Musculoskeletal Science and Practice 43 (2019) 52–57

Contents lists available at ScienceDirect

Musculoskeletal Science and Practice

journal homepage: www.elsevier.com/locate/msksp

Original article

Impact of flare-ups on the lives of individuals with low back pain: A qualitative investigation

Dominique Tan[a], Paul W. Hodges[a], Nathalia Costa[a], Manuela Ferreira[b], Jenny Setchell[a,*]

[a] The University of Queensland, School of Health and Rehabilitation Sciences, Brisbane, Australia
[b] Institute of Bone and Joint Research/The Kolling Institute, Sydney Medical School, The University of Sydney, Sydney, Australia

ARTICLE INFO

Keywords:
Lumbar
Flare
Pain
Patient-centred care
Qualitative

ABSTRACT

Objectives: Investigating flare-ups has become relevant to understanding and managing low back pain (LBP), particularly because there has been a shift in the conceptualization of LBP from acute or chronic to fluctuating or episodic. Available research mainly consists of quantitative studies, which are unable to fully explore the perspectives of individuals with LBP. This study aimed to address this gap by exploring the changes in individual's lives when they experience LBP flare-up.

Design and participants: A qualitative survey of 130 adult participants with LBP was conducted online, and data analyzed via thematic analysis.

Results: The themes from the analysis were: 1) sense of disablement, 2) changes in mood, 3) use of coping strategies, and 4) lack of understanding from other people. Participants described LBP flare-ups as having a negative impact on many areas of their lives, with a few even expressing suicidal ideations.

Conclusions: Results suggest the importance of considering that LBP flare-ups impact individuals' lives in a complex manner including psychosocial and functional effects. Clinicians should consider this complexity in their interactions with, and management of, patients with LBP flare-ups. Additional education may be required to better equip clinicians for these numerous aspects.

1. Introduction

Low back pain (LBP) affects 9–17% of the world's population annually, and is the foremost cause of years lived with disability (Hoy et al., 2014; Vos et al., 2013). The condition impacts multiple aspects of peoples' lives, including hindering participation in activities important to them, and causing harm to relationships (Froud et al., 2014). It is pertinent to garner substantive understanding of the trajectory of this condition and its effect on individuals, in order to appropriately target and assess strategies to reduce recurrence and impact. Often categorized as either acute, subacute or chronic (Spitzer et al., 1987), LBP was previously thought to be a self-limiting condition, with 90% of sufferers recovering within six weeks (van Tulder et al., 2006). However, contemporary studies highlight that LBP more often presents as either persistent and fluctuating, or episodic, and rarely resolves without relapse (Kongsted et al., 2016; Axen and Leboeuf-Yde, 2013). Investigations are thus shifting towards addressing these LBP trajectories, including fluctuations such as episodes, recurrences and 'flare-ups' (Kongsted et al., 2016).

Flare-ups of LBP are common and problematic (Suri et al., 2012). Suri et al. (2011) found flare-ups to be "experienced by nearly all" participants (89%) during a LBP episode lasting three months or less, and also reported a positive correlation between higher flare-up frequency and disability scores (Suri et al., 2011). Although flare-ups of other conditions have been investigated (Cooksey et al., 2010; Moverley et al., 2015; Murphy et al., 2015; Pignolo et al., 2016), flare-ups of LBP are under-researched (Suri et al., 2011; Cooksey et al., 2010; Moverley et al., 2015; Murphy et al., 2015; Pignolo et al., 2016; Setchell et al., 2017a). A standardized definition of a LBP flare-up has recently been established through a multiphase process, describing it as a worsening of the *"condition that lasts from hours to weeks that is difficult to tolerate and generally impacts your usual activities and/or emotions"* (Costa et al., 2019). Flare-ups are therefore not simply characterized by an increase in pain, but also other factors such as fatigue, loss of function, and psychosocial changes (Setchell et al., 2017a; Young et al., 2011a).

