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‘My hip is damaged’.

A qualitative investigation of people seeking care for persistent hip pain

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ABSTRACT

Objectives: Clinicians who use the biopsychosocial approach to manage musculoskeletal pain disorders aim to understand how patients make sense of their symptoms. Treatment includes targeting the negative beliefs and coping responses that can lead to progressive pain and disability. We aimed to explore how people seeking care for persistent hip pain and disability make sense of their symptoms.

Methods: Cross-sectional qualitative study. People were eligible if they were aged ≥18 years, were consulting an orthopaedic surgeon for persistent hip pain, and offered a non-surgical intervention. Data were collected through interviews that explored patients' beliefs about the identity (diagnosis), causes, consequences, timeline and controllability of their symptoms, their strategies to cope with pain, and their experiences in seeking healthcare. Transcribed interview data were analysed thematically using a framework approach.

Results: Sixteen people (median age = 51, range = 33-73 years; median duration hip pain = 3 years, range = 3 months-20 years) participated. Most participants (10/16) believed their pain was caused by an exercise-related injury. Because of the results of imaging and interactions with healthcare professionals, all participants believed they had damaged hip structures. All described ineffective strategies to manage their pain and multiple failed treatments. For many (7/16), a lack of control over symptoms threatened their physical and mental health.

Conclusions: The way participants with persistent hip pain and disability made sense of their symptoms contributed to them avoiding physical activity and it impaired their sleep, emotional wellbeing and physical health.

Key words: persistent hip pain, Common Sense Model, qualitative

What are the findings?

- Interactions with healthcare professionals can lead to people with persistent hip pain developing 'hip damage' beliefs.
- Discussions of imaging findings may contribute to people developing 'hip damage' beliefs.
- Negative beliefs can lead to ineffective coping strategies such as avoiding physical activity. This in turn impairs physical wellbeing and mental health in people with persistent hip pain.

How might it impact on clinical practice in the future?

- Healthcare professionals influence health beliefs and coping responses of people with persistent hip pain. Our findings highlight that clinicians need to be taught that their choice of words – communication content – influences patient outcomes. Future research should address the question – 'What is the ideal message for patients with hip pain?'.

INTRODUCTION

One in five people aged over 60 years(1) and one in four women aged over 50 years(2) experience pain and tenderness in the greater trochanter, groin or gluteal region. Hip pain is associated with physical and functional impairments, disturbed sleep and psychological distress(3-5) and may result from several conditions in the hip region.

Common diagnoses in patients who present with “hip pain” include trochanteric bursitis, gluteal tendinopathy, femoroacetabular impingement syndrome, acetabular labral tears, and osteoarthritis, some of which are often co-existing.(6) These conditions are also present among the non-symptomatic population(7) and the correlation between radiographic findings and hip pain and disability is weak.(8) Cognitive factors including beliefs about musculoskeletal pain strongly influence pain-related distress and the behavioural responses that drive persistent pain and disability.(5, 9, 10)

The Common Sense Model,(11) states that people who experience musculoskeletal pain draw on a set of beliefs to make sense of their symptoms and decide what to do about them. This set of beliefs, comprised of beliefs about the identity, causes, consequences, controllability of the symptom and how long it will last, are informed by previous personal experiences, observing others and incorporating external sources of information such as that from healthcare professionals (HCPs) and the media. Studies in low back pain (LBP)(12) and osteoarthritis in multiple joints(13) have shown that the way people make sense of their pain is associated with disability up to six years later. Among patients awaiting joint replacement surgery, a negative set of beliefs (e.g. lower control over symptoms) is associated with reduced functional capacity post-surgery,(14) while a positive set of beliefs (e.g. lifestyle less impacted by the illness) is associated with better functional outcomes.(15)

Identifying and addressing negative beliefs in people who present for the treatment of persistent musculoskeletal pain should be a key objective of the clinical encounter,(16, 17) but little is known about what people with hip pain believe about their condition. The limited research investigating cognitive factors in hip pain has been based on self-report questionnaires.(4, 5, 8) We have previously explored how people with LBP and knee pain make sense of their pain through qualitative interviews based on the Common Sense Model.(18) Adopting a similar approach, the aim of this study is to explore how people seeking care for persistent hip pain make sense of their hip symptoms.

PATIENTS AND METHODS

Design

This qualitative interview study was the baseline phase of a prospective case series for hip pain management.

Recruitment

Between October 2016 and June 2017, two orthopedic surgeons from a private clinic in Perth, Western Australia, identified candidates who met the eligibility criteria (see Box 1). Both surgeons receive a high volume of referrals for hip surgery consultations.

Box 1. Eligibility criteria

Inclusion criteria:

1. Aged 18 years and over
2. Experienced hip pain in the groin, lateral hip or gluteal region
3. Were candidates for surgery but had agreed to participate in a physiotherapy-directed cognitive functional intervention(19)

Exclusion criteria:

1. Previous major ipsilateral hip surgery (i.e. total hip arthroplasty and/or osteotomy)
2. Evidence of severe ipsilateral hip osteoarthritis involving noncongruent articular surfaces
3. Women who were pregnant or seeking to become pregnant during the study period
4. Individuals who were physically or mentally compromised (i.e., currently being treated for a psychiatric disorder, senile dementia, Alzheimer's disease, presence of alcohol or substance abuse), rendering them unwilling or unable to comply with scheduled evaluations and/or rehabilitation
5. Comorbidities causing severe mobility impairment (e.g. limb amputation, multiple sclerosis, muscular dystrophy, Parkinson's disease, morbidly obese, hemiplegic, lower limb fracture)

All eligible candidates were invited to participate in the prospective case series. Of the 28 people referred, 11 declined or were unable to be contacted. One further individual was excluded from analysis due to being pregnant. Sixteen people were enrolled in the case series. This paper reports findings from the baseline interview which all 16 participants took part in one week prior to commencing the intervention (see Figure 1).

Data collection

Participants completed an online questionnaire in the week prior to their interview. Demographic data comprised of age, sex and work status. Clinical characteristics included the duration of pain, impact of hip disease (assessed using the International Hip Outcome Tool 12(20) – see online

supplementary box 1), the risk of persistency and disability (assessed using the Örebro Musculoskeletal Pain Questionnaire Short Form(21) – see online supplementary box 2). Where available, reports from diagnostic imaging procedures participants had undergone in the last three years were reviewed and summarized by the research team.

Individual interviews were conducted in a consultation room of the participating clinic (n=15) or over the phone (n=1). Interviews were scheduled before participants began a physiotherapy-directed cognitive functional intervention.(19) Interviews were conducted by a female academic physiotherapist experienced in qualitative interviewing (BO), who was not previously known to the participants or involved in their treatment. Informed by our previous studies in people with LBP and knee pain, the interview schedule was structured on the Common Sense Model.(11)

To explore how people made sense of their symptoms, the interviewer asked participants to explain any diagnostic labels they had been given for their symptoms and what these labels meant to them (Identity beliefs). We asked them what they thought the cause(s) of their symptoms were (Cause beliefs), what consequences they perceived the symptoms had (Consequence beliefs) and how long they expected the symptoms to last (Timeline beliefs). We also asked them how much control they believed they had over the symptom, the actions they took to address their symptoms, how effective they perceived these actions to be and what they believed it would take to get control over their symptoms (Control beliefs). Interviews lasted on average 60 minutes, were audio recorded and transcribed prior to analysis.

Analysis

Transcripts were uploaded into NVivo 10 (QSR International, Melbourne, Australia) to facilitate analysis. Data analysis involved a framework approach.(22) For each transcript, two authors (SB, BO) classified interview responses into *a priori* categories (see 'Category' column Table 2). Data classified under each category was then analysed using inductive coding methods i.e. codes were identified from the raw data rather than defined *a priori.* For example, under the *a priori* category 'Cause', the codes: 'ageing processes' and 'weakness' were identified in the raw data. The two authors then independently performed inductive coding on four transcripts to develop an index of codes. One author (SB) then applied the index to all transcripts. The refined index appears in Table 1 in the 'codes' column. Interview extracts were charted onto a matrix template with categories and codes as row headings, and participant identifiers as column headings. Reoccurring codes within and among codes were identified and emerging interpretations were discussed and challenged among the researchers in this study with different professional backgrounds: clinical

physiotherapists (AS, PO, SH and SB), orthopaedic surgeons (DF and RK), and physiotherapists with expertise in qualitative designs (BO and SB).

RESULTS

Participants were each given a pseudonym and their demographic and clinical characteristics are presented in Table 1. Their median (range) age was 51 years (33 to 73 years) and the median (range) duration of hip pain was three years (four months to 20 years). The median (range) iHOT-12 score was 33 (11 to 57), suggesting that for most participants, the impact of pain was equal or greater than that reported among people undergoing hip arthroplasty.(23) The median Örebro Musculoskeletal Pain Questionnaire Short Form score was 57, with twelve individuals scoring above the cut off (>50) for high risk of future disability.(21) Eleven participants provided diagnostic imaging reports (e.g. magnetic resonance – MR – images). The most common findings on diagnostic imaging were labral tears, chondral damage and gluteal tendinopathies and tears (see Table 1.)

1 Table 1. Demographic characteristics, iHOT-12 scores, Örebro scores and Diagnostic imaging report.

Pseudonym	**Sex**	**Age**	**BMI**	**Pain duration (years)**	**Occupation**	**iHOT-12 (0 to 100)**	**Örebro (0 to 100)**	**Diagnostic imaging reports**
Ana	Female	50	20.5	2	Tertiary student	11	82	Mild gluteal tendinopathy (medius and minimus), thickening troch bursa. Tear of anterosuperior and posterosuperior labrum; intralabral cystic change; mild OA, full thickness cartilage loss superior acetabulum 30mmx11mm associated to marrow changes; high grade partial thickness tear gluteus minimus 18mm.
Brooke	Female	67	20.6	10	Retired	36	57	Gluteus minimus tendon tear.
Chloe	Female	54	31.2	3.5	Paid employment	14	67	Chondral degeneration at the superolateral acetabular margin with subcortical cystic changes; thickening and oedema of the greater trochanteric bursa with some gluteal tendinopathy and fissuring; fatty involutional change of the gluteus minimus muscle belly.
Dawn	Female	46	34.6	3	Tertiary student	12	64	Advanced OA; labral tear.
Erin	Female	33	24.1	3.5	Paid employment	29	39	Small full thickness tear anterosuperior labrum; mild reduction femoral head/neck offset anterosuperiorly, may predispose to FAI. Mild trochanteric bursal odema.
Fleur	Female	53	25.3	3	Paid employment	57	27	Degenerative tearing of anterosuperior labrum with associated ligamentum teres tear; some tendinopathy of the common hamstring origin.
Grant	Male	42	27.6	.3	Paid employment	35	58	Query ossicle at at anterosuperior acetabulum.
Helen	Female	52	26.7	1.5	Tertiary student	45	56	Tearing superior labrum, thinning acetabular rim.
Ian	Male	51	25.2	6	Paid employment	33	55	Complete avulsion of conjoint attachment of semitendinosus and biceps femoris tendons from the ischial tuberosity. Extension tear into semimembranosus attachment partially retracted. Adductor tendonitis.
Jane	Female	51	26.4	15	Paid employment	42	24	Sacro-iliac joint highly suspicious for a subchondral insufficiency fracture. Small osseous bump at the

