learning process and assessment.

8 Practical implications

9 It is important that future training supports the paradigm shift and behavior change required
10 for physiotherapists to deliver CFT successfully. Our findings suggest that training programs
11 must be multifaceted including didactic, observational, and experiential learning components
12 with mentoring. Competency assessment to ensure behavior change is imperative. Our
13 study's findings on important training factors may help inform other training programs of
14 complex biopsychosocial approaches.

15 Strengths and Limitations

16 We undertook significant reflexive journaling throughout data collection and analysis to
17 enhance the trustworthiness of our results (Connelly, 2016). This was informed by reflexive
18 thematic analysis (Braun and Clarke, 2019, 2021) and included self-reflection on the
19 researcher's position and beliefs. Consequently, the first author immersed herself in the data
20 by reading each transcript in full, reflecting on deeper meaning within the text, questioning and
21 making memos, before imagining, wondering, and reflecting again (Braun and Clarke, 2019,
22 2021). The cross-sectional design with data collection only at the end of the training was a
23 limitation of the study as the physiotherapists may have had difficulty remembering early
24 components of the learning process. Social desirability bias may have been present as the
25 physiotherapists may not have wanted to report negative findings (Collins, Shattell and

1 Thomas, 2005). To mitigate potential bias, the interviewer was not involved in the training
2 process and made reassurances of confidentiality and impartiality clear to the physiotherapists.
3 The trainers' extensive experience in CFT may limit the transferability of these findings to
4 other training programs without the same level of trainer skill and experience.

5 CONCLUSION

6 The CFT learning journey was perceived as a complex and individual behavioral change
7 process by the physiotherapists and trainers. The physiotherapists felt graduated practice
8 exposure with feedback, self-reflection, and time for clinical implementation between
9 training sessions were key elements of the training. The multifactorial nature of the training,
10 encompassing observation, resources and structure, underpinned by the learning alliance
11 between the physiotherapist and trainer, and the group dynamics were influential on the
12 journey towards competency. Although individual and contextual factors posed barriers to
13 the training, these were overcome by all the physiotherapists. This study provides insight into
14 high-quality training for physiotherapists in CFT and important factors in achieving
15 physiotherapist competency. These insights may help inform future training to improve
16 delivery of biopsychosocial interventions and achievement of better patient outcomes.

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20 Author contributions

21 All authors provided input to the concept/idea/research design. All authors developed the
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23 manuscript. The authors included two specialist musculoskeletal physiotherapists, three
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1 References

- 2 Baker R, Camosso-Stefinovic J, Gillies C, Shaw EJ, Cheater F, Flottorp S, Robertson N 2010 Tailored
3 interventions to overcome identified barriers to change: effects on professional practice and
4 health care outcomes. *Cochrane Database of Systematic Reviews* 17: 1465-1858.
- 5 Bekkering GE, Hendriks HJM, Koes BW, Oostendorp RAB, Ostelo R, Thomassen JMC, van Tulder
6 MW 2003 Dutch Physiotherapy Guidelines for Low Back Pain. *Physical Therapy* 89: 82-96.
- 7 Bérubé M-È, Poitras S, Bastien M, Laliberté L-A, Lacharité A, Gross DP 2017 Strategies to translate
8 knowledge related to common musculoskeletal conditions into physiotherapy practice: a
9 systematic review. *Physiotherapy* 104: 1-8.
- 10 Bhaskar R 2004 The possibility of naturalism: a philosophical critique of the contemporary human
11 sciences (4th ed), p. 177-178. London, UK: Routledge.
- 12 Braun V, Clarke V 2006 Using thematic analysis in psychology. *Qualitative Research in Psychology* 3:
13 77-101.
- 14 Braun V, Clarke V 2019 Reflecting on reflexive thematic analysis. *Qualitative Research in Sport,
15 Exercise and Health* 11: 589-597.
- 16 Braun V, Clarke V 2021 One size fits all? What counts as quality practice in (reflexive) thematic
17 analysis? *Qualitative Research in Psychology* 18: 328-352.
- 18 Caneiro JP, Bunzli S, O'Sullivan P 2021 Beliefs about the body and pain: the critical role in
19 musculoskeletal pain management. *Brazilian Journal of Physical Therapy* 25: 17-29.
- 20 Caneiro JP, Smith A, Rabey M, Moseley GL, O'Sullivan P 2017 Process of change in pain-related fear:
21 clinical insights from a single case report of persistent back pain managed with Cognitive
22 Functional Therapy. *Journal of Orthopaedic & Sports Physical Therapy* 47: 637-651.
- 23 Clarke V, Braun V 2016 Thematic analysis. *Journal of Positive Psychology* 12: 1-2.
- 24 Collins M, Shattell M, Thomas SP 2005 Problematic interviewee behaviors in qualitative research.
25 *Western Journal of Nursing Research* 27: 188-199.
- 26 Connelly LM 2016 Trustworthiness in Qualitative Research. *Medsurg Nursing* 25: 435-436.