There has been little investigation regarding how individuals experience LBP flare-ups. One quantitative study found that half of 634 participants with nonspecific LBP reported increased psychosocial

* Corresponding author. School of Health and Rehabilitation Sciences, The University of Queensland, St Lucia, Queensland, 4072, Australia.
E-mail address: j.setchell@uq.edu.au (J. Setchell).
URL: http://www.shrs.uq.edu.au (J. Setchell).

https://doi.org/10.1016/j.msksp.2019.06.003
Received 5 March 2019; Received in revised form 29 May 2019; Accepted 24 June 2019
2468-7812/ © 2019 Elsevier Ltd. All rights reserved.

issues, disability, use of opioid medication, and pain during flare-ups (Suri et al., 2012). In a prospective cohort study, nearly all of the participants with chronic LBP described a flare-up within a year, and indicated that this impaired their work, mobility, and independence (Young et al., 2011b). McGorry, Webster, Snook, and Hsiang (2000), similarly showed during LBP flare-ups, individuals are more likely to use medication, and have social- and work-related disability (McGorry et al., 2000). One qualitative study found that participants had difficulty coping with flare-ups, and that it impacted their ability to work (Coole et al., 2010). These few studies were primarily deductive, limited to evaluation of predetermined parameters that do not provide opportunities for detailed inductive investigation into how LBP flare-ups affect individuals' lives, and may lack insight into complex aspects of pain experiences (Grahek, 2007). This qualitative study sought to address this gap in the literature by aiming to inductively explore the changes in individual's lives when they experience a flare-up of LBP.

2. Materials and methods

2.1. Study design

This study employed an inductive qualitative survey methodology. Participants with LBP responded to an online questionnaire about how flare-ups affect their lives. This paper discusses findings from the thematic analysis of participants' responses.

2.2. Participant selection

Participants were recruited via lists from a number of sources including previous studies, pain-related consumer organizations, local community and health centers, and advertisements placed on social media. Inclusion criteria were: 18 years of age and older, English language competency, and self-identification as having experienced LBP. All participants gave implied consent by progressing to the survey from the website's information page. Participants could complete the survey in any location they chose, and remained anonymous throughout the survey. Recruitment was ceased when 'data saturation' was reached. Data saturation is considered to occur when topics raised by participants are assessed to be sufficiently explored and repeated in the data and few new relevant topics arise (O'Reilly and Parker, 2012; Fusch and Ness, 2015; Braun and Clarke, 2013). We explored this saturation by conducting iterative reviews of the emergent data, finalising recruitment when there was sufficient depth and richness of data across all survey questions. Ethical approval was provided by the institutional Human Research Ethics Committee.

2.3. Data collection and procedure

Data were collected in 2015 using an online survey. Pilot testing was carried out with four participants (2 female, 2 male), and minor alterations were made to the survey as a result. The survey took approximately 30 min to complete and included 59 questions about participants' perceptions and experiences with LBP trajectories, including flare-ups. Data from other sections of this survey are reported elsewhere (Setchell et al., 2017a, 2017b). In this study, we examined the answers to the question, "What changes in your life when your low back pain flares up?". Data from this question were in short textbox format and typically ranged between a few words and three sentences.

2.4. Methodology and theoretical underpinning

Inductive thematic analysis, as described by Braun and Clarke (2006), was used as the analytic method for this study (Braun and Clarke, 2006). This analytic method is underpinned by relativism, the theory that truth and reality are not absolute but exist in relation to social, cultural or historical context. In the context of LBP, this means that it is individuals' understandings of their pain that create the reality of the condition (or at least individuals' understandings cannot be easily separated from the reality of LBP). Individuals' personal pain experiences are therefore important to understanding LBP – or are so entangled in the reality of LBP the two cannot be extracted individually (Braun and Clarke, 2013; Crotty, 1998). Thus, to achieve a greater understanding of LBP flare-ups, this study examined individual's reported experiences with flare-ups of LBP. Inductive thematic analysis seeks to identify, analyze, and report patterns within the way individuals talk about a topic, and then present these patterns as distinct themes (Braun and Clarke, 2006). Data were interpreted at a semantic level, that is, what participants said was taken largely at face value (Braun and Clarke, 2006).

2.5. Data analysis process

Analysis (Braun and Clarke, 2006) was led by the first author (DT), a physiotherapist trained in thematic analysis by JS, an experienced qualitative researcher with a PhD in psychology. DT and JS independently read through the complete dataset. DT made notes about prominent ideas, which were discussed with JS and PH (a senior LBP researcher), who noted other relevant concepts in the data. Responses unrelated to the research question were excluded from consideration (four responses). DT manually coded findings into tables using Microsoft Word, and then organized codes into themes. Themes were named and defined, and excerpts of illustrative data were extracted. JS iteratively reviewed DT's data analysis during this process. PH and NC (experienced qualitative researcher in LBP) reviewed the findings, leading to refinement for the final report. This study fulfills the relevant sections of the Consolidated Criteria for Reporting Qualitative Studies (COREQ: see Appendix 1), which promotes rigor and comprehensive reporting (Tong et al., 2007).