								anterior femoral head/neck junction consistent with asphericity. Chondrolabral tear spanning 6mm involving the superolateral and posterolateral labrum. Increased signal involving the quadratus femoris muscle. Minor insertional tearing of the hamstring origin. Ischiofemoral impingement suggested.
	Karen	Female	66	33.5	3	Retired	14	57	Tendinopathy of gluteus medius and minimus tendons without high grade focal tearing. Mild thickening of trochanteric bursa but no evidence of effusion. Greater trochanter bursitis.
	Liam	Male	73	33.2	20	Retired	46	65	Greater trochanter bursitis. Partial gluteus medius tear.
	Mia	Female	43	26.8	2	Paid employment	56	43	Tear at anterosuperior quadrant of the acetabular labrum with an extremely small paralabral cyst; mild degenerative change at the hip joint, chondral loss from the femoral head peripheral to the fovea and minor chondral fissuring at the acetabulum laterally; gluteus minimus and medius tendon pathology, more pronounced in relation to the anterior fibres of gluteus medius markedly tendinopathic.
	Nancy	Female	40	24.6	2	Paid employment	19	72	Partial labral tear involving the superior labrum. Mild iliopsoas bursitis. Low grade iliopsoas muscular strain.
	Owen	Male	41	32.9	6.5	Paid employment	22	61	Partially reducible fat containing inguinal hernia. Gluteus medius tendinopathy with mild thickening trochanteric bursa; mild bony protuberance at femoral head/neck junction suggestive of early CAM.
	Paige	Female	57	34.2	16	Paid employment			Tear of anterosuperior and posterosuperior portions of the labrum with intralabral cystic change. Mild osteoarthritis of hip joint and synovitis. High grade partial thickness tear of the gluteus minimus tendon.

*iHOT and Örebro: 0 to 100, higher is better; Abbreviations: OA = osteoarthritis; FAI = femoroacetabular impingement; CAM = type of femoroacetabular impingement; Note: information under 'Diagnostic imaging reports' column are verbatim "quotes" sourced from ultrasound, magnetic resonance and computed tomography imaging reports.

Participants reported they had engaged in the health system and had consulted with multiple HCPs including general practitioners, orthopaedic surgeons, radiologists, physiotherapists, exercise physiologists, chiropractors, nurses, natural medicine and regenerative medicine consultants. The outcome of the analytic process is presented in Table 2. Four key themes were identified: 1. 'Lay' versus 'informed' perceptions of cause; 2. 'Fissures and tears': the use of the diagnostic jargon 3. 'Fixing damage' and 'controlling symptoms'; and 4. Exercise, sleep and the threat to mental health. Each theme is described below, with supporting quotes presented in Table 3. Themes are further illustrated within the Common Sense Model(11) in Figure 2.

Table 2. Outcome of analytic process

Categories	Codes	Themes
Interpretation	Personal description of symptoms	'Lay' versus 'informed' perceptions of cause
	Previous experiences of hip pain	
	Meaning of symptoms	
	Medical history	
Cause	Activities/movements associated with onset	
	Associated condition, anatomy or injury	
	Traumatic injury	
	Ageing processes	
	Weakness	
Identity	Labels or diagnosis	'Fissures and tears': the use of the diagnostic jargon
	Diagnostic imaging	
	Diagnostic uncertainty	
Controllability	Activities/movements associated with flare ups	Controlling symptoms and 'fixing damage'
	Predictability of pain	
	Treatment expectations	
	Coping strategies	
	Self efficacy	
Action and appraisal	Behavioural modification	
	Care seeking experience	
	Filed treatments	
	Successful treatments	
Timeline	Recovery expectations	Exercise, sleep and threat to mental health
	Future hip replacement	
Consequences	Physical impact	
	Functional impact	
	Emotional impact	
	Social impact	
	General impact	
	Sleep	

Contextual life stressors	Mental health Stressful life events

1. 'Lay' versus 'informed' perceptions of cause (Table 3, quotes 1-9)

A range of perceived causes were reported. Common to the narratives of eight participants was a history of high intensity physical activity, either in their younger years (Q1) or leading up to onset of hip pain. Ten participants believed their hip pain was caused by excessive exercising or altered movements (Q2). Another eight participants believed their hip pain may have been attributed to their previous history of persistent low back pain (Q3). The experiences of younger participants could be differentiated from older participants who perceived that hip pain was a normal part of ageing (Q4). Often multiple causal attributions could be identified in participants' narratives. For example, one participant attributed her hip pain to lifting young children; muscle loss following cancer treatment; and a leg length discrepancy 'diagnosed' by a chiropractor (Q5)

All participants had widely sought care for their hip pain from various HCPs. Participants appeared to differentiate between what they thought was the cause of their pain ('lay' perceptions) and what HCPs had told them was the cause of their pain ('informed' perceptions). Sometimes 'lay' and 'informed' perceptions of cause conflicted (Q6). 'Lay' perceptions of cause were favoured over 'informed' perceptions of cause when they made more sense in the timeline of pain (Q7) or when informed causal attributions provided little hope of 'fixing' the problem. This was particularly the case for three women who reported their HCP telling them that tendons can 'spontaneously' break down in women over 50 (Q8). Conversely for some, 'informed' perceptions of cause were favoured over 'lay' perceptions when they provided more hope of getting control over pain. This was illustrated by one participant who had thought that her hip was caused by the sexual abuse she had suffered in the past until a HCP suggested that it was caused by a previous back injury (Q9).

2. 'Fissures and tears': the use of the diagnostic jargon (see Table 3, quotes 10-13)

All participants had undergone multiple diagnostic imaging, usually a radiograph, CT scan and MR imaging. When describing the imaging findings, the participants used precise diagnostic medical terms. They used anatomical terms such as 'acetabulum', 'gluteal muscles' and 'labrum'. They used terms such as 'fissuring' and 'tearing' to describe how the tissue in their hip structures were 'damaged' (Q10). Many participants perceived that the imaging findings could explain the symptoms they were experiencing. For example, one participant described how she had always felt like something was catching in hip, and the torn labrum seen on the MR images provided her with

a way to make sense of this symptom (Q11). While some participants were reassured to receive a diagnosis that could explain their symptoms, others found it frightening to receive imaging reports detailing so many things wrong with their hip (Q12). Only a couple of participants believed that the imaging findings did not satisfactorily explain their symptoms and felt that they needed more invasive investigation (Q13).

3. Fixing damage and controlling symptoms (see Table 3, quotes 14-24)

Participants differentiated between strategies to 'fix the damage' and 'control the symptoms' (Q14). Most were optimistic that their 'damaged' hip structures could be 'fixed', and despite almost all having done physiotherapy directed exercises in the past, most believed they would benefit from further 'strengthening' their hip and core muscles. In particular, participants who perceived their hip to be 'unstable' believed strengthening exercises were the key to fixing their problem (Q15). Four participants suggested that stem cell technology had the potential to regenerate their damaged tissue and resolve their condition; two had already undergone stem cell injections. One participant was optimistic that the recent stem cell injection would 'knit' the labral tear together (Q8), while another described feeling disappointed when the second plasma injection did not provide him with the pain relief he experienced with the first (Q16). Five participants believed that a future hip replacement was inevitable because there was nothing else that they could do to address the underlying structural abnormality (Q17) or because they felt they had exhausted all non-surgical treatment options (Q18).

Older participants felt that they needed to accept that they were not as young as they used to be (Q19). Most participants controlled their symptoms through avoiding the activities and movements that they believed would aggravate their symptoms (Q20). When avoidance was not possible, they described attempts to modify their behavior during these activities and movements (Q21). Two participants had gone to extreme lengths, learning alternative therapies such as self-administered needling in order to control their symptoms (Q22). Almost all participants had undergone cortisone injections, but these had failed to provide sustained relief (Q23). The repeat experience of failed treatments took a psychological toll on the participants, with many describing feelings of distress associated with 'not knowing what else to do' to get control over their symptoms (Q24).

4. Exercise, sleep and the threat to mental health (see Table 3, quotes 25-28)

For many participants, exercise had played a central role in their lives and was seen as fundamental to their psychological wellbeing. Seven described how their inability to exercise threatened their mental health (Q25). The perceived consequences of being unable to exercise included irritability

and frustration as well as worry about one's general health. One participant who had survived cancer, described her fear that the cancer could return if she didn't maintain a high level of exercise (Q26). Three participants were particularly concerned that their inability to exercise would exacerbate their underlying mood disorders (Q27). Eight participants experienced pain at night which awoke them from sleep. A lack of sleep impaired emotional wellbeing by sparking a cascade of consequences including inability to concentrate and participate in paid work, and disrupted relationships (Q28).

Table 3. Supporting quotes

Theme 1. 'Lay' versus 'informed' perceptions of cause	
Q1	"*I have a history of being quite athletic, a dancer, for a lot of my developmental years. I do have hypermobility*" (Fleur)
Q2	*"I thought maybe it's because I was cycling more. I was trying to cycle every day 20, 25 kms …And I was trying to do more*" (Paige)
Q3	*"My back was just terrible, and it just escalated over the years… It was just getting progressively worse down the nerve down the leg."* (Owen).
Q4	*"It's because I am getting old"* (Karen)
Q5	*"I had grandkids a few years ago and whether that might have exacerbated it. I've also had cancer and lost a lot of muscle tone. It's also been suggested I've got one leg longer than the other, some say yes, some say no. I don't know" (Brooke)*
Q6	"*All the scans of everything seem to think that the sporting injury actually really isn't that related to what I've got…The doctors have said I was due to get it because of the structure of where my body is sitting as far as my spine and hip"* (Nancy)
Q7	*"I know everything the doctors have said to me but it just seems too much of a coincidence that it all happened after (the slip*)" (Nancy)
Q8	*"Unfortunately, they see a lot of women over 50 who suddenly developed this. He said it is the tendon breaking down, degenerating. They said they didn't think that anything causes it, it just spontaneously happens in women over 50. I'm just getting old and breaking down and there is nothing I can do about it"* (Ana)
Q9	"*Well maybe it happened during sexual abuse, maybe damage happened ... How can the hip end up with five different things wrong with it, and all pretty significant things*? (…) *But the doctor examined me and said the hip's painful, he didn't dispute that, but he thought the problem was the lower back. As soon as he said that, I remembered that I had taken a fall at yoga and I'd fallen on a wall hook that stuck out from the wall about. I started putting the pieces together and thought oh, well I can work with that information. That's where I feel like I've got a bit of power back and I could start actually doing something with the hip"* (Chloe)

