Psychosocial consequences of diagnosing non-specific low back pain radiologically: A qualitative study

ABSTRACT

Background: Chronic low back pain (CLBP) is a complex biopsychosocial problem with financial implications for society. Most LBP is categorized as non-specific CLBP (NS-CLBP); magnetic resonance imaging (MRI) is increasingly used in the investigation of LBP, but has a high false-positive rate for NS-CLBP. **Purpose:** To explore the psychosocial factors associated with diagnosing NS-CLBP by MRI in Saudi Arabia. **Materials and methods:** Using a qualitative design, 11 patients with CLBP without a clear medical diagnosis who had received an MRI scan were interviewed using a semi-structured technique, and transcripts were analyzed using framework analysis. **Results:** Four themes of relevance to the psychosocial consequences of using MRI to diagnose CLBP were identified: (a) impact on social participation after MRI diagnosis, (b) psychological impact of MRI diagnosis, (c) conflicting advice, and (d) patient education. Although some patients expressed a sense of relief following the identification of an objective explanation of their symptoms by MRI, a number of negative consequences were also identified. In particular, fear-avoidance behaviour and anxiety were apparent. **Conclusion:** The use of MRI scanning in the diagnosis of LBP may lead to psychosocial factors influencing participation in physical and social daily activities.

INTRODUCTION

Chronic low back pain (CLBP) is a complex biopsychosocial problem with financial implications for society, particularly due to the associated use of healthcare resources (Depont et al, 2010; Gore et al, 2012; Stewart et al, 2015). Nevertheless, the cause of low back pain (LBP) is rarely established, and the majority of LBP is categorized as non-specific CLBP (NS-CLBP) (Hartvigsen et al, 2018). Despite increasing evidence and growing clinical awareness to inform its management, related care costs continue to grow (Deyo, Mirza, Turner, and Martin, 2009).

Magnetic resonance imaging (MRI) is commonly used for diagnosing structural abnormality in the investigation of CLBP (Rao et al, 2018). MRI, however, has a high false-positive rate for NS-CLBP (Berg et al, 2013; Boden et al, 1990; Jarvik and Deyo, 2002, Jarvik et al, 2005, Chou et al, 2009). The chances of recovering from LBP without diagnosis are high; therefore, labeling patients with an indefinite diagnosis may influence their behavior (Flynn, Smith, and Chou, 2011). The use of MRI in CLBP is discouraged in international clinical guidelines (Koes et al, 2010), and is associated with increased use of pain medication and frequency of physician visits (Kendrick et al, 2001; Modic et al, 2005).

CLBP is recognized globally as the condition associated with the highest number of years lost to disability (Almalki, Fitzgerald, and Clark, 2011; Al Mazroa, 2013). In Saudi Arabia, however, little attention has been paid to treating, preventing, and raising societal awareness of LBP, especially in primary care settings. The Ministry of Health total budget has increased dramatically over the past 10 years, and the number of primary care centers has increased by 17.5% in the last 7 years (Ministry of Health, 2016). Despite this, primary care centers are not providing rehabilitation services (Al-Ahmadi and Roland, 2005). Current international guidelines emphasize that LBP should be managed at the primary care level, since few cases are considered medical emergencies (Foster et al, 2018). Hence, clear pathways of care for CLBP patients in Saudi Arabia need to be established.

Multiple psychosocial factors predict recovery from back pain. Presence of fear, depression, catastrophizing, and anxiety are all reported to predict recovery following a single back pain episode (Beneciuk et al, 2013; George and Beneciuk, 2015; Linton, Vlaeyen, and Ostelo, 2000). Moreover, in a prospective study of 100 CLBP patients with 5 years of follow up, Carragee, Alamin, Miller, and Carragee (2005) reported that baseline psychosocial factors could their predict pain, disability and future medical needs more accurately than structural abnormality presented in MRI scanning.

The psychosocial consequences of MRI diagnostics have not previously been studied; therefore, this qualitative study was performed to explore the potential consequences associated with MRI diagnosis in NS-CLBP patients in Saudi Arabia.

MATERIALS AND METHODS

Participants

Patients were eligible for enrolment if they (a) were between18 and 65 years of age, (b) were experiencing CLBP without a clear medical diagnosis (e.g., malignancy, fracture, infection, spinal stenosis, spondylolisthesis, or inflammatory disease), and (c) had had an MRI scan within the past month. LBP was considered chronic if pain had persisted for more than 3 months. Patients were excluded if they had received pain-relieving procedures (e.g., injection or denervation) within the past 3 months or had any evidence of neurological impairment. Women who were pregnant or less than 6 months postpartum were likewise excluded.