- 1 Cowell I, O'Sullivan P, O'Sullivan K, Poyton R, McGregor A, Murtagh G 2018 Perceptions of
2 physiotherapists towards the management of non-specific chronic low back pain from a
3 biopsychosocial perspective: a qualitative study. *Musculoskeletal Science and Practice* 38: 113-
4 119.
- 5 Cowell I, O'Sullivan P, O'Sullivan K, Poyton R, McGregor A, Murtagh G 2019 The perspectives of
6 physiotherapists on managing nonspecific low back pain following a training programme in
7 cognitive functional therapy: a qualitative study. *Musculoskeletal Care* 17: 79-90.
- 8 Dagenais S, Caro J, Haldeman S 2008 A systematic review of low back pain cost of illness studies in
9 the United States and internationally. *Spine* 8: 8-20.
- 10 Daley BJ, Cervero RM 2016 Learning as the basis for continuing professional education. *New Direction*
11 *in Adult Continued Education* 2016: 19-29.
- 12 Denzin NK, Lincoln YS 2017 Introduction. In: Denzin NK, Lincoln YS (Eds) *The SAGE handbook of*
13 *qualitative research (5th ed)*, p.1-26. California, USA: SAGE Publications.
- 14 Devonshire E, Nicholas MK 2018 Continuing education in pain management: using a competency
15 framework to guide professional development. *Pain Reports* 3: e688.
- 16 Domenech J, Sanchez-Zuriaga D, Segura-Orti E, Espejo B, Lison JF 2011 Impact of biomedical and
17 biopsychosocial educative modules on the attitudes, beliefs and recommendations of health
18 care providers about low back pain: a randomised clinical trial. *European Spine Journal* 20:
19 S438.
- 20 Donaghy ME, Morss K 2000 Guided reflection: a framework to facilitate and assess reflective practice
21 within the discipline of physiotherapy. *Physiotherapy Theory and Practice* 16: 3-14.
- 22 Driver C, Lovell GP, Oprescu F 2020 Psychosocial strategies for physiotherapy: a qualitative
23 examination of physiotherapists' reported training preferences. *Nursing and Health Sciences*
24 23: 136-147.
- 25 Driver C, Oprescu F, Lovell GP 2020 An exploration of physiotherapists' perceived benefits and
26 barriers towards using psychosocial strategies in their practice. *Musculoskeletal Care* 18: 111-
27 121.