Theme 2. 'Fissures and tears': the use of the diagnostic jargon	
Q10	"*There's fissuring in every single muscle: the obturator internus and externus, the glute max, the glute min are both very distressed. Then the head of the femur is leaking bone marrow into the hip joint, which is causing a lot of inflammation in the hip, and the acetabulum has fissures in it as well. I assume that's what's flipping and causing me the instant pain*" (Chloe)
Q11	"*All I could say was that it felt like it was catching. Until I had the MRI and was able to identify that there was some shredding, and some tears, and a stretching, the labral stretching*" (Fleur)
Q12	*"To read, essentially, four things that were in that one area, well two locations, but one area of my body let's say, sort of one hand-span, I guess. All that stuff was going on in that area. It was really, really frightening and scary*" (Jane).
Q13	"*There's a part of me that just wants to go in and say, "Look, you know what? Why don't you just go and open me up and have a look?*" (Ian)
Theme 3. Fixing damage and controlling symptoms	
Q14	"*I have to find a way to either deal with it or fix it*" (Dawn)
Q15	"*If I can strengthen around it and if I can improve my core stability and the way that my hip works, then maybe I can decrease some of the laxities that I have*" (Mia)
Q16	*"The plasma injection - the first time it worked brilliantly…for three months, maybe even six months! Then it came back again. My general practitioner said I could expect that to happen, and he wanted a couple, maybe two or three goes. And so when I had to go back for the second one, it did nothing at all. He said "Don't waste your money. We're not doing it anymore*" (Liam)
Q17	"*He said almost every patient that he has seen that has exact same sort of tilted pelvis between the ages of 40 and 50 have to have hip replacement. So, I've made it, turned 46!"* (Dawn)
Q18	"*Over these two years, I've tried everything. I've tried to be so proactive and I think at the point, I'd reconciled the idea of a hip replacement because nothing I've tried has worked for me*." (Nancy)
Q19	*"I guess that I just have to accept it. I don't like it. But you just have to get old gracefully!*" (Karen)
Q20	*"Try to avoid, avoidance is the keyword... Avoid doing what makes it hurt*" (Karen)
Q21	"*It doesn't necessarily stop me from doing the activity, it's more in terms of the general avoidance. If I can't avoid it, I'll still do it, but try to do it differently"* (Grant).
Q22	"*I buy my own 75 mil acupuncture needles, and then just pop them in every so often…it is helping with pain management*" (Ian)

Q23	"*After the first lot of injections, I thought it was good as gone. But then it came back, and I thought, I'm stuck with this"* (Karen)
Q24	"*I don't have a mental issue with it but every now and then, you think you've fixed it, found the problem and you find two or three weeks later it hasn't recovered. So I don't know what to do"* (Brooke)
Theme 4. Exercise, sleep and the threat to mental health	
Q25	"*Anything that I do physically helps me mentally... If I don't get to exercise for three or four days... I need to do something"* (Ian)
Q26	"*I guess that worries me a bit underneath it all because one of the big things with cancer you have to do a lot of exercise*" (Brooke)
Q27	"*I've got a mood disorder, so activity is quite a big factor in terms of the therapy regime. So it's quite frustrating that I can't do any cardiovascular exercise. I think my biggest fear is that they tell me "you'll never be able jog again or never be able to do really cardio again," because that's the only real way to actually manage my mood disorder*" (Grant)
Q28	*"(If I could have) less pain, I'll then get more sleep, which means I'll then be more alert, and I can be physically more active, and then that will have a reinforcing effect on being able to sleep better, and I will have a fuller, more productive life. I'll be happier. So it's a chain reaction*" (Helen)

DISCUSSION

This qualitative study explored how patients seeking care for persistent hip pain made sense of their symptoms.

Making sense of persistent hip pain through a biomedical lens

All participants made sense of their pain through a biomedical lens. They believed that hip pain and disability were due to 'damaged' hip structures; 'degeneration', 'fissures', 'tears', 'detachment' and/or 'arthritis'. Participants reported that these beliefs derived from a combination of diagnostic imaging reports and information provided by HCPs.

Some participants believed their 'damaged' hip structures were caused by physical activity, loading and/or an injury, many reported being told by HCPs that their 'damage' had been caused by 'faulty biomechanics' and aging. These findings are similar to reports among people with knee osteoarthritis(18, 24) and LBP.(25-27) The belief that structural pathology based on radiological imaging is an accurate measure of a person's pain experience is common at a societal level and amongst HCPs.(28, 29) This is despite evidence that levels of pain and disability do not correlate closely with radiographic findings in people with hip pain,(8) that 'pathology' is prevalent in

asymptomatic populations,(30) and that informing patients of imaging findings can lead to poorer health outcomes.(31)

This biomedical lens appeared to influence the participants' coping responses. The participants attempted to limit further damage and control their pain through activity avoidance and movement modification, such as avoiding squatting movements, adopting an antalgic gait, or using upper limb strength to push themselves up from a sitting position or lift themselves out of a car. Activity avoidance and modification due to fear of doing more damage has also been reported among people with persistent LBP (e.g. avoiding "bending" their back or pacing activities) and knee osteoarthritis (e.g. avoiding/pacing activities or choosing activities believed to cause less damage, such as cycling).(18, 24, 32) Research has demonstrated a relationship between negative pain beliefs, greater functional disability and motor control impairments in people with LBP (33) and knee arthritis,(34, 35) further highlighting the interplay between cognitive factors and coping responses to pain.

Although some participants in this study believed they could 'fix' or 'control' the 'damage' to their hips through strengthening exercises, stem cell treatment and steroid injections, previous attempts to do so had failed to provide long-term benefit. These 'failed treatments' reinforced the belief among some participants that the damage to their hip structures was irreversible and that a hip replacement was inevitable. The belief that a joint replacement is the only definitive 'cure' for painful joints is common among older people with lower limb osteoarthritis and HCPs, and may underlie low referral rates and low adherence to effective non-surgical management options.(36-38) The repeated experience of 'failed' treatments has been suggested to play a role in symptom incoherence (an inability to make sense of pain) and the development of pain-related fear in people with musculoskeletal pain.(33)

Peoples' experiences of persistent hip pain were described through a biopsychosocial lens

The biomedical lens through which the participants in this study made sense of their pain, contrasts with the biopsychosocial lens through which they experienced pain. The participants in this study perceived that disrupted sleep and an inability to engage in physical activity threatened their physical and mental well-being, by increasing emotional distress, frustration and compromising their ability to cope. The bidirectional relationship between depression, sleep and persistent musculoskeletal pain is well documented.(39, 40) Furthermore, the interaction of disrupted sleep, depression and reduced activity contributes to vicious cycle of pain, distress and disability.(4, 40) By

illustrating the role of biopsychosocial factors influencing a person's hip pain and disability, these findings strengthen calls to action to change the prevailing biomedical paradigm and reduce reliance on imaging as a sole explanation of a person's pain experience.(19, 36, 41)

CLINICAL IMPLICATIONS

To facilitate this change in paradigm, the use of the CLEAR principle when reporting on imaging has been advocated: 1.*Consistent language*: the use of minimally threatening language so as not to create fear, 2.*Epidemiological information* using age-matched findings for asymptomatic populations and 3. *Assessment of relevance*: explaining that imaging findings must be considered with clinical features.(42) In addition, recent guidelines recommend the screening and assessment of biopsychosocial factors including pain beliefs and concerns, fear, depression, social context, sleep, obesity as well as physical activity levels and strength in people with musculoskeletal pain.(36, 43) Where persistent musculoskeletal pain presents with health comorbidities such as obesity, sleep and or mental health disorders, multidisciplinary care is recommended.(19, 36) However, all patients presenting with musculoskeletal pain can benefit from education regarding the multidimensional complexity of musculoskeletal pain. Highlighting the important role that modifiable risk factors such as beliefs, physical activity, sleep and weight management play in their pain disorder, provides opportunities for self-management.(44) Recent research supports the long-term benefits of interventions that target these factors in people with hip and knee pain.(45-47) Table 4 provides examples of alternative health messages that aim to facilitate positive health behaviours.

Table 4. Suggested alternative health messages when communicating with people with persistent hip pain.

Health messages reported by participants in the study linked with unhelpful health behaviours	Alternative evidence-based health messages that aim to promote positive health behaviours for people with hip pain
Your hip pain is due to damaged structures in your hip joint (e.g. labral tears, arthritis)	'Pathoanatomical' changes such as labral tears and hip joint arthritis are common in pain-free populations.(30) This means that other factors are also important to explain hip pain. Pain in the hip structures is influenced by multiple factors such as sleep, fatigue, mood, strength, physical activity and body weight.(40) Many of these factors are influenced by things you can do for yourself. We can make a plan to address these.
Hip tendons spontaneously break down in people over 50… loading them will damage them further	'Pathoanatomical' changes relating to the hip tendons are common in pain-free populations. Tendon health is influenced by lots of factors such as muscle strength, engagement in physical activity, psychological health and levels of obesity.(48, 49) Addressing these factors can keep tendons healthy with aging. It is important to know that it is safe and helpful to engage in graduated exercise with tendon tears – rest and activity avoidance is unhelpful.(43)
Your hip is unstable and needs controlling and stabilising	Hip joints are very stable structures.(50) Maintaining muscle strength and mobility around the hip is important for joint health, while guarding and holding muscles tense can be unhelpful.
Being too lordotic can lead to wear/arthritis on your hips	There is no evidence that spine and pelvis posture predicts hip arthritis. People have a range of postures and body shapes and the body can learn to adapt to movement and load.
Engaging in weight bearing and loaded exercise will damage the hip structures more	Engaging in graduated weight bearing exercise is safe and does not damage the hip structures in people with osteoarthritis.

	In fact exercise is important to maintain the health of your joint.(51)
With your damaged / arthritic hip structures a joint replacement is inevitable	Developing an understanding of your hip pain, building confidence to move, getting strong and active, as well as maintaining a healthy body weight, can reduce pain, disability, need for medication and in many cases the need for surgery.(43)
I think we better get you on some antidepressants to manage your mental health, as exercising vigorously like you used to in order to manage your mental health isn't safe for you now	Physical activity is important for mental health.(52) Exercise is safe as long as it is graduated, and has huge health benefits.(51)
You need a cortisone injection for your hip pain	While cortisone injections can provide short term pain relief for some people, the effects don't last,(53, 54) and may increase osteoarthritis progression especially when repeated.(55) Understanding the factors linked to your pain, building confidence to strengthen your hip, becoming active and managing your weight is a more effective way to manage your pain in the long run.(43)

DESIGN CONSIDERATIONS

We authors are interested in cognitive behavioural interventions for musculoskeletal pain. We selected the Common Sense Model(11) as a validated framework to explore how people make sense of their musculoskeletal symptoms. As is inherent to qualitative research, our lens (*world view*) necessarily influenced the design and conduct of this study. Thus, alternative interpretations to those presented in this paper are possible. By declaring our lens, providing the interview schedule, code book and supporting quotes, we have attempted to leave an 'audit trail' that makes our assumptions and interpretations explicit.

