

## Patient experience of the diagnosis and management of patellofemoral pain: A qualitative exploration

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### ABSTRACT

**Background:** Patellofemoral pain (PFP) is common and long-term treatment outcomes are unsatisfactory. Qualitative exploration of diagnosis and management from the perspective of people with PFP is lacking.

**Objectives:** To inform care and improve intervention delivery by exploring the experience of people with PFP regarding diagnosis and management.

**Design:** Qualitative study with semi-structured interviews.

**Method:** Online recruiting yielded a convenience sample of participants with PFP for semi-structured interview. Interviews were recorded, transcribed verbatim, and analysed using thematic analysis until theoretical saturation by multiple investigators to determine themes and sub-themes.

**Results:** 12 participants were interviewed, with three themes identified; the value of diagnosis, the need for tailored (individualised) care, and the role of education. Participants viewed receiving a diagnosis as essential to guide management, yet one was rarely provided, causing uncertainty about pain mechanisms; **“it’s nice to be told what it is that’s wrong”**. Interventions needed to be tailored to the individual as not all participants responded in the same way to treatment(s) or had the same needs; **“everyone copes and reacts differently”**. Finally, participants viewed education as essential to empower them to understand and manage the condition; **“if I’d have been given more information, I think I’d know how to deal with it more”**.

**Conclusions:** The overarching narrative from three themes was a desire for clearly communicated personalised care that meets individual needs. People with PFP desire a diagnosis to explain their pain, tailored interventions, and appropriate education to optimise their experience and outcomes.

### 1. Introduction

Patellofemoral pain (PFP) is characterised by insidious onset retro-and/or peri-patellar pain, aggravated by loading a flexed knee (Crossley et al., 2016a). PFP affects 22.7% of the United Kingdom population (Smith et al., 2018b), has a poorly understood aetiology (Neal et al., 2019), and affects occupational, social, and sporting activities (Crossley et al., 2016a). Research aimed at managing PFP is primarily quantitative (Smith et al., 2018a), with randomised control trials of varying

methodological quality (Kedroff et al., 2019) recommending addressing the biomechanical impairments associated with PFP (Vicenzino et al., 2019). Despite the strength of this research PFP has a poor prognosis, with >50% of people reporting persistent pain five years post-treatment (Lankhorst et al., 2016).

One proposition to improve outcomes in PFP is to apply a biopsychosocial (BPS) approach, focusing on holistic care (Sanchis-Alfonso et al., 2015) rather than traditional biomechanical methods (Barton et al., 2018). The focus should be the person, rather than their painful

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joint, understanding their personal experience and impact on their life (Vicenzino et al., 2019). Other factors that influence PFP, such as fear and anxiety, should also be addressed (Bunzli et al., 2013). There is a paucity of qualitative research on the lived experience of people with PFP (PwPFP), with research focusing on pathophysiological causes despite patients' concerns about the impact of pain on their quality of life (Robertson et al., 2017).

Qualitative research provides rich insight into patient experiences (Braun and Clarke, 2014), allowing a greater understanding of the factors influencing these experiences to inform healthcare provision (Gelling, 2015). Two qualitative studies on the lived experience of PwPFP have been conducted (Robertson et al., 2017; Smith et al., 2018a), reporting a loss of self-identity (Smith et al., 2018a) and fear avoidance due to crepitus and pain (Robertson et al., 2017; Smith et al., 2018a). The negative experience of living with PFP was compounded by uncertainty about the cause of pain (Robertson et al., 2017; Smith et al., 2018a), conflicting advice (Smith et al., 2018a), and an overall lack of empathy (Robertson et al., 2017; Smith et al., 2018a). These studies focussed on exploring living with PFP, rather than understanding patients' experience of their diagnosis and treatment.

The high prevalence and poor prognosis demonstrate a clear need to optimise PFP management. This study aimed to inform care and intervention delivery by exploring patient experiences of the diagnosis and treatment of PFP using semi-structured interviews.

## 2. Methodology

### 2.1. Design

A qualitative study using semi-structured interviews following the Standards for Reporting Qualitative Guidelines (SRQR) (O'Brien et al., 2014) was conducted.

#### Ethical approval

The Queen Mary Ethics of Research Committee granted approval (QMERC/2018/48,036). All participants confirmed eligibility and provided written informed consent prior to interview using Google Forms (Google Inc., California, USA).