- 1 Eva KW, Armson H, Holmboe E, Lockyer J, Loney E, Mann K, Sargeant J 2012 Factors influencing
2 responsiveness to feedback: on the interplay between fear, confidence, and reasoning processes.
3 *Advances in Health Sciences Education* 17: 15-26.
- 4 Foster NE, Delitto A 2011 Embedding psychosocial perspectives within clinical management of low
5 back pain: integration of psychosocially informed management principles into physical
6 therapist practice - challenges and opportunities. *Physical Therapy* 91: 790-803.
- 7 Frank JR, Snell LS, Cate OT, Holmboe ES, Carraccio C, Swing SR, Harris P, Glasgow NJ, Campbell
8 C, Dath D 2010 Competency-based medical education: theory to practice. *Medical Teacher* 32:
9 638-645.
- 10 Fritz J, Söderbäck M, Söderlund A, Sandborgh M 2018 The complexity of integrating a behavioral
11 medicine approach into physiotherapy clinical practice. *Physiotherapy Theory and Practice* 35:
12 1182-1193.
- 13 Glattacker M, Heyduck K, Meffert C 2012 Illness beliefs, treatment beliefs and information needs as
14 starting points for patient information - evaluation of an intervention for patients with chronic
15 back pain. *Patient Education and Counseling* 86: 378-389.
- 16 Gorski PS 2013 "What is Critical Realism? And Why Should You Care?". *Contemporary Sociology: a*
17 *Journal of Reviews* 42: 658-670.
- 18 Gray LM, Wong-Wylie G, Rempel GR, Cook K 2020 Expanding qualitative research interviewing
19 strategies: zoom video communications. *The Qualitative Report* 25: 1292-1301.
- 20 Grimshaw JM, Eccles MP, Lavis JN, Hill SJ, Squires JE 2012 Knowledge translation of research
21 findings. *Implementation Science* 7: 1-17.
- 22 Gruppen LD, Mangrulkar RS, Kolars JC 2012 The promise of competency-based education in the health
23 professions for improving global health. *Human Resources for Health* 10: 1-7.
- 24 Guerrero AVS, Maujean A, Campbell L, Sterling M 2018 A systematic review and meta-analysis of
25 the effectiveness of psychological interventions delivered by physiotherapists on pain,
26 disability and psychological outcomes in musculoskeletal pain conditions. *Clinical Journal of*
27 *Pain* 34: 838-857.

- 1 Holopainen R, Piirainen A, Karppinen J, Linton SJ, O'Sullivan P 2020 An adventurous learning journey.
2 Physiotherapists' conceptions of learning and integrating cognitive functional therapy into
3 clinical practice. *Physiotherapy Theory and Practice* 38: 309-326.
- 4 Holopainen R, Simpson P, Piirainen A, Karppinen J, Schütze R, Smith A, O'Sullivan P, Kent P 2020
5 Physiotherapists' perceptions of learning and implementing a biopsychosocial intervention to
6 treat musculoskeletal pain conditions: a systematic review and metasynthesis of qualitative
7 studies. *Pain* 161: 1150-1168.
- 8 Hsu C, Evers S, Balderson BH, Sherman KJ, Foster NE, Estlin K, Levine M, Cherkin D 2019
9 Adaptation and implementation of the STarT Back Risk Stratification Strategy in a US health
10 care organization: a process evaluation. *Pain Medicine* 20: 1105-1119.
- 11 Hush JM, Nicholas M, Dean CM 2018 Embedding the IASP pain curriculum into a 3-year pre-licensure
12 physical therapy program: redesigning pain education for future clinicians. *Pain reports* 3: e645.
- 13 Jacobs CM, Guildford BJ, Travers W, Davies M, McCracken LM 2016 Brief psychologically informed
14 physiotherapy training is associated with changes in physiotherapists' attitudes and beliefs
15 towards working with people with chronic pain. *British Journal of Pain* 10: 38-45.
- 16 Kallio H, Pietilä A-M, Johnson M, Kangasniemi M 2016 Systematic methodological review:
17 developing a framework for a qualitative semi-structured interview guide. *Journal of Advanced*
18 *Nursing* 72: 2954-2965.
- 19 Keefe FJ, Rumble ME, Scipio CD, Giordano LA, Perri LM 2004 Psychological aspects of persistent
20 pain: current state of the science. *Pain* 5: 195-211.
- 21 Kelly JM, Bunzli S, Ritchie C, Kenardy J, Smeets R, Sterling M 2018 Physiotherapist-delivered stress
22 inoculation training for acute whiplash-associated disorders: a qualitative study of perceptions
23 and experiences. *Musculoskeletal Science and Practice* 38: 30-36.
- 24 Kent P, O'Sullivan P, Smith A, Haines T, Campbell A, McGregor AH, Hartvigsen J, O'Sullivan K,
25 Vickery A, Caneiro JP, et al 2019 RESTORE—Cognitive functional therapy with or without
26 movement sensor biofeedback versus usual care for chronic, disabling low back pain: study
27 protocol for a randomised controlled trial. *BMJ Open* 9: e031133.