Methods

We used one-to-one semi-structured interviews for data collection. Semi-structured interviews provide a degree of flexibility in letting interviewers follow and explore content elicited in the interview situation. This makes the technique excellent for shedding light on previously unlit topics and phenomena (Edwards and Holland, 2013). Two theoretical models informed our semi-structured schedule: the Fear-Avoidance Belief Model (FA Model) (Vlaeyen and Linton, 2000) and the Work-Disability Prevention Model (Loisel, 2001) (Appendix 1). We focused the interviews on the experiences of participants subsequent to diagnosis by MRI.

The sampling frame comprised individuals satisfying the inclusion criteria who visited the physiotherapy department at a tertiary hospital in the city of Riyadh between January and March 2017. This tertiary hospital receives medical referrals from primary and secondary healthcare centers around Saudi Arabia; Riyadh is the capital city and is the city with the largest population in the country. Therefore, the sample was realistically representative.

Patients were recruited purposively through the lead of the physiotherapy team. Each candidate was given a patient information sheet, which gave the study purpose and details. Once candidates agreed to participate and signed the consent form, they were introduced to the interviewer by the lead of physiotherapy team. The interviews took place in the physiotherapy department and were conducted by a male research physiotherapist (author AA). Interviews took 25 to 45 minutes. The number of participants included in the study was limited to the point of data saturation, at which no new data could be identified, and recruitment was then closed (Saunders et al, 2018).

The interviewer was not known to the participants and was introduced to them as a postgraduate researcher. The interviewer had received training in qualitative research methods as part of his postgraduate training. Although he had no previous experience in qualitative research, he was supervised by two qualitative research experts. The idea for the research came after observation of patterns of radiological diagnosis by the researcher during the last 10 years of his clinical practice.

Ethical approval for the study was obtained from King Fahad Medical City in November 2016 (IRB: H-01-R-R-012). All interviews were digitally recorded and transcribed verbatim by the researcher.

Transparency and rigor of the collected data were further enhanced by adapting a framework analysis method (Ritchie et al, 2014). After becoming familiar with the data by checking transcripts against the recorded interviews, emerging and existing themes were identified. The transcripts were subsequently indexed or coded, and the codes sorted under the identified themes. Finally, codes and themes were examined independently by all the authors, further enhancing the validity of the data (Torrance, 2012). Respondent validation was not possible due to the limited time frame and poor postal service. NVivo (version 10) software was used to arrange and code transcripts and examine the data and their interactions (Bazeley and Jackson, 2013).

RESULTS

Of 18 patients invited to participate, 11 patients (61.1%) agreed to take part. Participants were six men and five women, whose ages ranged from 27 to 61 years, with an average age of 37.6 years (standard deviation = 12 years). All of them had experienced CLBP. Heterogeneity was observed in the duration of the CLBP experienced by the participants, ranging from 6 to 25 years (Table 1 and 2). Three patient participants were housewives, while the rest were in full-time employment.

Four main themes of relevance to the psychosocial consequences of using MRI to diagnose CLBP were developed from the synthesis of our interviews: (a) impact on social participation after MRI diagnosis, (b) psychological impact of MRI diagnosis, (c) conflicting advice, and (d) patient education.

Some patients expressed a sense of relief following the identification of an objective explanation of their symptoms by MRI:

> "I feel relieved after knowing what the problem and the source of pain is." (PT 1)

However, there were also multiple negative consequences that will be discussed below.

Theme 1: Impact on social participation

Many patient participants in this study explained how their back pain, after MRI diagnosis, had a negative impact on their social and family life, through withdrawal from valued activities and a lack of social participation, as one patient explained:

> "My kids always want to go to public places. I refuse to go with them because of my back pain. When my sister invites me, I apologize due to my back pain."
> (PT 9)

One 30-year-old male voiced that due to the fear of exacerbating symptoms, he was seriously thinking of changing his job as a teacher:

> "I have a problem: frankly I worry about any movement and I am considering changing my profession as a teacher to a less active job." (PT 11)

Theme 2: Psychological impact

Patients reported that the use of MRI scans caused some degree of anxiety, as it prompted reading more about their diagnosis.