### 2.2. Recruitment

A convenience sample of potential participants were recruited online via social media. Participants were eligible if they met the diagnostic criteria for PFP (Crossley et al., 2016b), including insidious onset retro-and/or-peri-patellar pain reproduced by one or more of the following: squatting/lunging, running, jumping/hopping, or stair ambulation (Crossley et al., 2016b). Eligible participants also needed experience of treatment for their PFP, speak fluent English, and be aged between 18 and 40. Participants aged <18 or >40, or those with traumatic symptoms, patellar instability, intra-articular pathology, systemic pathology, or a diagnosis of other anterior knee pain sources were excluded. Sample size was revisited during data collection in an evaluative way (Braun and Clarke, 2016) and theoretical sufficiency (Dey, 1999) guided when sufficient data were collected.

### 2.3. Data collection

Eligible participants completed an online, one-to-one interview with a single investigator (PB) using Zoom video (San Jose, California, USA). Interviews were semi-structured with open-ended questions and followed a topic guide developed based on input from a patient and public involvement group at the design stage. Dependability was enhanced by a reflective researcher self-audit, completion of a reflexive journal, and use of a peer-reviewed topic guide (Koch, 2006).

The topic guide (see appendix 1) included questions about living

with PFP, assessment and diagnosis, educational material and resources, treatment provided, and the future. Questions related to lived experience were included to understand the impact of PFP treatment.

### 2.4. Data analysis

Interviews were audio recorded, anonymised, and uploaded onto a password-protected online transcription software Otter.Ai (Los Altos, California, USA). Files were removed once the computer-generated transcription was produced for data protection. Audio files were transcribed verbatim and error corrected by a single investigator (PB). PB is a physiotherapist with 15-years' experience, working as the clinical lead in a musculoskeletal service that covers a large geographical area in southeast England not used to facilitate recruitment.

Data were analysed under the constructivist paradigm, as its central endeavour is to study phenomena through the eyes of people in lived situations (Dey, 1999). Thematic analysis was used, moving backwards and forwards through the six-phase model of Braun and Clarke (2006) (see Fig. 1), chosen to understand participant experiences and patterns of meaning across the dataset (Clarke et al., 2016).

Transcriptions were read multiple times for familiarisation and generation of preliminary ideas. Data were coded by the lead author (PB), which involved theme development, naming, and refinement. Peer review on interview technique, early coding, and theme development was provided by a single investigator (CML). Data collection and analysis was performed iteratively to deepen the richness of the findings (Clissett, 2008). A single investigator (CB) independently verified all codes and themes against the transcripts. Contradictions to the findings (Morse et al., 2002) and verbatim quotes (Greenhalgh, 2014) were included to enhance rigour.

## 3. Results

### 3.1. Participants

37 participants volunteered for this study, with 14 failing to meet the eligibility criteria (sudden/traumatic onset symptoms = five, aged >40 = two, incorrect aggravating factors = one, yet to receive treatment = six). A further 11 participants did not respond to repeat invitations to interview. Twelve PwPFP, seven women and five men, with a mean age ( $26.5 \pm 4.7$ ) and symptom duration ( $43.3$  months  $\pm 42.3$ ), living in England (eight), Europe (one) and North America (three), were interviewed between June and August 2020 (see Table 1), ranging from 45 to 80 min. The final two interviewees reported no new information and theoretical sufficiency was deemed achieved.

### 3.2. Thematic analysis

Three themes and nine sub-themes were devised from 801 initial codes, which are detailed here and mapped in Fig. 2.

#### 3.3. Theme one: the value of diagnosis

Over half the participants reported clinicians infrequently discussing a diagnosis or providing an explanation for their pain:

*"Basically no one told me, oh ... that's the main reason for it"* (participant J)

*"They were like, this is a problem, we don't really know what causes it ... we can't really tell you exactly what it is"* (participant K)

The lack of a cause was viewed as a barrier, facilitating biomedical beliefs:

*"The main problem is that uncertainty in diagnosis"* (participant T)

*"I think it's some sort of cartilage damage"* (participant N)