3. Results

The 130 participants varied considerably in age (range 22–72, mean 43). Most were female (74.6%), and reported daily LBP pain (82%). See Table 1 for more details.

Table 1
Participant demographic and clinical characteristics.

Characteristic	Number of participants (n = 130)
Age	
< 30	23
30-39	32
40-49	31
50-59	37
60-65	4
> 65	3
Gender	
Female	96
Male	34
Country	
Australia	128
Canada	1
United States of America	1
Length of time with back pain	
< 1 week	2
< 1 year	5
1–9 years	59
10–19 years	30
20–29 years	19
30–40 years	11
> 40 years	2
Missing data and anomalies	2[a]

[a] One participant entered an ambiguous answer ("many") to this question, and one did not enter a response.

Table 2
Themes and codes.

Themes	Codes
Sense of disablement	Social life affected
	Work and concentration affected
	Daily activities affected
	Dependence on others
Changes in mood	Low spirits
	Lack of drive
	Frustration and irritability
Use of coping strategies	Use of passive coping strategies
	Use of active coping strategies
Lack of understanding from other people	*No codes identified*

3.1. Themes

Four themes and nine codes (sub-themes) relevant to the study aim were derived from the data (see Table 2). The themes were: 'sense of disablement', 'changes in mood', 'use of coping strategies', and 'lack of understanding from other people'. Although these themes and codes are discussed separately below, overlapping aspects are also discussed within the relevant themes. Participants are identified by numbers.

3.1.1. Theme 1: sense of disablement

The most frequent theme identified in the analysis was that flare-ups impaired multiple aspects of participants' lives. These aspects were categorized into four codes: 'social life affected', 'work and concentration affected', 'daily activities affected', and 'dependence on others'.

3.1.1.1. Social life affected. Participants reported that diverse elements of their social interactions and relationships were negatively impacted by flare-ups. Flare-ups hindered participation in social activities: "*I feel like a burden on my family and cannot socialize with friends like I used to.*" P91, and family interactions "*I … cannot participate in many activities with my children and wife.*" P56. Participants described withdrawing from social activities, to rest or avoid showing others their pain:

The only option is to lock myself away from everybody. That is just my way of handling it. Partly because I don't want anyone to see it, and I no longer have to pretend. I can let my face and body do exactly what it is feeling. P37.

Emotions aspects (see also the theme 'mood changes' below) were also reported to take affect social interactions: "*I get cranky with people around me*" P9 and "*Frustration levels rise as pain becomes overbearing. This can impact on my … personal relationships.*" P78. Two participants said flare-ups affected their sex lives, "*I also have no sexual activity, not only due to pain but also the bowel activity, makes it impossible.*" P45.

3.1.1.2. Work and concentration affected. Participants reported issues with work during flare-ups, including saying that they "*cannot*" or were "*unable*" to work, or that they had to take time off work. For example, one participant wrote: "*Some days I can't go to work because I can't sit or stand.*" P74. Other participants said flare-ups prevented them from working effectively, for example:

> "*It is very hard to concentrate on the work … I cannot find the right position on the chair and constantly need to move. I feel like everyone in the office is annoyed at me constantly moving around in my chair … I work less efficient because I am focused on my pain and on finding the right position to sit.*" P57.

Several participants said impaired concentration limited their work ability.

3.1.1.3. Daily activities affected. Many daily activities were reportedly disrupted by flare-ups. As one participant said: "*All coming engagements or activities, responsibilities, promises, will be cancelled. Life now becomes days spent entirely catering to reduce pain levels … Pretty much everything ceases except for activities to keep you alive such as eating.*" P104. Participants also reported difficulties with sleep, movement, household chores, exercise, following through with plans, and activities of daily living such as eating, bathing, and dressing.

Many participants discussed that flare-ups limited their mobility, for example: "*When it's really bad I can't get out of bed. When it's not so bad, I have mobility restrictions*" P89. Some participants reported being unable to drive or participate in physical and non-physical recreational activities: "*There are sports I no longer play and other things like sitting reading that I don't do for very long or lie down instead.*" P116. These impacts on daily activities were linked to emotions encapsulated in Theme 2 'mood changes' (see below), for example one participant wrote: "*Inability to have good quality of life, unable to do the things I need to and want to do. It's painful and depression. I feel hopeless.*" P67. Two participants said they were at higher risk of falling during a flare-up.