> "After knowing my diagnosis, I started to be anxious, I read a lot about my symptoms and exercises. Now I have anticipated pain before any movement.
> I can't sit comfortably." (PT 10)

Additionally, some patients appeared to have been surprised with the diagnostic term "disc prolapse":

> "I was not expecting my diagnosis to be a disc prolapse! I thought I pulled a muscle or something, but not in my spine!" (PT 9)

Theme 3: Conflicting advice

Some patients described how they received conflicting messages and diagnoses from doctors. One patient explained his experience of having three different diagnoses and three different treatment plans:

> "A private hospital told me, 'You have a slipped disc; your disc is out of place. If it continues like this, we'll have to perform surgery.' Another hospital said, 'You have nothing wrong and everything is normal.' The third hospital told me, 'It is a disc prolapse that's caused some deformity in your spine.' I did not understand my diagnoses." (PT 7)

In the example above, the conflicting information might have been the result of dissatisfaction with the original diagnosis. This conflicting information appeared to lead to a heightened level of confusion and pain, as one patient highlighted:

> "From the beginning, the diagnosis should be clear. If you receive different diagnoses from every doctor, you lose motivation to improve and rely more on pain medications." (PT 8)

Theme 4: Patient education

Although patient education is emphasized in most international CLBP management guidelines, the content of education provided differs among healthcare practitioners. One patient below described receiving some form of reassurance; however, it was accompanied with a worrying statement that "you might need surgery":

> "Last time I saw my doctor, he showed me the result [MRI scan] and told me there was nothing to worry about. He told me to try exercise now and that I might need surgery later." (PT 7)

Conversely, another patient, a 34-year-old female, reported being provided with epidemiological data together with psychological advice:

> "They told me 90% of the Saudis have similar diagnoses and mostly they have no pain. They instructed me to stop thinking about it and try to engage in a sport that you like." (PT 2)

DISCUSSION

This study explored the lived experience of CLBP patients after MRI diagnosis in the Saudi Arabian healthcare system. The first theme, impact on social participation, revealed an effect on patients' activities of daily living and participation. In line with previous research (Corbett, Foster, and Ong, 2007; Strunin and Boden, 2004), our results revealed that patients experience difficulties related to family and social obligations, in particular interaction with their children and public socializing. Furthermore, patients reported that pain impacted their work, including their productivity; this has also been previously demonstrated (McDonald, Dibonaventura, and Ullman, 2011; Stewart et al, 2003). In summary, pain may be considered a significant socioeconomic burden for the patient as well as society (Linton, Vlaeyen, and Ostelo, 2002; Loisel et al, 2002).

The second theme, which identified the psychological impact of the use of MRI in diagnosing NS-CLBP, revealed a number of psychological factors associated with receiving an MRI-based diagnosis. Many patients reported fear or anxiety about their diagnosis as well as their prognosis and how these may lead to various restrictions in physical activity such as avoidance behaviors, consistent with the notions of the FA Model (Vlaeyen and Linton, 2000). Avoidance behavior, in turn, may cause or exacerbate chronic musculoskeletal pain.

Previous research suggests that CLBP patients believe imaging to be necessary for diagnosis (Jenkins et al, 2016). Hence, people who are in pain tend to seek out explanations for their suffering, and they tend to adhere to any explanation provided (Bunzli, Smith, Schutze, and O'Sullivan, 2015; Serbic and Pincus, 2014). In relation to this, patients may become attached to their medical diagnosis. When the basis of diagnosis and patient education is a biomedical disease model, this may have far-reaching consequences. First, it may complicate rehabilitation and pain management, and hence recovery, by removing focus from non-biological factors that influence the experience of pain. Second, it may lead patients to try to link any improvement with changes to their MRI, thus prompting MRI overuse, which in turn may increase the economic burden of CLBP.

The third theme was conflicting advice, and Darlow et al. (2014) have shown that the beliefs of healthcare practitioners about LBP management may be associated with conflict in the information given to patients. Attempts to explain pain as being caused by tissue damage and giving a diagnostic label for NS-CLBP may contribute to patient uncertainty, leading them to seeking further explanation. Therefore, exploring patients' attitude and beliefs in cases of NS-CLBP is highly recommended (Darlow et al ,2014; Lim et al, 2019).