- 1 Koes BW, van Tulder M, Lin C-WC, Macedo LG, McAuley J, Maher C 2010 An updated overview of
2 clinical guidelines for the management of non-specific low back pain in primary care. *European*
3 *Spine Journal* 19: 2075-2094.
- 4 Lawford BJ, Delany C, Bennell KL, Bills C, Gale J, Hinman RS 2018 Training physical therapists in
5 person-centered practice for people with osteoarthritis: a qualitative case study. *Arthritis Care*
6 *and Research* 70: 558-570.
- 7 Lefroy J, Watling C, Teunissen PW, Brand P 2015 Guidelines: the do's, don'ts and don't knows of
8 feedback for clinical education. *Perspectives on Medical Education* 4: 284-299.
- 9 Monaghan J, Adams N, Fothergill M 2018 An evaluation of a pain education programme for
10 physiotherapists in clinical practice. *Musculoskeletal Care* 16: 103-111.
- 11 Nicholas MK, George SZ 2011 Psychologically informed interventions for low back pain: an update
12 for physical therapists. *Physical Therapy* 91: 765-776.
- 13 Nielsen M, Keefe FJ, Bennell K, Jull GA 2014 Physical therapist-delivered cognitive-behavioral
14 therapy: a qualitative study of physical therapists' perceptions and experiences. *Physical*
15 *Therapy* 94: 197-209.
- 16 Nijs J, Roussel N, Paul van Wilgen C, Köke A, Smeets R 2013 Thinking beyond muscles and joints:
17 Therapists' and patients' attitudes and beliefs regarding chronic musculoskeletal pain are key to
18 applying effective treatment. *Manual Therapy* 18: 96-102.
- 19 O'Sullivan K, O'Sullivan P, O'Sullivan L, Dankaerts W 2013 Back pain beliefs among physiotherapists
20 are more positive after biopsychosocially orientated workshops. *Physiotherapy Practice and*
21 *Research* 34: 37-45.
- 22 O'Sullivan PB, Caneiro JP, O'Keeffe M, Smith A, Dankaerts W, Fersum K, O'Sullivan K 2018
23 Cognitive Functional Therapy: An Integrated Behavioral Approach for the Targeted
24 Management of Disabling Low Back Pain. *Physical Therapy* 98: 408-423.
- 25 Overmeer T, Boersma K, Denison E, Linton SJ 2011 Does teaching physical therapists to deliver a
26 biopsychosocial treatment program result in better patient outcomes? A randomized controlled
27 trial. *Physical Therapy* 91: 804-819.