3.1.1.4. Dependence on others. Several participants expressed the need to depend on others to help them carry out daily activities during flare-ups, for example one said, "*I lose the ability to care for myself, I need assistance with showering and at times, dressing*" P30. Another participant reported reluctance to request help, "*Self-esteem is low because you have to rely on others and you don't want to trouble people to do simple tasks which are hard for you to do.*" P47. In contrast, another participant said they felt the need to request help during a flare-up:"*loss of independence = having to ask for help from others to do certain chores around my home … I am slowly learning to ask for help, instead of putting things off*" P66.

3.1.2. Theme 2: changes in mood

Participants reported that flare-ups had a significant negative impact on their mood. The three codes identified in this theme were: 'low spirits', 'lack of drive', and 'frustration and irritability'.

3.1.2.1. Low spirits. Feeling down and discouraged was a consistent thread throughout the participants' responses. Participants commonly described feeling "*depressed*" during flare-ups despite attempts to remain positive, for example: "*My mood is often quite negative, though I do try and make a conscious effort to counter this, I find I am more often than otherwise a servant to my pain.*" P56. During flare-ups, some participants expressed worry that their LBP would not get better, or that they would injure their back further, as a participant said: "*I guess the major thing is that I will tend to be a bit nervous that something I do might worsen the situation*" P130. Notably, four participants reported that the emotional impact of flare-ups was very significant; sufficient for them to contemplate suicide. One participant said: "*depression increases and [I] often have thoughts of suicide as a way to escape the pain.*" P35.

3.1.2.2. Lack of drive. Participants reported a lack of energy and motivation when experiencing flare-ups. Participants attributed the lack of drive to a variety of factors including pain, lack of sleep, and the side-effects of medication. As one participant explained: "*Constant pain is draining … Lack of sleep makes me extremely tired and taking anti-inflammatories or painkillers also makes you sleepy.*" P47. Illustrating the interaction between this code and Theme 2's code, 'low spirits' (see above), one participant said: "*Mobility is reduced during a flare up and they can be draining … Pain feeds the depression and vice versa and it wears on me at times*" P49, and another explained that they felt discouraged from failed attempts to remain motivated: "*Become more anti-social despite previous and several attempts to return to a normal 'active' life. Desire to maintain activity (household duties) or exercise regime is reduced dramatically. Attempts to maintain positive attitude is 'bruised'*" P19.

3.1.2.3. Frustration and irritability. Several participants expressed frustration about their flare-ups, most commonly relating this to

being unable to carry out daily tasks: "*I can't do as much, limits my ability to do everyday tasks, causes frustration*" P36. Other participants said they were frustrated because of the pain, or because other people did not understand their situation, which links this code to Theme 4 'lack of understanding from others' (see below). Participants also described being more "*irritable*" and "*less patient*" during a flare-up, as one reported: "I *feel annoyed, less patient with other problems*" P113.

3.1.3. Theme 3: use of coping strategies

Participants reported using a variety of coping strategies to manage flare-ups. This theme has two codes: 'use of passive coping strategies' and 'use of active coping strategies'.

3.1.3.1. Use of passive coping strategies. Passive coping strategies were described much more frequently than active coping strategies. Many participants reported an increased use of, and reliance on, pain medication, several stating that they "*need*" or "*have to*" take additional medication, as one participant described: "*I clock watch as to when I can have the next dose of medication*" P35. Participants also reported side-effects of medication such as impaired cognition and constipation.

Related to the code 'low spirits' from Theme 2 (above), participants reported that their worry about further back injury contributed to fear-avoidant behaviors including passive coping mechanisms such as withdrawing from activity. For example: "*Reluctance to participate in regular exercise or active activities in case I hurt my back more.*" P129. Several participants reported using other passive strategies such as ice packs, heat packs and hot showers, and consulting healthcare professionals.

3.1.3.2. Use of active coping strategies. A small number of participants described using active strategies to cope with flare-ups. Participants said they aimed to continue with normal activities by adjusting them to be more manageable, for example: "*Must modify work/life/training activities … change training activities to exclude those that directly cause back pain; sit at microscope for more shorter periods*" P77. However, one participant reported unsuccessful attempts to continue with normal activities: "*Become more anti-social despite previous and several attempts to return to a normal "active" life. Desire to maintain activity (household duties) or exercise regime is reduced dramatically.*" P19. Other strategies included changing positions more frequently, stretching, and exercises. For example: "*I tend to be more careful about trying to stretch and so on and to make sure that I move more at work.*" P130.