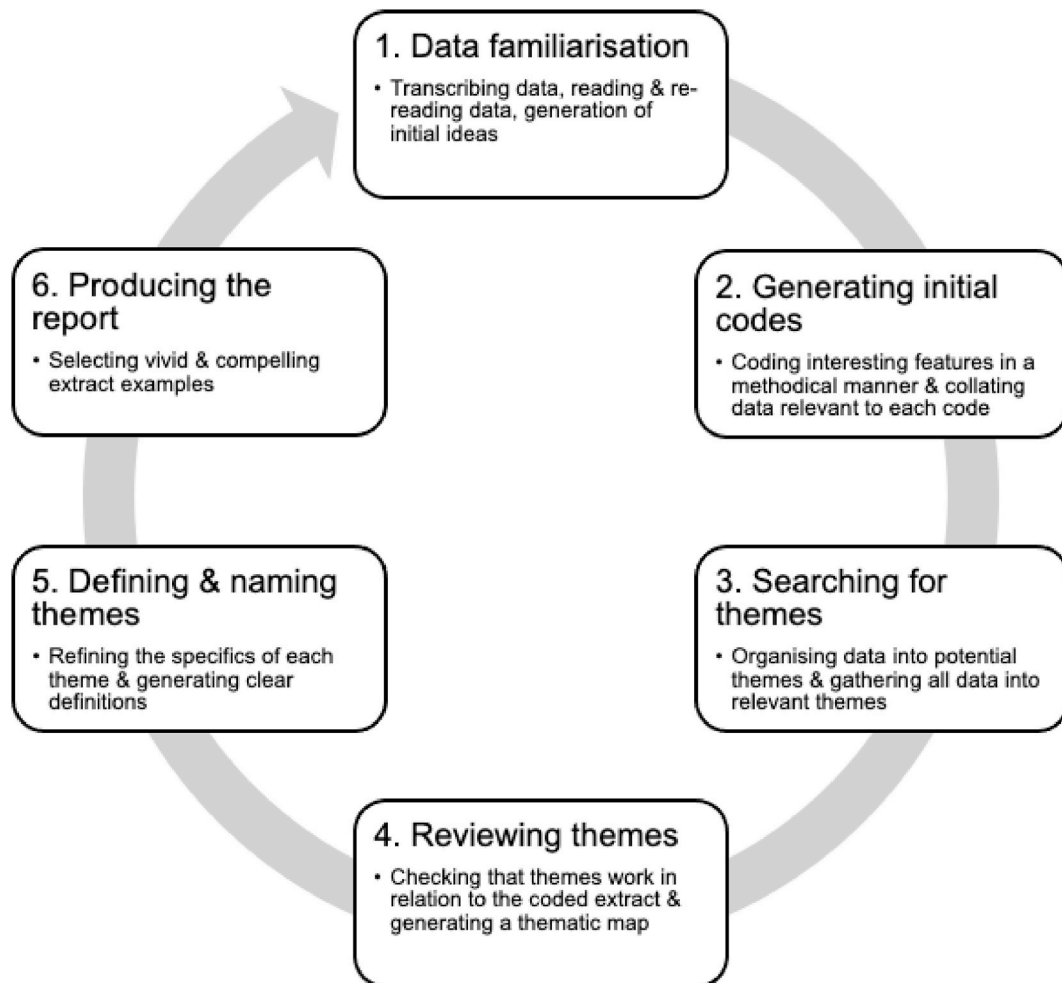


Fig. 1. Six-phase model described by Braun and Clarke.

This perception of faulty structures hindered recovery, with faith placed in diagnostic tests for reassurance and prognosis:

*“I’m thinking is there damage structurally I’m not gonna fully recover from. So that’s kind of why I would like to know”* (participant D)

*“the fact that you have an MRI and it’s, it’s thorough, I think as a patient it gives you peace of mind”* (participant N)

However, a lack of diagnostic findings created confusion and feeling disbelieved by clinicians:

*“It was confusing at the time; I knew what I felt. I know when it’s not in my head ... I know that sometimes MRIs look perfectly fine, but pain is there”* (participant T)

Only four participants reported receiving a diagnosis, often delayed if seeing a physiotherapist versus an orthopaedic consultant, with a subsequent negative emotional impact:

*“It was quite frustrating because since July last year until end of May this year, I didn’t know the cause”* (participant L)

A diagnosis was desired by participants, believing it was necessary to facilitate resolution and legitimise their pain:

*“The first step is that certain diagnosis ... when you have that you’re halfway”* (participant T)

*“It was helpful, because sometimes it’s nice to be told what’s wrong. So, you know it can be fixed ... helps you feel validated”* (participant B)

Conversely, one participant learned that a diagnostic label wasn’t key to their recovery. They instead found gaining knowledge through biopsychosocial explanations more useful:

*“Now I realise that having a name is not that important to get better, it’s more understanding what’s wrong and a more holistic kind of view”* (participant L)

FPF was the commonly used diagnostic label, but half the participants felt it was not specific enough to provide them with an understanding of their pain:

*“It’s very frustrating because I feel like it’s, in my sense, it’s kind of a blanket response”* (participant K)

In contrast, one participant was content with a general explanation, finding this more understandable than confusing medical terms, highlighting individual preferences:

*“I don’t know why they just don’t say kneecap pain”* (participant A).  
Two participants stated they were given a diagnosis of patellofemoral syndrome, which had negative connotations:

*“Is it some sort of a disease if it’s a syndrome”* (participant D)

*“He was like patellofemoral pain syndrome. I don’t know if that word syndrome around it makes you catastrophise a bit as well. We’ve got this syndrome now”* (participant T)