While this study comprised a small convenience sample, we employed qualitative techniques to exhaust new concepts such as concurrent data collection and data analysis to enable us to explore and challenge emerging concepts in subsequent interviews. The patterns we identified among the 16 participants were sufficient to answer our research question. We acknowledge that the insights gained from this small convenience sample are of limited generalisability. To assist readers make judgements about the transferability of these findings to their own clinical settings,(56) we have provided a rich description of the demographic and clinical characteristics of this sample. Prior to enrolling in the study, the participants had all sought an opinion from an orthopaedic surgeon in a private practice setting and had agreed to participate in a physiotherapy-directed cognitive functional intervention. We did not collect demographic data on the 11 people who were referred to the intervention but declined to participate.

Did health literacy influence our study results? People who seek care from doctors in private orthopaedic practice in Australia have higher health literacy than those seeking care from the public system.(57) Whether higher health literacy influenced the beliefs of the participants in this study is uncertain. There is some evidence that people with higher health literacy hold more positive beliefs about musculoskeletal pain.(58) On the other hand, there is evidence that negative beliefs about musculoskeletal pain are, in part, iatrogenic and can arise from conflicting advice from healthcare professionals.(27, 33) Given that people with higher health literacy find it easier seek care,(59) it may be that this sample (which had widely sought care) held more negative beliefs than the wider population. While we emphasise that similar biomedical beliefs have been documented in other musculoskeletal pain populations in different healthcare settings,(18, 24, 60) future research involving larger, more generalizable samples is needed to understand how widespread the beliefs described among this sample are.(61)

CONCLUSION

Participants in this study seeking care for persistent hip pain reported negative beliefs relating to 'damaged' hip structures, which appeared to lead them to coping responses such as activity avoidance and movement modification. Participants reported subsequent psychological distress, disrupted sleep and reduced physical activity, threatening their physical and mental well-being. Targeting pain beliefs and coping strategies may provide opportunities for more effective self-management of persistent hip pain.

Contributors: BO, SB, AS and PO designed the study and were involved in drafting and reviewing of the manuscript. PO, SH, DF and RK facilitated participant recruitment. BO, SB and AS analysed and interpreted the data. All authors provided critical revision of the manuscript. All authors take responsibility for the integrity and accuracy of the data in this study. All authors read and approved the final manuscript.

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Figure legends:

Figure 1. Participant recruitment

Figure 2: Making sense of hip pain within the Common Sense Model

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‘My hip is damaged’.

A qualitative investigation of people seeking care for persistent hip pain

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ABSTRACT

Objectives: Clinicians who use the biopsychosocial approach to manage musculoskeletal pain disorders aim to understand how patients make sense of their symptoms. Treatment includes targeting the negative beliefs and coping responses that can lead to progressive pain and disability. We aimed to explore how people seeking care for persistent hip pain and disability make sense of their symptoms.

Methods: Cross-sectional qualitative study. People were eligible if they were aged ≥18 years, were consulting an orthopaedic surgeon for persistent hip pain, and offered a non-surgical intervention. Data were collected through interviews that explored patients' beliefs about the identity (diagnosis), causes, consequences, timeline and controllability of their symptoms, their strategies to cope with pain, and their experiences in seeking healthcare. Transcribed interview data were analysed thematically using a framework approach.

Results: Sixteen people (median age = 51, range = 33-73 years; median duration hip pain = 3 years, range = 3 months-20 years) participated. Most participants (10/16) believed their pain was caused by an exercise-related injury. Because of the results of imaging and interactions with healthcare professionals, all participants believed they had damaged hip structures. All described ineffective strategies to manage their pain and multiple failed treatments. For many (7/16), a lack of control over symptoms threatened their physical and mental health.

Conclusions: The way participants with persistent hip pain and disability made sense of their symptoms contributed to them avoiding physical activity and it impaired their sleep, emotional wellbeing and physical health.

Key words: persistent hip pain, Common Sense Model, qualitative

What are the findings?

- Interactions with healthcare professionals can lead to people with persistent hip pain developing 'hip damage' beliefs.
- Discussions of imaging findings may contribute to people developing 'hip damage' beliefs.
- Negative beliefs can lead to ineffective coping strategies such as avoiding physical activity. This in turn impairs physical wellbeing and mental health in people with persistent hip pain.

How might it impact on clinical practice in the future?

- Healthcare professionals influence health beliefs and coping responses of people with persistent hip pain. Our findings highlight that clinicians need to be taught that their choice of words – communication content – influences patient outcomes. Future research should address the question – 'What is the ideal message for patients with hip pain?'.

INTRODUCTION

One in five people aged over 60 years(1) and one in four women aged over 50 years(2) experience pain and tenderness in the greater trochanter, groin or gluteal region. Hip pain is associated with physical and functional impairments, disturbed sleep and psychological distress(3-5) and may result from several conditions in the hip region.

Common diagnoses in patients who present with "hip pain" include trochanteric bursitis, gluteal tendinopathy, femoroacetabular impingement syndrome, acetabular labral tears, and osteoarthritis, some of which are often co-existing.(6) These conditions are also present among the non-symptomatic population(7) and the correlation between radiographic findings and hip pain and disability is weak.(8) Cognitive factors including beliefs about musculoskeletal pain strongly influence pain-related distress and the behavioural responses that drive persistent pain and disability.(5, 9, 10)

The Common Sense Model,(11) states that people who experience musculoskeletal pain draw on a set of beliefs to make sense of their symptoms and decide what to do about them. This set of beliefs, comprised of beliefs about the identity, causes, consequences, controllability of the symptom and how long it will last, are informed by previous personal experiences, observing others and incorporating external sources of information such as that from healthcare professionals (HCPs) and the media. Studies in low back pain (LBP)(12) and osteoarthritis in multiple joints(13) have shown that the way people make sense of their pain is associated with disability up to six years later. Among patients awaiting joint replacement surgery, a negative set of beliefs (e.g. lower control over symptoms) is associated with reduced functional capacity post-surgery,(14) while a positive set of beliefs (e.g. lifestyle less impacted by the illness) is associated with better functional outcomes.(15)

Identifying and addressing negative beliefs in people who present for the treatment of persistent musculoskeletal pain should be a key objective of the clinical encounter,(16, 17) but little is known about what people with hip pain believe about their condition. The limited research investigating cognitive factors in hip pain has been based on self-report questionnaires.(4, 5, 8) We have previously explored how people with LBP and knee pain make sense of their pain through qualitative interviews based on the Common Sense Model.(18) Adopting a similar approach, the aim of this study is to explore how people seeking care for persistent hip pain make sense of their hip symptoms.

PATIENTS AND METHODS

Design

This qualitative interview study was the baseline phase of a prospective case series for hip pain management.

Recruitment

Between October 2016 and June 2017, two orthopedic surgeons from a private clinic in Perth, Western Australia, identified candidates who met the eligibility criteria (see Box 1). Both surgeons receive a high volume of referrals for hip surgery consultations.

Box 1. Eligibility criteria

Inclusion criteria:

1. Aged 18 years and over
2. Experienced hip pain in the groin, lateral hip or gluteal region
3. Were candidates for surgery but had agreed to participate in a physiotherapy-directed cognitive functional intervention(19)

Exclusion criteria:

1. Previous major ipsilateral hip surgery (i.e. total hip arthroplasty and/or osteotomy)
2. Evidence of severe ipsilateral hip osteoarthritis involving noncongruent articular surfaces
3. Women who were pregnant or seeking to become pregnant during the study period
4. Individuals who were physically or mentally compromised (i.e., currently being treated for a psychiatric disorder, senile dementia, Alzheimer's disease, presence of alcohol or substance abuse), rendering them unwilling or unable to comply with scheduled evaluations and/or rehabilitation
5. Comorbidities causing severe mobility impairment (e.g. limb amputation, multiple sclerosis, muscular dystrophy, Parkinson's disease, morbidly obese, hemiplegic, lower limb fracture)

All eligible candidates were invited to participate in the prospective case series. Of the 28 people referred, 11 declined or were unable to be contacted. One further individual was excluded from analysis due to being pregnant. Sixteen people were enrolled in the case series. This paper reports findings from the baseline interview which all 16 participants took part in one week prior to commencing the intervention (see Figure 1).

Data collection

Participants completed an online questionnaire in the week prior to their interview. Demographic data comprised of age, sex and work status. Clinical characteristics included the duration of pain, impact of hip disease (assessed using the International Hip Outcome Tool 12(20) – see online

supplementary box 1), the risk of persistency and disability (assessed using the Örebro Musculoskeletal Pain Questionnaire Short Form(21) – see online supplementary box 2). Where available, reports from diagnostic imaging procedures participants had undergone in the last three years were reviewed and summarized by the research team.

Individual interviews were conducted in a consultation room of the participating clinic (n=15) or over the phone (n=1). Interviews were scheduled before participants began a physiotherapy-directed cognitive functional intervention.(19) Interviews were conducted by a female academic physiotherapist experienced in qualitative interviewing (BO), who was not previously known to the participants or involved in their treatment. Informed by our previous studies in people with LBP and knee pain, the interview schedule was structured on the Common Sense Model.(11)

To explore how people made sense of their symptoms, the interviewer asked participants to explain any diagnostic labels they had been given for their symptoms and what these labels meant to them (Identity beliefs). We asked them what they thought the cause(s) of their symptoms were (Cause beliefs), what consequences they perceived the symptoms had (Consequence beliefs) and how long they expected the symptoms to last (Timeline beliefs). We also asked them how much control they believed they had over the symptom, the actions they took to address their symptoms, how effective they perceived these actions to be and what they believed it would take to get control over their symptoms (Control beliefs). Interviews lasted on average 60 minutes, were audio recorded and transcribed prior to analysis.

Analysis

Transcripts were uploaded into NVivo 10 (QSR International, Melbourne, Australia) to facilitate analysis. Data analysis involved a framework approach.(22) For each transcript, two authors (SB, BO) classified interview responses into *a priori* categories (see 'Category' column Table 2). Data classified under each category was then analysed using inductive coding methods i.e. codes were identified from the raw data rather than defined *a priori.* For example, under the *a priori* category 'Cause', the codes: 'ageing processes' and 'weakness' were identified in the raw data. The two authors then independently performed inductive coding on four transcripts to develop an index of codes. One author (SB) then applied the index to all transcripts. The refined index appears in Table 1 in the 'codes' column. Interview extracts were charted onto a matrix template with categories and codes as row headings, and participant identifiers as column headings. Reoccurring codes within and among codes were identified and emerging interpretations were discussed and challenged among the researchers in this study with different professional backgrounds: clinical

physiotherapists (AS, PO, SH and SB), orthopaedic surgeons (DF and RK), and physiotherapists with expertise in qualitative designs (BO and SB).