3.1.4. Theme 4: lack of understanding from other people

Although only a few participants reported that people around them did not fully understand their flare-ups, this seemed an important issue to those who did discuss it, as it impacted several areas of their lives, including their social lives, workplace and healthcare. For example, one participant said: "*I feel people just don't know how debilitating back pain can be.*" P5. Another participant stated that their doctor did not acknowledge their flare-up: "*the way people look at you - the doctor looks at you like he doesn't believe you*" P42. Similarly, another participant described the lack of understanding from people at their workplace:

> "*I still work and it frustrates me that work doesn't understand (or won't listen to) my issue. I work 4 days and was recently told that I have to work 5 days which I am unable to do so and work won't work with me to find a solution so I felt like the only option was to resign … Being an invisible pain, it's harder for people to see and understand why you can't do certain things.*" P43.

4. Discussion

The key finding of this study is that when individuals experience a LBP flare-up, their lives are impacted in multiple ways, which we identified to include experiencing a sense of disablement, changes in mood, and a lack of understanding from other people. We discuss below how our findings concur with some previous study findings. Our findings also add considerable depth and nuance to those from previous literature including novel clinical and research implications.

We found that individuals are likely to experience substantially impaired function during LBP flare-ups. Our findings concurred with those of a study by Young, Wasiak, Phillips, and Gross (2011), which reported that flare-ups impacted participants' lifestyles and relationships, and with another study by McGorry et al. (2000) which found that work and social disability were more likely to occur during flare-ups than other parts of the LBP trajectory (Young et al., 2011b; McGorry et al., 2000). Our finding of an impaired ability to work concurred with Coole et al. (2010), who found that flare-ups disrupted individual's consistency of ability to work, and Ricci et al. (2006), who found that amongst workers with LBP, those with flare-ups contributed disproportionately more to productive work time lost due to LBP, than workers without flare-ups (Coole et al., 2010; Ricci et al., 2006). Our study provides additional insight into details of how participants' lives were affected. For example, the novel finding that a 'sense of disablement' is linked to 'changes in mood'. This link demonstrates the complexity of LBP flare-ups, and should be considered in research and patient management. Disablement in multiple spheres of participants' lives may contribute to a poor quality of life (Preedy and Watson, 2010) and is also important to consider in management and research.

Our findings also suggest that low mood or psychological changes are a common part of the flare-up experience. Emotional changes were also reported in previous research about both LBP flare-ups (Young et al., 2011b), and LBP in the absence of flare-ups(3). However, our study adds to an understanding of the severity of these changes: participants' emotions were often strongly negative, occasionally including suicidal ideations – a safety concern. To our knowledge, suicidal thoughts have not previously been reported in direct relation to LBP flare-ups. Our results suggest that negative mood changes, including the possibilities of extreme psychological concerns such as suicidal ideations should be considered during clinical practice and in further research.

Another finding of our study was that passive coping strategies were likely to be used during LBP flare-ups. This finding adds to other studies, which showed that participants with LBP flare-ups prefer strategies opioid medications (Suri et al., 2012; McGorry et al., 2000). Some of the passive coping methods found in our study imply possible maladaptive coping, including fear-avoidance and catastrophizing, which are significant predictors of long-lasting and disabling LBP (Chou and Shekelle, 2010). Active coping strategies were rarely mentioned by participants in our study. The unpredictability of flare-ups could reinforce damaging fear-avoidant behaviors.

4.1. Methodological considerations

When interpreting our findings, it is important to consider methodological factors that could have an impact on results and their application. This study comprised participants mainly from Australia, hence findings may not be entirely transferable to individuals in other countries, as pain perception can differ between cultures (Edwards et al., 2001). Participants were recruited through volunteer sampling, included sampling from previous studies and various other sources. As a result, findings might not be representative of the population with LBP. However, these sampling methods allowed us to obtain a large sample size for a qualitative study with fairly diverse characteristics (Table 1). It is also important to acknowledge that survey studies produce a particular type of data that is non-naturalistic. The nature of this type of data has been considered elsewhere (Garcia et al., 2004; Beckett and Clegg, 2007; Setchell et al., 2015) highlighting that the language used by participants, even in this non-naturalistic survey text-box form can still provide considerable insights into the experiences and perspectives

of the participants. Because the survey was completed in privacy (unencumbered by a listener) participants were likely to be less wary of judgement, and thus more likely to share their experiences openly as they were free from potential counter response or critique (Beckett and Clegg, 2007). It can, however, be difficult to decipher the tone of language from short textbox answers, which could occasionally have led to some misinterpretation. The researchers attempted to mitigate this by analyzing data at the semantic level. Future qualitative research on this topic could engage in more naturalistic and/or interactive methods to consider how the findings from this study manifest differently across different individuals.