The fourth theme, patient education. Our results support the notion that education is an important part of CLBP management (Moseley, 2002; Moseley, Nicholas, and Hodges, 2004; Traeger et al, 2015); they are, however, also a testament to the diversity of patient education in Saudi Arabia. Although biopsychosocial evidence-based education is effective in reducing fear, anxiety, and disability in CLBP (Brox et al, 2008; Louw, Diener, Butler, and Puentedura, 2011; Moseley, 2002; Moseley et al, 2004), uncertainty about the given advice was noticed in our study. Accompanying reassuring messages with uncertainty may provoke further worry and fear of injury. However, the practice of including epidemiological information with the

MRI report has been linked to a decrease in use of pain medication and doctors' visits for LBP, as reported by Mccullough, Johnson, Martin, and Jarvik (2012) in a retrospective study. Therefore, we suspect relationships exists between type of education, patient acceptance of an MRI diagnosis, their need for further imaging, and the outcome of rehabilitation or management. These relationships warrants future investigation.

The voice of healthcare practitioners needs to be heard with regards to the current utilization of MRI in CLBP; however, the findings of this study indicate that referral for MRI for patients with LBP requires legislative action to avoid over-diagnosing CLBP in patients. The practice of using MRI to diagnose CLBP by healthcare practitioners, when accompanied by insufficient biopsychosocial-oriented education, may be related to the fear and anxiety reported by some patients.

The findings of this study further emphasize the international clinical guidelines for discouraging imaging for LBP patient and not only it is impractical it also might be associated with an elevated sense of fear and anxiety which could hinder patient's recovery. Therefore, healthcare practitioners need to explore the presence of these psychological factors for patients who underwent imaging.

Limitations

Despite being the first study, to our knowledge, to investigate the psychosocial impact of diagnosis of CLBP by MRI, certain limitations must be addressed. The interviewing researcher's background is as a physiotherapist, and a degree of interviewer bias and confirmation bias may have been present. By adopting a semi-structured interview approach with inspiration from contemporary models, we sought to minimize this weakness.

Further subjectivity may have arisen during analysis, because only one author undertook the interviews and transcription. Nevertheless, this process also facilitated familiarity with the data. An additional potential weakness concerns external validity, as we sampled from only one prominent public treatment facility. The facility in question, however, receives patients from all over Saudi Arabia due to its dedicated care.

CONCLUSION

The participants in this study identified a number of psychosocial factors related to their diagnosis of CLBP from MRI scanning. In particular, fear-avoidance behavior and anxiety appeared to lead to lack of participation in physical and social daily activities. The conventional biopsychosocial education provided may have been associated with these consequences.

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Conflict of interest

The author(s) declared no potential conflicts of interest with respect to the research, authorship and/or publication of this article.

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Table 1. Participant characteristics

Participant code	Age (years)	Gender	Level of education	Occupation	Duration of LBP (years)	Avg. pain intensity
PT.1	36	Female	High	Housewife	10	5
PT.2	34	Female	University	Employed full-time	6	3
PT.3	32	Male	University	Employed full-time	6	4
PT.4	57	Female	Primary	Housewife	20	9
PT.5	61	Female	Secondary	Housewife	25	10
PT.6	30	Male	College	Employed full-time	8	5
PT.7	48	Male	High	Employed full-time	14	8
PT.8	28	Female	University	Employed full-time	6	6
PT.9	27	Male	University	Employed full-time	6	5
PT.10	31	Male	University	Employed full-time	10	5
PT.11	30	Male	University	Employed full-time	6	8

LBP, Low back pain.

Table 2. summary of participant characteristics

Gender	Male: 6 Female: 5
Age (years)	*M* = 37, range: 27–61
Duration of low back pain (years)	*M* = 10 years, range: 6–20
Pain severity (last month, scale 1–10)	*M* = 6, range: 5–10

Appendix 1:

Certain people with NS-LBP after receiving the MRI results have changes in different aspect of life. **If you have MRI result from your doctor, what are the psychological and functional changes that you have experienced after the results?**

General prompts for participants with chronic LBP:

1. Can you tell me about your experience of chronic LBP?
2. What was the main problem that led you to seek medical care?
3. What was you understanding of LBP before seeking medical care?
4. What expectations you have about medical care?
5. Have you had any other treatment for your LBP other than that previously mentioned?
6. What have changed in your understanding of your problem after been diagnosed by MRI?
7. What have changed in your function after?
8. What changes have you experienced in your work after been diagnosed with MRI?
9. What changes have you experienced in social life after been diagnosed with MRI?