**Table 1**  
Participant information.

Participant, Sex, Age	Symptom duration	Aggravating Factors	Management	Imaging	Modalities	Outcome
J Female Age 28	12 months	Running	One course of physiotherapy (Private: UK) Orthopaedic assessment Private: UK	Nil	Exercise Foot orthoses	Full recovery
T Female Age 22	10 months	Stairs Running	Multiple courses of physiotherapy  (Private: Europe) Multiple orthopaedic assessments (Private: Europe)	MRI scan	Exercise  Foam rolling Taping	No recovery
B Female Age 28	12 months	Running Squatting	One course of physiotherapy  (Private: UK)	Nil	Exercise  Foot orthoses Knee brace Return to running advice	Partial recovery
N Female Age 27	3 years	Running Squatting Lunging	One course of physiotherapy  (Private: UK) Orthopaedic assessment (Private: UK)	MRI scan US scan	NSAIDs Exercises	Full recovery
L Female Age 23	12 months	Running	One course of physiotherapy  (Private: UK) Orthopaedic assessment (Private: UK)	MRI	Exercise/stretching  Foot orthoses Running re-training Taping	Partial recovery
D Male Age 24	3 years	Stairs Running Squatting Lunging	Multiple courses of physiotherapy  (NHS and private: UK) Orthopaedic assessment (NHS: UK)	X-ray	Exercise  Massage NSAIDs	No recovery
A Female Age 19	12 months	Stairs Running Squatting Lunging	Multiple courses of physiotherapy  (NHS: UK)	MRI scan	Exercise  Foot orthoses Surgery	No recovery
Z Male Age 35	8 years	Stairs Squatting	One course of physiotherapy  (Private: North America)	Nil	Exercise  Knee brace	Partial recovery
K Female Age 25	3 years	Stairs Running Squatting Lunging	Multiple courses of physiotherapy  (Private: North America) Multiple orthopaedic assessment (Private: North America)	MRI scan X-ray	Exercise  Hyaluronic/steroid injection Taping Massage/Acupuncture NSAIDs	No recovery
TN Male Age 25	18 months	Stairs Running Squatting Lunging	One course of physiotherapy  (NHS: UK)	Nil	Exercise	Partial recovery
F Male Age 36	12 years	Stairs Running Squatting Lunging	One course of physiotherapy  (Private: Europe) Orthopaedic assessment/treatment (Private: North America)	Nil	Exercise/stretching  Steroid injection Running re-training	Partial recovery
JA Female Age 26	8 years	Running	One course of physiotherapy (NHS: UK)	Nil	Exercise	Full recovery

Key: NHS; National Health Service, MRI; Magnetic resonance imaging, US; ultrasound, NSAIDs; Non-steroidal anti-inflammatory drugs.

**3.4. Theme two: the need for tailored (individualised) care**

**3.4.1. Non-exercise treatment approaches and outcomes**

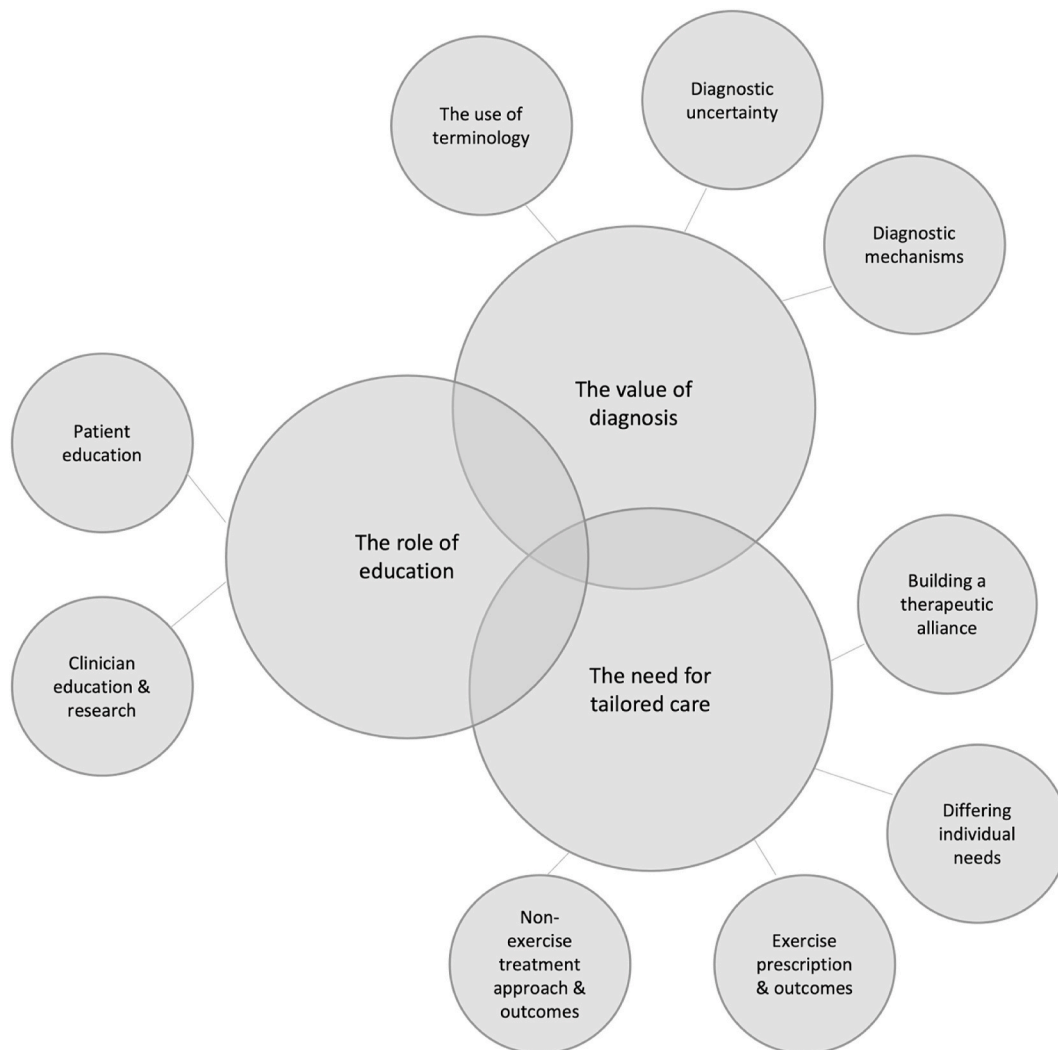
Outcomes were mixed amongst the 12 participants (see table one), with no panacea described. Eight participants had an orthopaedic assessment, but only three received orthopaedic treatment: two an injection and one surgery post-physiotherapy. One participant received a Hyaluronic acid injection and the other steroid. Both reported short-term benefit only and mixed reactions on injection usefulness:

*“Corticosteroid, it was good. Yeah, it works ... because the first one worked a lot so I’m still thinking to get another one”* (participant F)

*“I got a Synvisc injection, that was the last one I let them put in me, and that one felt good for maybe 10/11 days and then it was the same ... back at square one”* (participant K)

Non-steroidal anti-inflammatory drugs also gave some benefit to three participants:

*“Anti-inflammatories, ibuprofen to kill the pain, that kind of felt good”* (participant N)



Key: study themes (large circles) and associated subthemes (small circles)

Fig. 2. Inter-relationships between themes and associated subthemes that emerged from exploring the diagnosis and management of PFP  
Key: study themes (large circles) and associated subthemes (small circles).

All participants received treatment as part of their physiotherapy experience, but half of the participants did not make a full return to previous activity levels (see Table 1), which did not meet their expectations:

*“You get physio, you become better, that’s what’s supposed to happen. You are not supposed to keep going to physio like me”* (participant A)

Conversely, three participants reported a partial recovery, and another three reported a full recovery with physiotherapy alone. With frequent sessions, participants reported improvements in their pain:

*“And then since obviously the physio and stuff it’s better now ... So I don’t get it at the moment”* (participant N)

*“Seeing the physio weekly, eventually, that’s given me the best results”* (participant B)

Two participants experienced knee taping or bracing as part of their physiotherapy, which helped in the short-term, providing reassurance that no harm would come with activity:

*“I found that using tape is actually quite helpful”* (participant L)

*“Putting a brace on kind of reduces it a little bit ... hopefully that that gives me peace of mind that I’m not doing more damage”* (participant Z)

Three participants were given tailored cues to alter their running biomechanics, which helped all:

*“I adapted my technique ... my foot was like that (shapes hand to suggest heel-strike) ... Now I’m more like (shapes hand to show forefoot-strike). I can run longer now”* (participant F)

Outside of physiotherapy, customised foot orthoses were provided to three participants by a podiatrist and were effective for two (of three) for running-related symptoms:

*“The pain has decreased ... It definitely decreased just because I find it more kind of comfortable when I do the heel-strike”* (participant L)

Soft tissue massage had varied results. Massage was provided by a physiotherapist but was not beneficial for one participant, but another participant used a self-applied massage tool, which helped short-term:

*“It feels nice to have your IT bands, adductors, and quads released, but in terms of patellofemoral pain, no difference whatsoever”* (participant D)

*“Gua Sha has helped me a lot ... I’ll use it for right below and on the inside of the kneecap and then around my quad and IT band. Basically, anything that feels off or weird or painful”* (participant K)

### 3.4.2. Exercise prescription and outcomes

All participants were provided with an exercise programme as part of their physiotherapy, reporting varied outcomes. Lower resistance exercises were more helpful for pain and self-efficacy:

*“We just did some really mild stuff to try and get my quads to fire a bit more ... I feel quite better”* (participant D)

*“If I was to go for a run, I would do a mini version of the (exercises) ... I could do that with the confidence that I wouldn’t get the pain after”* (participant N)

In contrast, higher resistance exercises were more likely to induce pain. The instruction to use additional weight exacerbated pain for one participant, who subsequently recommended using lighter loads and gradually progressing:

*“I did the whole leg extension thing. I noticed absolutely no difference, none ... and then immediately when adding weight, it was sore right away ... If I knew other ways to strengthen my quads in increments, to be able to do the harder exercises, I think that would help”* (participant Z)

However, pain was accepted if the outcome was perceived as beneficial, in the form of strength gains and pleasure from the exercise:

*“Before when I’ve done it, it’s just been without weight ... Even though they were more painful I think you feel benefit more of doing a weighted exercise”* (participant A)

Progressions and regressions of exercise according to the response, with very gradual increases in resistance, enabled all three participants following this plan to return to running:

*“He was able to adjust the programme and then we took it down for one week to give me a break, and then built it up again slowly”* (participant B)

*“He said to me, use a backpack for your exercises and put one or two bottles ... then three bottles and so yeah, that helped also”* (participant J)

Engagement with exercise was a factor in determining outcomes. Exercises performed regularly were more beneficial for the pain:

*“It feels better, but then if you do keep on top of the ... that’s probably my advice, keep on top of it”* (participant A)

### 3.4.3. Differing individual needs

Half the participants stated explicitly that they felt the treatment of their knee pain was formulaic, instead wanting it to be adapted to their individual needs because of the variation in responses:

*“In a physiotherapy group, others had knee pain and some shoulder pain. I was given exercises, isometric exercises, nothing special, leg raises and clam shells and things like that. But everything for everyone was the same. It wasn’t specified for each case ... Physical therapy should be individual and specialised for that person”* (participant T)

The suggestion was not to use the same approach for each person, but to consider individual needs and that not everyone responds positively to the same interventions:

*“So it’s kind of individualising patient care ... everyone copes and reacts differently”* (participant L)

*“I think I’m aware that all these things are completely different person to person very specific to the individual”* (participant N)

A collaborative approach with clinicians was recommended by

participants, to determine what treatments would be more effective:

*“you have a physio that you can talk to and actually say, I think this is not working and work with them to kind of find a better way that’s always good, and it kind of reassures you and motivates you to do it”* (participant L)

*“Understand what treatment I’ve had, what’s worked, what hasn’t. So that’s kind of how I feel”* (participant D)

### 3.4.4. Building a therapeutic alliance

All participants discussed the psychological and social impact PFP had on their lives, but this was reportedly not addressed. Participants described valuing clinicians taking time to understand their psychological and social needs, contributing to developing strong therapeutic alliance:

*“I think that’s really, a really good experience that someone is interested in whether it’s affects you mentally as well. I think that’s important. It should be part of any treatment”* (participant J)

*“It’s not just treating the knee pain, it’s treating the social issues, the depression”* (participant K)

However, half the participants reported feeling that clinicians were apathetic to their concerns:

*“It was just my doctor at the time that like, he was passing it off as not a serious problem and that sort of thing. Just the whole demeanour”* (participant TN)

*“A lot of times with all the doctors that I’ve seen, it’s like, okay, here’s your knee, this is your life, goodbye. And it’s like, wait a minute ... this is my life”* (participant K)

In contrast, others had a positive experience if they formed a therapeutic alliance with their clinician, which was enabling:

*“It felt more like you know, like more friendly, and then you build that relationship and it’s easier to ask questions”* (participant B)

*“So, I think it’s just, you know, building that rapport with a patient, understanding what’s important to them ... If you understand what I need to do then we can work together to find ways of kind of work around my situation”* (participant L)

Participants recommended that clinicians focus on being more personable and listen and understand what they were reporting, which may then lead to improved outcomes:

*“I think the sort of human side of it in when explaining things just helping me feel like it’s not just me and lots of people have experienced this, or if they’ve been through something similar themselves, or can tell me a story to help me relate which, you know, my physio did. I enjoyed that part of it”* (participant B)

Gaining this understanding strengthened therapeutic alliance and was a more positive experience if the participant and clinician came up with a management plan together:

*“If you understand what I need to do then we can work together to find ways of kind of work around my situation”* (participant L)

## 3.5. Theme three: the role of education

All participants reported being infrequently provided with information or education, despite this being something they desired to inform and empower:

*“Never. I don’t think I’ve had anything”* (participant D)

*"I always say that more information is better ... that's the way I feel ... explaining why glutes are important in controlling your femur, what the role of the quads were, and that kind of just helped me"* (participant D)