RESULTS

Participants were each given a pseudonym and their demographic and clinical characteristics are presented in Table 1. Their median (range) age was 51 years (33 to 73 years) and the median (range) duration of hip pain was three years (four months to 20 years). The median (range) iHOT-12 score was 33 (11 to 57), suggesting that for most participants, the impact of pain was equal or greater than that reported among people undergoing hip arthroplasty.(23) The median Örebro Musculoskeletal Pain Questionnaire Short Form score was 57, with twelve individuals scoring above the cut off (>50) for high risk of future disability.(21) Eleven participants provided diagnostic imaging reports (e.g. magnetic resonance – MR – images). The most common findings on diagnostic imaging were labral tears, chondral damage and gluteal tendinopathies and tears (see Table 1.)

1 Table 1. Demographic characteristics, iHOT-12 scores, Örebro scores and Diagnostic imaging report.

Pseudonym	**Sex**	**Age**	**BMI**	**Pain duration (years)**	**Occupation**	**iHOT-12 (0 to 100)**	**Örebro (0 to 100)**	**Diagnostic imaging reports**
Ana	Female	50	20.5	2	Tertiary student	11	82	Mild gluteal tendinopathy (medius and minimus), thickening troch bursa. Tear of anterosuperior and posterosuperior labrum; intralabral cystic change; mild OA, full thickness cartilage loss superior acetabulum 30mmx11mm associated to marrow changes; high grade partial thickness tear gluteus minimus 18mm.
Brooke	Female	67	20.6	10	Retired	36	57	Gluteus minimus tendon tear.
Chloe	Female	54	31.2	3.5	Paid employment	14	67	Chondral degeneration at the superolateral acetabular margin with subcortical cystic changes; thickening and oedema of the greater trochanteric bursa with some gluteal tendinopathy and fissuring; fatty involutional change of the gluteus minimus muscle belly.
Dawn	Female	46	34.6	3	Tertiary student	12	64	Advanced OA; labral tear.
Erin	Female	33	24.1	3.5	Paid employment	29	39	Small full thickness tear anterosuperior labrum; mild reduction femoral head/neck offset anterosuperiorly, may predispose to FAI. Mild trochanteric bursal odema.
Fleur	Female	53	25.3	3	Paid employment	57	27	Degenerative tearing of anterosuperior labrum with associated ligamentum teres tear; some tendinopathy of the common hamstring origin.
Grant	Male	42	27.6	.3	Paid employment	35	58	Query ossicle at at anterosuperior acetabulum.
Helen	Female	52	26.7	1.5	Tertiary student	45	56	Tearing superior labrum, thinning acetabular rim.
Ian	Male	51	25.2	6	Paid employment	33	55	Complete avulsion of conjoint attachment of semitendinosus and biceps femoris tendons from the ischial tuberosity. Extension tear into semimembranosus attachment partially retracted. Adductor tendonitis.
Jane	Female	51	26.4	15	Paid employment	42	24	Sacro-iliac joint highly suspicious for a subchondral insufficiency fracture. Small osseous bump at the

								anterior femoral head/neck junction consistent with asphericity. Chondrolabral tear spanning 6mm involving the superolateral and posterolateral labrum. Increased signal involving the quadratus femoris muscle. Minor insertional tearing of the hamstring origin. Ischiofemoral impingement suggested.
	Karen	Female	66	33.5	3	Retired	14	57	Tendinopathy of gluteus medius and minimus tendons without high grade focal tearing. Mild thickening of trochanteric bursa but no evidence of effusion. Greater trochanter bursitis.
	Liam	Male	73	33.2	20	Retired	46	65	Greater trochanter bursitis. Partial gluteus medius tear.
	Mia	Female	43	26.8	2	Paid employment	56	43	Tear at anterosuperior quadrant of the acetabular labrum with an extremely small paralabral cyst; mild degenerative change at the hip joint, chondral loss from the femoral head peripheral to the fovea and minor chondral fissuring at the acetabulum laterally; gluteus minimus and medius tendon pathology, more pronounced in relation to the anterior fibres of gluteus medius markedly tendinopathic.
	Nancy	Female	40	24.6	2	Paid employment	19	72	Partial labral tear involving the superior labrum. Mild iliopsoas bursitis. Low grade iliopsoas muscular strain.
	Owen	Male	41	32.9	6.5	Paid employment	22	61	Partially reducible fat containing inguinal hernia. Gluteus medius tendinopathy with mild thickening trochanteric bursa; mild bony protuberance at femoral head/neck junction suggestive of early CAM.
	Paige	Female	57	34.2	16	Paid employment			Tear of anterosuperior and posterosuperior portions of the labrum with intralabral cystic change. Mild osteoarthritis of hip joint and synovitis. High grade partial thickness tear of the gluteus minimus tendon.

*iHOT and Örebro: 0 to 100, higher is better; Abbreviations: OA = osteoarthritis; FAI = femoroacetabular impingement; CAM = type of femoroacetabular impingement; Note: information under 'Diagnostic imaging reports' column are verbatim "quotes" sourced from ultrasound, magnetic resonance and computed tomography imaging reports.

Participants reported they had engaged in the health system and had consulted with multiple HCPs including general practitioners, orthopaedic surgeons, radiologists, physiotherapists, exercise physiologists, chiropractors, nurses, natural medicine and regenerative medicine consultants. The outcome of the analytic process is presented in Table 2. Four key themes were identified: 1. 'Lay' versus 'informed' perceptions of cause; 2. 'Fissures and tears': the use of the diagnostic jargon 3. 'Fixing damage' and 'controlling symptoms'; and 4. Exercise, sleep and the threat to mental health. Each theme is described below, with supporting quotes presented in Table 3. Themes are further illustrated within the Common Sense Model(11) in Figure 2.

Table 2. Outcome of analytic process

Categories	Codes	Themes
Interpretation	Personal description of symptoms	'Lay' versus 'informed' perceptions of cause
	Previous experiences of hip pain	
	Meaning of symptoms	
	Medical history	
Cause	Activities/movements associated with onset	
	Associated condition, anatomy or injury	
	Traumatic injury	
	Ageing processes	
	Weakness	
Identity	Labels or diagnosis	'Fissures and tears': the use of the diagnostic jargon
	Diagnostic imaging	
	Diagnostic uncertainty	
Controllability	Activities/movements associated with flare ups	Controlling symptoms and 'fixing damage'
	Predictability of pain	
	Treatment expectations	
	Coping strategies	
	Self efficacy	
Action and appraisal	Behavioural modification	
	Care seeking experience	
	Filed treatments	
	Successful treatments	
Timeline	Recovery expectations	Exercise, sleep and threat to mental health
	Future hip replacement	
Consequences	Physical impact	
	Functional impact	
	Emotional impact	
	Social impact	
	General impact	
	Sleep	

Contextual life stressors	Mental health Stressful life events

1. 'Lay' versus 'informed' perceptions of cause (Table 3, quotes 1-9)

A range of perceived causes were reported. Common to the narratives of eight participants was a history of high intensity physical activity, either in their younger years (Q1) or leading up to onset of hip pain. Ten participants believed their hip pain was caused by excessive exercising or altered movements (Q2). Another eight participants believed their hip pain may have been attributed to their previous history of persistent low back pain (Q3). The experiences of younger participants could be differentiated from older participants who perceived that hip pain was a normal part of ageing (Q4). Often multiple causal attributions could be identified in participants' narratives. For example, one participant attributed her hip pain to lifting young children; muscle loss following cancer treatment; and a leg length discrepancy 'diagnosed' by a chiropractor (Q5)

All participants had widely sought care for their hip pain from various HCPs. Participants appeared to differentiate between what they thought was the cause of their pain ('lay' perceptions) and what HCPs had told them was the cause of their pain ('informed' perceptions). Sometimes 'lay' and 'informed' perceptions of cause conflicted (Q6). 'Lay' perceptions of cause were favoured over 'informed' perceptions of cause when they made more sense in the timeline of pain (Q7) or when informed causal attributions provided little hope of 'fixing' the problem. This was particularly the case for three women who reported their HCP telling them that tendons can 'spontaneously' break down in women over 50 (Q8). Conversely for some, 'informed' perceptions of cause were favoured over 'lay' perceptions when they provided more hope of getting control over pain. This was illustrated by one participant who had thought that her hip was caused by the sexual abuse she had suffered in the past until a HCP suggested that it was caused by a previous back injury (Q9).

2. 'Fissures and tears': the use of the diagnostic jargon (see Table 3, quotes 10-13)

All participants had undergone multiple diagnostic imaging, usually a radiograph, CT scan and MR imaging. When describing the imaging findings, the participants used precise diagnostic medical terms. They used anatomical terms such as 'acetabulum', 'gluteal muscles' and 'labrum'. They used terms such as 'fissuring' and 'tearing' to describe how the tissue in their hip structures were 'damaged' (Q10). Many participants perceived that the imaging findings could explain the symptoms they were experiencing. For example, one participant described how she had always felt like something was catching in hip, and the torn labrum seen on the MR images provided her with

a way to make sense of this symptom (Q11). While some participants were reassured to receive a diagnosis that could explain their symptoms, others found it frightening to receive imaging reports detailing so many things wrong with their hip (Q12). Only a couple of participants believed that the imaging findings did not satisfactorily explain their symptoms and felt that they needed more invasive investigation (Q13).

3. Fixing damage and controlling symptoms (see Table 3, quotes 14-24)

Participants differentiated between strategies to 'fix the damage' and 'control the symptoms' (Q14). Most were optimistic that their 'damaged' hip structures could be 'fixed', and despite almost all having done physiotherapy directed exercises in the past, most believed they would benefit from further 'strengthening' their hip and core muscles. In particular, participants who perceived their hip to be 'unstable' believed strengthening exercises were the key to fixing their problem (Q15). Four participants suggested that stem cell technology had the potential to regenerate their damaged tissue and resolve their condition; two had already undergone stem cell injections. One participant was optimistic that the recent stem cell injection would 'knit' the labral tear together (Q8), while another described feeling disappointed when the second plasma injection did not provide him with the pain relief he experienced with the first (Q16). Five participants believed that a future hip replacement was inevitable because there was nothing else that they could do to address the underlying structural abnormality (Q17) or because they felt they had exhausted all non-surgical treatment options (Q18).

Older participants felt that they needed to accept that they were not as young as they used to be (Q19). Most participants controlled their symptoms through avoiding the activities and movements that they believed would aggravate their symptoms (Q20). When avoidance was not possible, they described attempts to modify their behavior during these activities and movements (Q21). Two participants had gone to extreme lengths, learning alternative therapies such as self-administered needling in order to control their symptoms (Q22). Almost all participants had undergone cortisone injections, but these had failed to provide sustained relief (Q23). The repeat experience of failed treatments took a psychological toll on the participants, with many describing feelings of distress associated with 'not knowing what else to do' to get control over their symptoms (Q24).