4.2. Clinical implications and future research

Findings provide detailed insights into patients' experiences of LBP flare-ups and the impact they have on their lives. These insights can aid clinicians to better direct assessment and intervention (including selecting appropriate goals and outcome measures) to include not only pain reduction but also, physical function, psychological and social aspects. Our results also suggest that some individuals with LBP flare-ups believe that other people do not understand their situation. Individuals with LBP seek to be regarded as credible(3). To better serve people with this condition, it is important that clinicians (and others) address these concerns by displaying a willingness to listen, and to help equip patients to clearly explain their condition to others.

Our findings suggest that LBP flare-ups have significant psychosocial affects. Psychosocial impacts were commonly mentioned including low mood, frustration and irritability and decreased motivation. Psychosocial factors also included suicidal ideation, which, although only mentioned by a small number of participants, is a serious safety issue and important to screen for, and address in management. Although many clinicians acknowledge the importance of managing the psychosocial aspects of LBP, some studies suggest they are addressed inadequately (Sanders et al., 2013; Gulbrandsen et al., 2010), and many clinicians continue to use a more biomechanical approach to LBP management, even when it is not appropriate (Gulbrandsen et al., 2010; Jeffrey and Foster, 2012). This suggests that further training may be required for clinicians to effectively identify and manage the psychosocial features of LBP (Setchell et al., 2017b). There remain many gaps in the understanding of LBP flare-ups. Future research should aim to investigate how the impact of flare-ups differs from LBP as a whole, and examine the ways in which different consequences of flare-ups relate to each other. Investigations in these areas would then help to inform the optimal management for LBP flare-ups.

In conclusion, LBP flare-ups are likely to have a negative impact on many aspects individuals' lives, including their work and social life. Flare-ups may present safety concerns including increased falls risk and suicidal ideation. Clinicians, educators and researchers should take these issues into account in their work relating to individuals with LBP.

Ethical approval

This project was provided ethics approval through the institutional Human Ethics Board.

Conflicts of interest

The authors have no conflict of interest to declare.

Funding sources

Funding provided by National Health and Medical Research Council of Australia (CRE grant: APP1079078, and Fellowships (PH): APP1102905, (JS) APP1157199). MF holds a Sydney Medical Foundation Fellowship/The University of Sydney..

Appendix A. Supplementary data

Supplementary data to this article can be found online at https://doi.org/10.1016/j.msksp.2019.06.003.

Appendix 1

Consolidated criteria for reporting qualitative studies (COREQ): 32-item checklist.

From:

Tong A, Sainsbury P, Craig J. Consolidated criteria for reporting qualitative research (COREQ): a 32-item checklist for interviews and focus groups. *International Journal for Quality in Health Care*. 2007. Volume 19, Number 6: pp. 349–357.

No. Item	Guide questions/description	Reported on Page #
Domain 1: Research team and reflexivity		
Personal Characteristics		
1. Interviewer/facilitator	Which author/s conducted the interview or focus group?	N/A
2. Credentials	What were the researcher's credentials? E.g. PhD, MD	7
3. Occupation	What was their occupation at the time of the study?	7
4. Gender	Was the researcher male or female?	7
5. Experience and training	What experience or training did the researcher have?	7
Relationship with participants		
6. Relationship established	Was a relationship established prior to study commencement?	N/A
7. Participant knowledge of the interviewer	What did the participants know about the researcher? e.g. personal goals, reasons for doing the research	N/A
8. Interviewer characteristics	What characteristics were reported about the inter viewer/facilitator? e.g. Bias, assumptions, reasons and interests in the research topic	N/A
Domain 2: study design		
Theoretical framework		
9. Methodological orientation and Theory	What methodological orientation was stated to underpin the study? e.g. grounded theory, discourse analysis, ethnography, phenomenology, content analysis	6–7
Participant selection		
10. Sampling	How were participants selected? e.g. purposive, convenience, consecutive, snowball	5
11. Method of approach	How were participants approached? e.g. face-to-face, telephone, mail, email	5
12. Sample size	How many participants were in the study?	7
13. Non-participation	How many people refused to participate or dropped out? Reasons?	N/A