It was also felt education could enable self-management and reduce the mental impact of PFP:

*"If I'd have been given more information, I think I'd know how to deal with it more, cope with it, then I wouldn't feel so worthless"* (participant A)

Most participants had a belief exercise would help, but their queries were sometimes unattended to, leaving them inadequately educated:

*"I believe that exercise is the key. The question is only which, and how to progress and all that"* (participant T)

This caused concerns of possibly doing more harm than good:

*"About the exercise, I don't understand what may harm it if I'm doing the exercise wrong or something like that"* (participant Z)

Conversely, when information was given, largely verbal, it was empowering:

*"Because now I had this information. And yeah, then I went to the physio and then we could work on that. So it helped me"* (participant J)

*"He took the time to kind of sit down and really talk to me and explain what was going on with my knee and what my options were, and he did a very good job"* (participant K)

A lack of information consequently led participants to self-searching online, but this approach was deemed unreliable:

*"There's so much stuff out there, that you don't really know what to trust"* (participant L)

Instead, participants turned to research for guidance, believed to be more dependable:

*"Because they're talking about research ... you kind of have something concrete to hold on to"* (participant D)

Despite this, it was rarely discussed in consultations, but was positively received if a clinician did:

*"He explains it and has always got some sort of research up his sleeve. It's like, oh, it shows that it, like, it works"* (participant A)

## 4. Discussion

This study aimed to inform care and intervention delivery for PwPFP by exploring experiences of diagnosis and treatment. An overarching narrative of participants' desire for patient-centred care that meets their individual needs was identified. Three key themes were devised: the value of diagnosis, the need for tailored care; and the role of education.

### 4.1. Theme one: the value of diagnosis

All participants sought a diagnosis but reported one being infrequently provided or discussed. This concurs with previous PFP (Robertson et al., 2017; Smith et al., 2018a), low back pain (Bunzli et al., 2013), and shoulder pain (Jones et al., 2013) research, where the absence of a diagnosis created uncertainty, frustration, and a perceived barrier for participants. A diagnosis was perceived to facilitate a "fix" for their PFP, and participants believed their management would follow the linear diagnosis-treatment-cure model (Toye and Barker, 2010). Consistent with previous research, participants reported that a diagnosis legitimised their pain (Sharma et al., 2020), with diagnostic imaging assisting in providing reassurance and prognosis (Toye and Barker,

2010). Conversely, the absence of an identifiable structural cause left participants feeling disbelieved by clinicians (Bunzli et al., 2017). An inability to understand what pain is (identity beliefs) and what causes pain (cause beliefs), reduces the sense making process and affects cognitive representation. This threatens coping strategies and leads to adverse emotional responses (Bunzli et al., 2017). Although infrequently discussed, a diagnosis was perceived by participants as being key to facilitating their recovery.

The frequent absence of a diagnosis left participants with unattended biomedical concerns over the cause of their pain, postulated to be constructed through previous healthcare experiences and pathology-based explanations of pain and treatment (O'Sullivan, 2012; Parsons et al., 2006). Anxiety, depression, and fear of movement are reported to be elevated in PwPFP and can correlate with pain and reduced physical function (Doménech et al., 2014; Maclachlan et al., 2017). Consistent with previous research, participants in this study reported a dialectic tension between wanting a biomedical diagnosis and recognising that psychosocial factors contribute to pain (Toye and Barker, 2010). Clinicians should look to deliver a diagnosis to PwPFP to avoid leaving them with unattended biomedical concerns.

The psychological and social impact of living with PFP was evident amongst participants, but they reported little support in this regard despite seeking it. The management described by participants in this study was predominantly biomedical, even with recent evidence advocating a BPS approach for PFP (Barton et al., 2018; Crossley et al., 2019; Lack et al., 2018). This may be because physiotherapists hold biomedical preferences and lack confidence in addressing psychological aspects (Synnott et al., 2015). There is a paucity of research on the practical application of the BPS model in PFP (Barton et al., 2018), representing important education and research priorities (Daluiso-King and Hebron, 2020; Søndena et al., 2020).

### 4.2. Theme two: the need for tailored care

The second theme was the described need for tailoring treatment to improve patient outcomes. Exercise therapy, the primary intervention advocated by the most recent PFP consensus statement (Collins et al., 2018; van der Heijden et al., 2015), was the dominant treatment that participants experienced, but with variable prescription and outcomes. Participants that received tailored exercises, with regular support and adjustments from their physiotherapist (Lack et al., 2015; Østerås et al., 2013), did return to activities such as running. However, most participants did not report receiving a tailored exercise programme or an improvement in pain. With no agreement as to which type(s) of exercise (s) are best (Winters et al., 2020), it is recommended that exercise prescription be individualised (Lack et al., 2018). Similarly, foot orthoses, another recommended treatment for PFP (Collins et al., 2018), were effective when tailored to the individual, though only for two of three participants. Tailored treatment programmes should be considered by clinicians in the management of PFP, considering individual patient presentations and the best available evidence (Barton et al., 2015; Lack et al., 2018).