4. Exercise, sleep and the threat to mental health (see Table 3, quotes 25-28)

For many participants, exercise had played a central role in their lives and was seen as fundamental to their psychological wellbeing. Seven described how their inability to exercise threatened their mental health (Q25). The perceived consequences of being unable to exercise included irritability

and frustration as well as worry about one's general health. One participant who had survived cancer, described her fear that the cancer could return if she didn't maintain a high level of exercise (Q26). Three participants were particularly concerned that their inability to exercise would exacerbate their underlying mood disorders (Q27). Eight participants experienced pain at night which awoke them from sleep. A lack of sleep impaired emotional wellbeing by sparking a cascade of consequences including inability to concentrate and participate in paid work, and disrupted relationships (Q28).

Table 3. Supporting quotes

Theme 1. 'Lay' versus 'informed' perceptions of cause	
Q1	"*I have a history of being quite athletic, a dancer, for a lot of my developmental years. I do have hypermobility*" (Fleur)
Q2	*"I thought maybe it's because I was cycling more. I was trying to cycle every day 20, 25 kms …And I was trying to do more*" (Paige)
Q3	*"My back was just terrible, and it just escalated over the years… It was just getting progressively worse down the nerve down the leg."* (Owen).
Q4	*"It's because I am getting old"* (Karen)
Q5	*"I had grandkids a few years ago and whether that might have exacerbated it. I've also had cancer and lost a lot of muscle tone. It's also been suggested I've got one leg longer than the other, some say yes, some say no. I don't know" (Brooke)*
Q6	"*All the scans of everything seem to think that the sporting injury actually really isn't that related to what I've got…The doctors have said I was due to get it because of the structure of where my body is sitting as far as my spine and hip"* (Nancy)
Q7	*"I know everything the doctors have said to me but it just seems too much of a coincidence that it all happened after (the slip*)" (Nancy)
Q8	*"Unfortunately, they see a lot of women over 50 who suddenly developed this. He said it is the tendon breaking down, degenerating. They said they didn't think that anything causes it, it just spontaneously happens in women over 50. I'm just getting old and breaking down and there is nothing I can do about it"* (Ana)
Q9	"*Well maybe it happened during sexual abuse, maybe damage happened ... How can the hip end up with five different things wrong with it, and all pretty significant things*? (…) *But the doctor examined me and said the hip's painful, he didn't dispute that, but he thought the problem was the lower back. As soon as he said that, I remembered that I had taken a fall at yoga and I'd fallen on a wall hook that stuck out from the wall about. I started putting the pieces together and thought oh, well I can work with that information. That's where I feel like I've got a bit of power back and I could start actually doing something with the hip"* (Chloe)

Theme 2. 'Fissures and tears': the use of the diagnostic jargon	
Q10	"*There's fissuring in every single muscle: the obturator internus and externus, the glute max, the glute min are both very distressed. Then the head of the femur is leaking bone marrow into the hip joint, which is causing a lot of inflammation in the hip, and the acetabulum has fissures in it as well. I assume that's what's flipping and causing me the instant pain*" (Chloe)
Q11	"*All I could say was that it felt like it was catching. Until I had the MRI and was able to identify that there was some shredding, and some tears, and a stretching, the labral stretching*" (Fleur)
Q12	*"To read, essentially, four things that were in that one area, well two locations, but one area of my body let's say, sort of one hand-span, I guess. All that stuff was going on in that area. It was really, really frightening and scary*" (Jane).
Q13	"*There's a part of me that just wants to go in and say, "Look, you know what? Why don't you just go and open me up and have a look?*" (Ian)
Theme 3. Fixing damage and controlling symptoms	
Q14	"*I have to find a way to either deal with it or fix it*" (Dawn)
Q15	"*If I can strengthen around it and if I can improve my core stability and the way that my hip works, then maybe I can decrease some of the laxities that I have*" (Mia)
Q16	*"The plasma injection - the first time it worked brilliantly…for three months, maybe even six months! Then it came back again. My general practitioner said I could expect that to happen, and he wanted a couple, maybe two or three goes. And so when I had to go back for the second one, it did nothing at all. He said "Don't waste your money. We're not doing it anymore*" (Liam)
Q17	"*He said almost every patient that he has seen that has exact same sort of tilted pelvis between the ages of 40 and 50 have to have hip replacement. So, I've made it, turned 46!"* (Dawn)
Q18	"*Over these two years, I've tried everything. I've tried to be so proactive and I think at the point, I'd reconciled the idea of a hip replacement because nothing I've tried has worked for me*." (Nancy)
Q19	*"I guess that I just have to accept it. I don't like it. But you just have to get old gracefully!*" (Karen)
Q20	*"Try to avoid, avoidance is the keyword... Avoid doing what makes it hurt*" (Karen)
Q21	"*It doesn't necessarily stop me from doing the activity, it's more in terms of the general avoidance. If I can't avoid it, I'll still do it, but try to do it differently"* (Grant).
Q22	"*I buy my own 75 mil acupuncture needles, and then just pop them in every so often…it is helping with pain management*" (Ian)

Q23	*"After the first lot of injections, I thought it was good as gone. But then it came back, and I thought, I'm stuck with this"* (Karen)
Q24	*"I don't have a mental issue with it but every now and then, you think you've fixed it, found the problem and you find two or three weeks later it hasn't recovered. So I don't know what to do"* (Brooke)
Theme 4. Exercise, sleep and the threat to mental health	
Q25	*"Anything that I do physically helps me mentally... If I don't get to exercise for three or four days... I need to do something"* (Ian)
Q26	*"I guess that worries me a bit underneath it all because one of the big things with cancer you have to do a lot of exercise*" (Brooke)
Q27	*"I've got a mood disorder, so activity is quite a big factor in terms of the therapy regime. So it's quite frustrating that I can't do any cardiovascular exercise. I think my biggest fear is that they tell me "you'll never be able jog again or never be able to do really cardio again," because that's the only real way to actually manage my mood disorder*" (Grant)
Q28	*"(If I could have) less pain, I'll then get more sleep, which means I'll then be more alert, and I can be physically more active, and then that will have a reinforcing effect on being able to sleep better, and I will have a fuller, more productive life. I'll be happier. So it's a chain reaction*" (Helen)

DISCUSSION

This qualitative study explored how patients seeking care for persistent hip pain made sense of their symptoms.

Making sense of persistent hip pain through a biomedical lens

All participants made sense of their pain through a biomedical lens. They believed that hip pain and disability were due to 'damaged' hip structures; 'degeneration', 'fissures', 'tears', 'detachment' and/or 'arthritis'. Participants reported that these beliefs derived from a combination of diagnostic imaging reports and information provided by HCPs.

Some participants believed their 'damaged' hip structures were caused by physical activity, loading and/or an injury, many reported being told by HCPs that their 'damage' had been caused by 'faulty biomechanics' and aging. These findings are similar to reports among people with knee osteoarthritis(18, 24) and LBP.(25-27) The belief that structural pathology based on radiological imaging is an accurate measure of a person's pain experience is common at a societal level and amongst HCPs.(28, 29) This is despite evidence that levels of pain and disability do not correlate closely with radiographic findings in people with hip pain,(8) that 'pathology' is prevalent in

asymptomatic populations,(30) and that informing patients of imaging findings can lead to poorer health outcomes.(31)

This biomedical lens appeared to influence the participants' coping responses. The participants attempted to limit further damage and control their pain through activity avoidance and movement modification, such as avoiding squatting movements, adopting an antalgic gait, or using upper limb strength to push themselves up from a sitting position or lift themselves out of a car. Activity avoidance and modification due to fear of doing more damage has also been reported among people with persistent LBP (e.g. avoiding "bending" their back or pacing activities) and knee osteoarthritis (e.g. avoiding/pacing activities or choosing activities believed to cause less damage, such as cycling).(18, 24, 32) Research has demonstrated a relationship between negative pain beliefs, greater functional disability and motor control impairments in people with LBP (33) and knee arthritis,(34, 35) further highlighting the interplay between cognitive factors and coping responses to pain.

Although some participants in this study believed they could 'fix' or 'control' the 'damage' to their hips through strengthening exercises, stem cell treatment and steroid injections, previous attempts to do so had failed to provide long-term benefit. These 'failed treatments' reinforced the belief among some participants that the damage to their hip structures was irreversible and that a hip replacement was inevitable. The belief that a joint replacement is the only definitive 'cure' for painful joints is common among older people with lower limb osteoarthritis and HCPs, and may underlie low referral rates and low adherence to effective non-surgical management options.(36-38) The repeated experience of 'failed' treatments has been suggested to play a role in symptom incoherence (an inability to make sense of pain) and the development of pain-related fear in people with musculoskeletal pain.(33)

Peoples' experiences of persistent hip pain were described through a biopsychosocial lens

The biomedical lens through which the participants in this study made sense of their pain, contrasts with the biopsychosocial lens through which they experienced pain. The participants in this study perceived that disrupted sleep and an inability to engage in physical activity threatened their physical and mental well-being, by increasing emotional distress, frustration and compromising their ability to cope. The bidirectional relationship between depression, sleep and persistent musculoskeletal pain is well documented.(39, 40) Furthermore, the interaction of disrupted sleep, depression and reduced activity contributes to vicious cycle of pain, distress and disability.(4, 40) By

illustrating the role of biopsychosocial factors influencing a person's hip pain and disability, these findings strengthen calls to action to change the prevailing biomedical paradigm and reduce reliance on imaging as a sole explanation of a person's pain experience.(19, 36, 41)

CLINICAL IMPLICATIONS

To facilitate this change in paradigm, the use of the CLEAR principle when reporting on imaging has been advocated: 1.*Consistent language*: the use of minimally threatening language so as not to create fear, 2.*Epidemiological information* using age-matched findings for asymptomatic populations and 3. *Assessment of relevance*: explaining that imaging findings must be considered with clinical features.(42) In addition, recent guidelines recommend the screening and assessment of biopsychosocial factors including pain beliefs and concerns, fear, depression, social context, sleep, obesity as well as physical activity levels and strength in people with musculoskeletal pain.(36, 43) Where persistent musculoskeletal pain presents with health comorbidities such as obesity, sleep and or mental health disorders, multidisciplinary care is recommended.(19, 36) However, all patients presenting with musculoskeletal pain can benefit from education regarding the multidimensional complexity of musculoskeletal pain. Highlighting the important role that modifiable risk factors such as beliefs, physical activity, sleep and weight management play in their pain disorder, provides opportunities for self-management.(44) Recent research supports the long-term benefits of interventions that target these factors in people with hip and knee pain.(45-47) Table 4 provides examples of alternative health messages that aim to facilitate positive health behaviours.

Table 4. Suggested alternative health messages when communicating with people with persistent hip pain.