Setting		
14. Setting of data collection	Where was the data collected? e.g. home, clinic, workplace	5
15. Presence of non-participants	Was anyone else present besides the participants and researchers?	N/A
16. Description of sample	What are the important characteristics of the sample? e.g. demographic data, date	7–8
Data collection		
17. Interview guide	Were questions, prompts, guides provided by the authors? Was it pilot tested?	N/A
18. Repeat interviews	Were repeat inter views carried out? If yes, how many?	N/A
19. Audio/visual recording	Did the research use audio or visual recording to collect the data?	N/A
20. Field notes	Were field notes made during and/or after the interview or focus group?	N/A
21. Duration	What was the duration of the inter views or focus group?	N/A
22. Data saturation	Was data saturation discussed?	5–6
23. Transcripts returned	Were transcripts returned to participants for comment and/or correction?	N/A
Domain 3: analysis and findings		
Data analysis		
24. Number of data coders	How many data coders coded the data?	7
25. Description of the coding tree	Did authors provide a description of the coding tree?	9
26. Derivation of themes	Were themes identified in advance or derived from the data?	7
27. Software	What software, if applicable, was used to manage the data?	7
28. Participant checking	Did participants provide feedback on the findings?	N/A
Reporting		
29. Quotations presented	Were participant quotations presented to illustrate the themes/findings? Was each quotation identified? e.g. participant number	10–15
30. Data and findings consistent	Was there consistency between the data presented and the findings?	10–15
31. Clarity of major themes	Were major themes clearly presented in the findings?	9–15
32. Clarity of minor themes	Is there a description of diverse cases or discussion of minor themes?	10–15

References

Axen, I., Leboeuf-Yde, C., 2013. Trajectories of low back pain. Best Pract. Res. Clin. Rheumatol. 27, 601–612.

Beckett, C., Clegg, S., 2007. Qualitative data from a postal questionnaire: questioning the presumption of the value of presence. Int. J. Soc. Res. Methodol. 10, 307–317.

Braun, V., Clarke, V., 2006. Using thematic analysis in psychology. Qual. Res. Psychol. 3, 77–101.

Braun, V., Clarke, V., 2013. Successful Qualitative Research. Sage, London, UK.

Chou, R., Shekelle, P., 2010. Will this patient develop persistent disabling low back pain? J. Am. Med. Assoc. 303, 1295–1302.

Cooksey, R., Brophy, S., Gravenor, M.B., Brooks, C.J., Burrows, C.L., Siebert, S., 2010. Frequency and characteristics of disease flares in ankylosing spondylitis. Rheumatology 49, 929–932.

Coole, C., Drummond, A., Watson, P., Radford, K., 2010. What concerns workers with low back pain? Findings of a qualitative study of patients referred for rehabilitation. J. Occup. Rehabil. 20, 472–480.

Costa, N., Ferreira, M.L., Setchell, J., Makovey, J., Dekroo, T., Downie, A., et al., 2019. A definition of "flare" in low back pain: a multiphase process involving perspectives of individuals with low back pain and expert consensus. J. Pain (in press).

Crotty, M., 1998. The Foundations of Social Research: Meaning and Perspective in the Research Process. Sage, London, England.

Edwards, C.L., Fillingim, R.B., Keefe, F., 2001. Race, ethnicity and pain. Pain 94, 133–137.

Froud, R., Patterson, S., Eldridge, S., Seale, C., Pincus, T., Rajendran, D., ... Underwood, M., 2014. A systematic review and meta-synthesis of the impact of low back pain on people's lives. BMC Muscoskelet. Disord. 15, 50.

Fusch, P.I., Ness, L.R., 2015. Are we there yet? Data saturation in qualitative research. Qual. Rep. 20, 1408–1416.

Garcia, J., Evans, J., Reshaw, M., 2004. Is there anything else you would like to tell us" – methodological issues in the use of free-text comments from postal surveys. Qual. Quantity 38.

Grahek, N., 2007. Feeling Pain and Being in Pain, second ed. United States.

Gulbrandsen, P., Madsen, H.B., Benth, J.S., Lærum, E., 2010. Health care providers communicate less well with patients with chronic low back pain – a study of encounters at a back pain clinic in Denmark. Pain 150, 458–461.

Hoy, D., March, L., Brooks, P., 2014. The global burden of low back pain: estimates from the Global Burden of Disease 2010 study. Ann. Rheum. Dis. 73, 968–974.

Jeffrey, J.E., Foster, N.E., 2012. A qualitative investigation of physical therapists' experiences and feelings of managing patients with nonspecific low back pain. Phys. Ther. 92, 266–278.

Kongsted, A., Kent, P., Axen, I., Downie, A., Dunn, K.M., 2016. What have we learned from ten years of trajectory research in low back pain? BMC Muscoskelet. Disord. 17, 220.