- 1 Overmeer T, Boersma K, Main CJ, Linton SJ 2009 Do physical therapists change their beliefs, attitudes,
2 knowledge, skills and behaviour after a biopsychosocially orientated university course? *Journal*
3 *of Evaluation in Clinical Practice* 15: 724-732.
- 4 Richmond H, Hall AM, Hansen Z, Williamson E, Davies D, Lamb SE 2016 Using mixed methods
5 evaluation to assess the feasibility of online clinical training in evidence based interventions: a
6 case study of cognitive behavioural treatment for low back pain. *BMC Medical Education* 16:
7 163.
- 8 Rollnick S, Miller WR 1995 What is motivational interviewing? *Behavioural and Cognitive*
9 *Psychotherapy* 23: 325-334.
- 10 Sandborgh M, Asenlof P, Lindberg P, Denison E 2010 Implementing behavioural medicine in
11 physiotherapy treatment. Part II: Adherence to treatment protocol. *Advances in Physiotherapy*
12 12: 13-23.
- 13 Sanders T, Ong BN, Sowden G, Foster N 2014 Implementing change in physiotherapy: professions,
14 contexts and interventions. *Journal of Health Organization and Management* 28: 96-114.
- 15 Simpson P, Holopainen R, Schütze R, O'Sullivan P, Smith A, Linton SJ, Nicholas M, Kent P 2021
16 Training of physical therapists to deliver individualized biopsychosocial interventions to treat
17 musculoskeletal pain conditions: a scoping review. *Physical Therapy* 101: pzab188.
- 18 Stevenson K, Lewis M, Hay E 2006 Does physiotherapy management of low back pain change as a
19 result of an evidence-based educational programme? *Journal of Evaluation in Clinical Practice*
20 12: 365-375.
- 21 Synnott A, O'Keeffe M, Bunzli S, Dankaerts W, O'Sullivan P, O'Sullivan K 2015 Physiotherapists may
22 stigmatise or feel unprepared to treat people with low back pain and psychosocial factors that
23 influence recovery: a systematic review. *Journal of Physiotherapy* 61: 68-76.
- 24 Synnott A, O'Keeffe M, Bunzli S, Dankaerts W, O'Sullivan P, Robinson K, O'Sullivan K 2016
25 Physiotherapists report improved understanding of and attitude toward the cognitive,
26 psychological and social dimensions of chronic low back pain after Cognitive Functional
27 Therapy training: a qualitative study. *Journal of Physiotherapy* 62: 215-221.

- 1 Tebes JK 2005 Community science, philosophy of science, and the practice of research. *American*
2 *Journal of Community Psychology* 35: 213-230.
- 3 Ten Cate O, Billett S 2014 Competency-based medical education: origins, perspectives and
4 potentialities. *Medical Education* 48: 325-332.
- 5 Tong A, Sainsbury P, Craig J 2007 Consolidated criteria for reporting qualitative research (COREQ):
6 a 32-item checklist for interviews and focus groups. *International Journal for Quality in Health*
7 *Care* 19: 349-357.
- 8 van der Wees PJ, Jamtvedt G, Rebbek T, de Bie RA, Dekker J, Hendriks EJ 2008 Multifaceted
9 strategies may increase implementation of physiotherapy clinical guidelines: a systematic
10 review. *Journal of Physiotherapy* 54: 233-241.
- 11 Vibe Fersum K, O'Sullivan P, Skouen JS, Smith A, Kvåle A 2013 Efficacy of classification-based
12 cognitive functional therapy in patients with non-specific chronic low back pain: a randomized
13 controlled trial. *European Journal of Pain* 17: 916-928.
- 14 Vos T, Barber RM, Bell B, Bertozzi-Villa A, Biryukov S, Bolliger I, Charlson F, Davis A, Degenhardt
15 L, Dicker D, et al 2015 Global, regional, and national incidence, prevalence, and years lived
16 with disability for 301 acute and chronic diseases and injuries in 188 countries, 1990–2013: a
17 systematic analysis for the Global Burden of Disease Study 2013. *The Lancet* 386: 743-800.
- 18 Webster-Wright A 2009 Reframing professional development through understanding authentic
19 professional learning. *Review of Educational Research* 79: 702-739.
- 20 Winstone NE, Nash RA, Parker M, Rowntree J 2017 Supporting learners' agentic engagement with
21 feedback: a systematic review and a taxonomy of recipience processes. *Educational*
22 *Psychologist* 52: 17-37.
- 23 Zangoni G, Thomson OP 2017 'I need to do another course' - Italian physiotherapists' knowledge and
24 beliefs when assessing psychosocial factors in patients presenting with chronic low back pain.
25 *Musculoskeletal Science and Practice* 27: 71-77.
- 26 Figure 1. Training of the physiotherapists in Cognitive Functional Therapy
- 27 Figure 2. Learner driver analogy