Health messages reported by participants in the study linked with unhelpful health behaviours	Alternative evidence-based health messages that aim to promote positive health behaviours for people with hip pain
Your hip pain is due to damaged structures in your hip joint (e.g. labral tears, arthritis)	'Pathoanatomical' changes such as labral tears and hip joint arthritis are common in pain-free populations.(30) This means that other factors are also important to explain hip pain. Pain in the hip structures is influenced by multiple factors such as sleep, fatigue, mood, strength, physical activity and body weight.(40) Many of these factors are influenced by things you can do for yourself. We can make a plan to address these.
Hip tendons spontaneously break down in people over 50… loading them will damage them further	'Pathoanatomical' changes relating to the hip tendons are common in pain-free populations. Tendon health is influenced by lots of factors such as muscle strength, engagement in physical activity, psychological health and levels of obesity.(48, 49) Addressing these factors can keep tendons healthy with aging. It is important to know that it is safe and helpful to engage in graduated exercise with tendon tears – rest and activity avoidance is unhelpful.(43)
Your hip is unstable and needs controlling and stabilising	Hip joints are very stable structures.(50) Maintaining muscle strength and mobility around the hip is important for joint health, while guarding and holding muscles tense can be unhelpful.
Being too lordotic can lead to wear/arthritis on your hips	There is no evidence that spine and pelvis posture predicts hip arthritis. People have a range of postures and body shapes and the body can learn to adapt to movement and load.
Engaging in weight bearing and loaded exercise will damage the hip structures more	Engaging in graduated weight bearing exercise is safe and does not damage the hip structures in people with osteoarthritis.

	In fact exercise is important to maintain the health of your joint.(51)
With your damaged / arthritic hip structures a joint replacement is inevitable	Developing an understanding of your hip pain, building confidence to move, getting strong and active, as well as maintaining a healthy body weight, can reduce pain, disability, need for medication and in many cases the need for surgery.(43)
I think we better get you on some antidepressants to manage your mental health, as exercising vigorously like you used to in order to manage your mental health isn't safe for you now	Physical activity is important for mental health.(52) Exercise is safe as long as it is graduated, and has huge health benefits.(51)
You need a cortisone injection for your hip pain	While cortisone injections can provide short term pain relief for some people, the effects don't last,(53, 54) and may increase osteoarthritis progression especially when repeated.(55) Understanding the factors linked to your pain, building confidence to strengthen your hip, becoming active and managing your weight is a more effective way to manage your pain in the long run.(43)

DESIGN CONSIDERATIONS

We authors are interested in cognitive behavioural interventions for musculoskeletal pain. We selected the Common Sense Model(11) as a validated framework to explore how people make sense of their musculoskeletal symptoms. As is inherent to qualitative research, our lens (*world view*) necessarily influenced the design and conduct of this study. Thus, alternative interpretations to those presented in this paper are possible. By declaring our lens, providing the interview schedule, code book and supporting quotes, we have attempted to leave an 'audit trail' that makes our assumptions and interpretations explicit.

While this study comprised a small convenience sample, we employed qualitative techniques to exhaust new concepts such as concurrent data collection and data analysis to enable us to explore and challenge emerging concepts in subsequent interviews. The patterns we identified among the 16 participants were sufficient to answer our research question. We acknowledge that the insights gained from this small convenience sample are of limited generalisability. To assist readers make judgements about the transferability of these findings to their own clinical settings,(56) we have provided a rich description of the demographic and clinical characteristics of this sample. Prior to enrolling in the study, the participants had all sought an opinion from an orthopaedic surgeon in a private practice setting and had agreed to participate in a physiotherapy-directed cognitive functional intervention. We did not collect demographic data on the 11 people who were referred to the intervention but declined to participate.

Did health literacy influence our study results? People who seek care from doctors in private orthopaedic practice in Australia have higher health literacy than those seeking care from the public system.(57) Whether higher health literacy influenced the beliefs of the participants in this study is uncertain. There is some evidence that people with higher health literacy hold more positive beliefs about musculoskeletal pain.(58) On the other hand, there is evidence that negative beliefs about musculoskeletal pain are, in part, iatrogenic and can arise from conflicting advice from healthcare professionals.(27, 33) Given that people with higher health literacy find it easier seek care,(59) it may be that this sample (which had widely sought care) held more negative beliefs than the wider population. While we emphasise that similar biomedical beliefs have been documented in other musculoskeletal pain populations in different healthcare settings,(18, 24, 60) future research involving larger, more generalizable samples is needed to understand how widespread the beliefs described among this sample are.(61)

CONCLUSION

Participants in this study seeking care for persistent hip pain reported negative beliefs relating to 'damaged' hip structures, which appeared to lead them to coping responses such as activity avoidance and movement modification. Participants reported subsequent psychological distress, disrupted sleep and reduced physical activity, threatening their physical and mental well-being. Targeting pain beliefs and coping strategies may provide opportunities for more effective self-management of persistent hip pain.

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Figure legends:

Figure 1. Participant recruitment

Figure 2: Making sense of hip pain within the Common Sense Model

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Supplementary Box 1. The International Hip Outcome Tool (iHOT12)

Box 1. The International Hip Outcome Tool (iHOT12)

The iHOT-12 has been developed specifically for measuring the impact of hip disease in typically more younger and more active patient cohorts than those receiving hip arthroplasty. The questionnaire captures pain, symptoms and activity impairments, scores range from 0 to 100 with lower scores representing greater impact.(20)

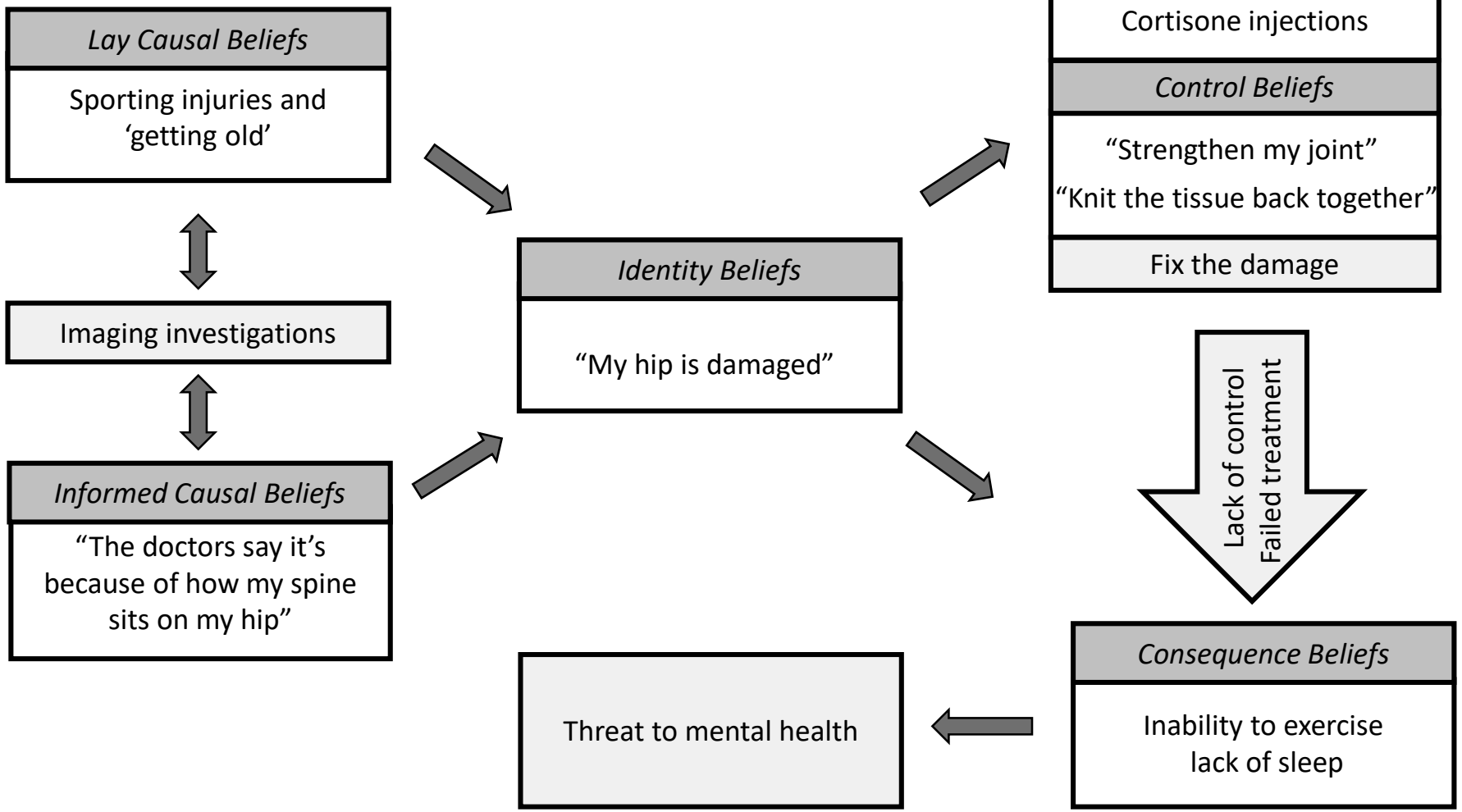
Supplementary Box 2. Örebro Musculoskeletal Pain Questionnaire Short Form (ÖMPQ-SF)

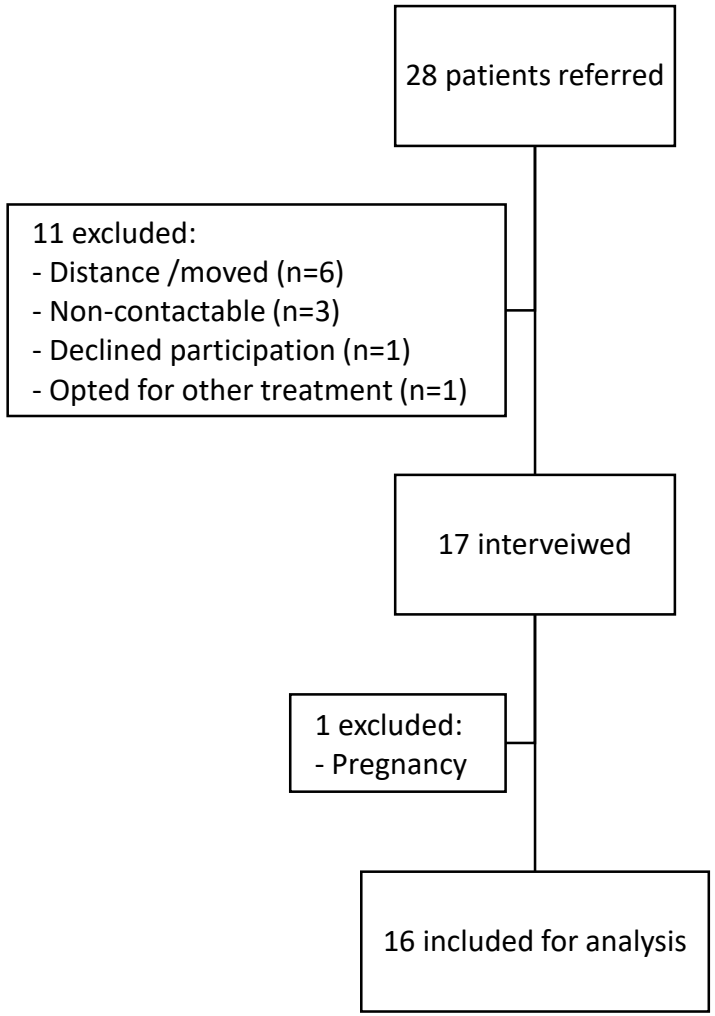
Box 2. Örebro Musculoskeletal Pain Questionnaire Short Form (ÖMPQ-SF)