McGorry, R.W., Webster, B.S., Snook, S.H., Hsiang, S.M., 2000. The relation between pain intensity, disability, and the episodic nature of chronic and recurrent low back pain. Spine 25, 834–841.

Moverley, A.R., Vinall-Collier, K.A., Helliwell, P.S., 2015. It's not just the joints, it's the whole thing: qualitative analysis of patients' experience of flare in psoriatic arthritis. Rheumatology 54, 1448–1453.

Murphy, S.L., Lyden, A., Kratz, A.L., Fritz, H., Williams, D.A., Clauw, D.J., et al., 2015. Characterizing pain flares from the perspective of individuals with symptomatic knee osteoarthritis. Arthritis Care Res. 67, 1103–1111.

O'Reilly, M., Parker, N., 2012. 'Unsatisfactory Saturation': a critical exploration of the notion of saturated sample sizes in qualitative research. Qual. Res. 13, 190–197.

Pignolo, R.J., Bedford-Gay, C., Liljesthrom, M., Durbin-Johnson, B.P., Shore, E.M., Rocke, D.M., Kaplan, F.S., 2016. The natural history of flare-ups in Fibrodysplasia Ossificans Progressiva (FOP): a comprehensive global assessment. J. Bone Miner. Res. 31, 650–656.

Preedy, V.R., Watson, R.R., 2010. Handbook of Disease Burdens and Quality of Life Measures. Springer, New York, United States.

Ricci, J.A., Stewart, W.F., Chee, E., Leotta, C., Foley, K., Hochberg, M.C., 2006. Back pain exacerbations and lost productive time costs in United States workers. Spine 31 (26), 3053–3060.

Sanders, T., Foster, N.E., Bishop, A., Ong, B.N., 2013. Biopsychosocial care and the physiotherapy encounter: physiotherapists' accounts of back pain consultations. BMC Muscoskelet. Disord. 14, 65.

Setchell, J., Leach, L.E., Watson, B.M., Hewett, D.G., 2015. Impact of identity on support for new roles in health care: a language inquiry of doctors' commentary. J. Lang. Soc. Psychol. 34, 672–686.

Setchell, J., Costa, N., Ferreira, M., Makovey, J., Nielsen, M., Hodges, P., 2017a. What constitutes back pain flare? A cross sectional survey of individuals with low back pain. Scand. J. Pain 294–301.

Setchell, J., Costa, N., Ferreira, M., Makovey, J., Nielsen, M., Hodges, P., 2017b. Individuals' explanations for their persistent or recurrent low back pain: a cross-sectional survey. BMC Muscoskelet. Disord. 18, 466.

Spitzer, W.O., LeBlanc, F.E., Dupuis, M., 1987. Scientific approach to the assessment and management of activity-related spinal disorders. Spine 12, S1–S59.

Suri, P., Rainville, J., Fitzmaurice, G.M., Katz, J.N., Jamison, R.N., Martha, J., et al., 2011. Acute low back pain is marked by variability: an internet-based pilot study. BMC Muscoskelet. Disord. 12, 220.

Suri, P., Saunders, K.W., Von Korff, M., 2012. Prevalence and characteristics of flare-ups of chronic nonspecific back pain in primary care a telephone survey. Clin. J. Pain 28, 573–580.

Tong, A., Sainsbury, P., Craig, J., 2007. Consolidated criteria for reporting qualitative research (COREQ): a 32-item checklist for interviews and focus groups. Int. J. Qual. Health Care 19, 349–357.

van Tulder, M., Becker, A., Bekkering, T., Breen, A., Gil del Real, M.T., Hutchinson, A., ... Malmivaara, A., 2006. European guidelines for the management of acute nonspecific low back pain in primary care. Eur. J. Pain 15, S169–S191.

Vos, T., Flaxman, A.D., Naghavi, M., Lozano, R., Michaud, C., Ezzati, M., et al., 2013. Years lived with disability (YLDs) for 1160 sequelae of 289 diseases and injuries 1990–2010: a systematic analysis for the Global Burden of Disease Study 2010. The Lancet 380, 2163–2196.

Young, R.A., Benold, T., Whitham, J., Burge, S., 2011a. Factors influencing work interference in patients with chronic low back pain: a Residency Research Network of Texas (RRNeT) study. J. Am. Board Fam. Med.: JABFM 24, 503–510.

Young, A.E., Wasiak, R., Phillips, L., Gross, D.P., 2011b. Workers' perspectives on low back pain recurrence: "it comes and goes and comes and goes, but it's always there. Pain 152, 204–211.