Participants in this study expressed a desire for individualised management, which when combined with strong therapeutic alliance led to a positive experience. A recent systematic review reported that implementing an individualised plan and working through challenges in the patient-clinician relationship, builds a strong therapeutic alliance that may be more effective in addressing musculoskeletal pain (Kinney et al., 2020). Poor therapeutic alliance and failure to improve with treatment often led to 'health shopping' (Bunzli et al., 2013), with participants seeking other opinions or treatments from broader sources, including those without supporting evidence. This typically resulted in poorer outcomes beyond short-term pain relief and led to greater overall dissatisfaction. A strong therapeutic alliance should be nurtured in the management of PFP alongside evidence-informed interventions.

#### 4.3. Theme three: the role of education

This third theme was devised according to participants' desire to understand PFP. Education was viewed by participants as fundamental to enabling self-management and without it they felt lost as to how to help themselves. In contrast, if clinicians took time to explain their management options and provide a treatment plan this was perceived as having value. However, limited education was reportedly provided to participants despite its considered vital role (Barton et al., 2015; Crossley et al., 2019). A recent systematic review reported that education alone may be as effective as combined education and exercise when delivered by a healthcare professional (de Oliveira Silva et al., 2020a). There remains a need to understand how education interventions should be delivered to optimise outcomes, with limited resources currently available for clinical use (Crossley et al., 2019; de Oliveira Silva et al., 2020a).

The lack of education from clinicians meant that some participants constructed their own knowledge through self-searching online. These participants were often concerned that such information may be unreliable and demonstrated a preference for information provided by healthcare professionals. The concerns raised by the participants in this study are valid, with De Oliveira Silva et al. (de Oliveira Silva et al., 2020b) recently reporting that current online information about PFP is inaccurate and should not be used to guide treatment. Clinicians should consider the role of education in the management of PFP to empower patients and facilitate their recovery.

#### 4.4. Clinical implications

The findings of this study complement and extend the existing clinical practice guidelines for PFP (Barton et al., 2015; Crossley et al., 2016a; Willy et al., 2019), which were developed without the patient voice. Clinicians should consider that PwPFP are likely to want a diagnosis, enabling them to make sense of their symptoms and legitimise their pain. Our data also suggest that clinicians explore possible underlying biomedical beliefs that PwPFP have about their knee pain, whilst also exploring the BPS nature of pain. The importance of a strong therapeutic alliance should not be underestimated and may help to improve outcomes alongside evidence-informed interventions. Greater consideration should be given to tailoring treatment and exercise should be adapted according to patient needs and responses. PwPFP should receive education on the nature of their pain, how to tailor or adapt their exercises, and what treatments are most likely to help them. The themes identified in this study are broadly consistent with what is experienced by patients with other common musculoskeletal complaints (Bunzli et al., 2013; Jones et al., 2013; Morrissey et al., 2021) and may well have wider relevance for clinical practice.

#### 4.5. Limitations

Participants were recruited predominantly from social media, with a younger population more likely to volunteer (Frandsen et al., 2016), but the eligible age range was reflective of the demographic who typically experience PFP. Convenience sampling led to a higher than anticipated number of male participants (Smith et al., 2018b) and a greater representation of female participants may have led to different results. Interviews were conducted with Zoom video, which may have impacted the rapport between the interviewer and participants (Seitz, 2016). Online recruitment resulted in a heterogeneous sample of participants from the UK, Europe, and North America, reflective of western healthcare but also different international healthcare systems. We did not identify a wide variation in diagnosis and treatment approaches, strengthening the transferability of our results.

## 5. Conclusion

The overarching narrative derived from three key themes was participants' desire for clearly communicated, personalised care that meets their individual needs. Clinicians treating PwPFP should consider providing a diagnosis or explanation of the pain to avoid uncertainty and confusion regarding the cause of PFP. Individualised, tailored interventions should be prescribed to reduce the potential for variable outcomes. Clinicians should look to nurture a strong therapeutic alliance and provide appropriate and clear education. These data are an important addition to the existing literature and should be considered by clinicians when treating people with PFP.

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## Ethical statement

This study was approved by the Queen Mary Ethics of Research Committee (QMERC/2018/48,036).

## Declaration of competing interest

The authors have no financial disclosures or conflicts of interest to declare.

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## Appendix A. Supplementary data

Supplementary data to this article can be found online at <https://doi.org/10.1016/j.msksp.2021.102473>.

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