The ÖMPQ-SF is a validated screening tool to assist in the identification of psychological and social factors as risks for persistence of musculoskeletal pain and disability. Scores range from 0 to 100 with higher scores representing greater risk of persistence of pain and disability.(21)

Supplementary Table 1. Interview questions

Common Sense Model Constructs	Interview Questions
Interpretation	1. Can you tell me the story about your hip pain and how it affects you?
Cause	2. What do you think is the cause of your pain? Why? 3. What do you think makes your pain flare up (triggers)? - What kind of activities catch you out? - When do you feel this pain?
Identity	4. What have you been told about your pain / what diagnosis have you been given? 5. What do you think it is? 6. What does this mean to you? 7. Do you have a picture of your hip in your head? Describe it to me.
Consequences	8. What do you think this pain is telling you when you feel it? - Is it telling you to stop what you are doing or change how you are doing it? 9. How has this problem changed your life? - What does this pain keep you from doing? (Social consequences: sports, work, family, friends) - How much does it bother you?
Timeline	10. How predictable is your hip pain? 11. How long do you think this is going to happen for? 12. Do you think you are going to get out of this situation? (Hope for recovery or loss of hope) 13. What do you think is going to happen to you in the future? (Degeneration? OA? Hip replacement?)
Control	14. Do you feel in control of your pain? 15. Do you feel confident in your hip?
Curability	16. Did you have any treatment for your hip pain? 17. How do you see your future treatment? 18. How do you want this treatment to be?
Action Appraisal	19. What do you do to try to control your pain? Why? 20. Do you try to avoid activities because of your hip pain? Why? 21. Do you think your strategies are working for you? 22. Is there anything else you think may be affecting your situation?
Emotional response to fear	23. How does your hip pain make you feel? 24. How is your overall mood? (Worried, stressed, sad, at loss, frustrated, angry) 25. How much are you worried about this? 26. What are you worried about? - Are you worried of this pain happening again? 27. Do you think this feeling of being worried affects what you do?


Lay Causal Beliefs
Sporting injuries and 'getting old'
Imaging investigations
Informed Causal Beliefs
"The doctors say it's because of how my spine sits on my hip"
Identity Beliefs
"My hip is damaged"
Control the pain
"Avoid what makes it hurt"
Cortisone injections
Control Beliefs
"Strengthen my joint"
"Knit the tissue back together"
Fix the damage
Lack of control
Failed treatment
Consequence Beliefs
Inability to exercise
lack of sleep
Threat to mental health


28 patients referred
11 excluded:
- Distance /moved (n=6)
- Non-contactable (n=3)
- Declined participation (n=1)
- Opted for other treatment (n=1)
17 interveiwed
1 excluded:
- Pregnancy
16 included for analysis

Response to Reviewers 2

Reviewer: 1

Comments to the Author

Firstly, thank you for the professional way you addressed my previous queries. Your sense of effort and dedication to improving the document is appreciated.
All my previous queries have been addressed. After reading the paper, I have no additional queries. I am left with a burning interest in the Common sense model and will look this up for further knowledge

We would like to thank Reviewer 1 for reviewing this manuscript again and for their valuable input.

Reviewer: 2

Comments to the Author

Thank you for asking me to review the revised version of this paper. I thank the authors for addressing all of the comments in a comprehensive and positive way. In particular, the following changes have improved the manuscript.
1. The addition of Table 4 (rather than a case example as suggested). This table provides the clinician reader with some concrete examples to help them reframe their language with patients in an appropriate way.
2. The addition of the information about author bias in qualitative research, in the "Design considerations" section. This transparency is very important to acknowledge.
I am happy with all the remaining revisions provided, and have no further suggestions to make.

We would also like to thank Reviewer 2 for their suggestions that helped us improve the manuscript.

Editor's comments:

Title: Needs the link to the health professional interaction here. No clue to there being an HP interaction in this title.

We agree that we need to acknowledge in the title the participants' involvement with the health system. Participants interacted with multiple health professionals prior to the study. Including **'after they had seen a health professional'** could imply interacting with a single health professional and not represent the participants' experiences accurately. Alternatively, on page 1, line 2 we propose the following title:

'My hip is damaged.' A qualitative investigation of people seeking care for persistent hip pain

Abstract: The edits recommended in the abstract improve the reading flow and were all accepted. We also changed a few words (e.g. "seeking care for" on page 3, line 6) to reflect the change in the title.

What are the Findings? How might it impact on the clinical practice in the future?: The authors agreed with all suggestions made. All revisions were accepted.

Introduction: Most changes were accepted.

Action here please (e.g. simple example of negative beliefs)
On page 5, lines 20-21, the following example of a negative belief was provided:

"(e.g. lower control over symptoms)"

Similar example

On page 5, line 22, a positive belief example was included:

"(e.g. lifestyle less impacted by the illness)"

On page 5, line 29, the addition of **'in the context of a clinical encounter'** can also imply a singular encounter when in fact participants had multiple. In line with the new title proposed, we suggest:

"Adopting a similar approach, the aim of this study is to explore how people seeking care for persistent hip pain make sense of their hip symptoms."

Data collection: Any data on health professionals seen? The orthopaedic surgeons who supported the study? Other HCPs? If not you should refer to 'orthopaedic surgeons' in the discussion. Do health professionals differ? This is an important element of this study and of interested to BJSM readers.

Thank you for the observation. We realised we needed to clarify this point as participants in this study consulted with multiple health professionals over a long period. We focused on the overall health messages participants received and used to make sense of their persistent hip pain. To clarify, we included the following sentence in page 11, lines 2-4 under the **Results** section:

"Participants reported they had engaged in the health system and had consulted with multiple HCPs including general practitioners, orthopaedic surgeons, radiologists, physiotherapists, exercise physiologists, chiropractors, nurses, natural medicine and regenerative medicine consultants."

Analysis: What does patterns mean here? Bit meaningless to naïve reader. What are you saying? 'Patterns within and between among codes were identified and emerging interpretations were discussed and challenged among the multi-disciplinary research team comprised of academic and clinical physiotherapists, orthopaedic surgeons, and qualitative researchers.'

In order to explain this section, we re-wrote this sentence on page 7, lines 30-32 and page 8, lines 1-2:

"Reoccurring codes within and among codes were identified and emerging interpretations were discussed and challenged among the researchers in this study with different professional backgrounds: clinical physiotherapists (AS, PO, SH and SB), orthopaedic surgeons (DF and RK), and physiotherapists with expertise in qualitative designs (BO and SB)."

Results: All revisions were accepted and changes were applied.

On page 16, line 3, we made a small modification to the first sentence according to the new title:

"This qualitative study explored how patients seeking care for persistent hip pain made sense of their symptoms."

On page 8, line 12, we included "chondral damage" and "tears" to the most common diagnostic image findings to highlight their relevance.

Discussion:

I encourage you to use two additional subheadings in the Discussion so that you end up with 3 in total.

We added the following sub-headings:

On page 16, line 5:

"**Making sense of persistent hip pain through a biomedical lens"**

On page 17, line 24:

"**Peoples' experiences of persistent hip pain were described through a biopsychosocial lens**"

I don't see how this ("Participants were aged between 33 and 73 years, 12 out of 16 were women, and all were highly educated, with moderate-high levels of both disability and pathoanatomical findings on imaging."**) adds value in the discussion. What your study means? Why is this included here?**

We agree with this comment and deleted this sentence.

Does your study design allow you to conclude this? ("These beliefs were commonly derived from a combination of diagnostic imaging reports and information provided by HCPs")

This was reported by participants of this study, thus we changed the sentence on page 16, line 8, to:

"Participants reported that these beliefs derived from a combination of diagnostic imaging reports and information provided by HCPs."

Clean this sentence, not perfect: "Similar 'damage' beliefs perpetuated by imaging findings and HCP advice have been reported among people with knee osteoarthritis(18, 24) and LBP.(25-27)"

This sentence was substituted on page 16, lines 12-13, by:

"These findings are similar to reports among people with knee osteoarthritis(18, 24) and LBP.(25-27)"

Table 4: How do you know these are unhelpful? Where are the references?

That is a valid observation. To align Table 4 with our findings, we made the following changes:

In-text on page 18, lines 19-20, we changed the description of the table:

"Table 4 provides examples of alternative health messages that aim to facilitate positive health behaviours."

On page 19, line 1, the table legend was altered to:

"Table 4. Suggested alternative health messages when communicating with people with persistent hip pain."

The left-hand column description was changed to reflect the findings of our study and the right-hand column description was changed to emphasise evidence-based health messages:

Left hand column description:
"Health messages reported by participants in the study linked with unhelpful health behaviours"

Right hand column description:
"Alternative evidence-based health messages that aim to promote positive health behaviours for people with hip pain"

In Table 4, two sentences were slightly rephrased for to express their meaning better:

"People have a range of postures and body shapes and the body can learn to adapt to movement and load."

"Developing an understanding of your hip pain, building confidence to move, getting strong and active, as well as maintaining a healthy body weight, can reduce pain, disability, need for medication and in many cases the need for surgery.(43)"

One more piece of information and the reference for it was added in Table 4 as it is important for patients:

"While cortisone injections can provide short term pain relief for some people, the effects don't last,(53, 54) and may increase osteoarthritis progression especially when repeated.(55)"

Design Considerations: All revision were accepted.

Conclusion:

How did you judge 'effective' / ineffective?

We deemed the coping strategies ineffective as participants reported high levels of pain and disability during the study. However, this could be an assumption and we decided to delete the word "ineffective" to remove any leading sentences and altered the sentence on page 22, lines 2-3:

"Participants in this study seeking care for persistent hip pain reported negative beliefs relating to 'damaged' hip structures, which appeared to lead them to unhelpful coping responses such as activity avoidance and movement modification."

Compared with what baseline? How do you know this? ("This led to increased psychological distress, disrupted sleep and reduced physical activity, threatening the physical and mental well-being of the participants."**) Increased means change over time.**

To correct this, the word "increased" was deleted and substituted on page 22, line 4 with:

"Participants reported subsequent psychological distress, disrupted sleep and reduced physical activity, threatening their physical and mental well-being."

Eliminate ‘zombie nouns’

In the last sentence of the Conclusion, ‘The identification of’ and was deleted.