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Physical therapists should integrate illness perceptions in their assessment in patients with chronic musculoskeletal pain; a qualitative analysis

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ABSTRACT

In the past decade, scientific evidence has shown that the biomedical model falls short in the treatment of patients with musculoskeletal pain. To understand musculoskeletal pain and a patient's health behavior and beliefs, physical therapists should assess the illness perceptions of their patients. In this quantitative study, we audiotaped the assessments of 19 primary care physical therapists on 27 patients and analyzed if and how illness perceptions were assessed. The Common Sense Model was used as the theoretical framework. We conclude that some of the domains of the Common Sense Model were frequently asked for (identity, causes and consequences), while others (timeline, treatment control, coherence, emotional representation) were used less frequently or seldom mentioned. The overall impression was that the assessments of the physical therapists were still bio-medically oriented in these patients with chronic musculoskeletal pain.

1. Introduction

For many physical therapists, a patient's health-behavior has become an important outcome of treatment, especially in patients with chronic musculoskeletal pain (MSK pain) and/or chronic diseases. To understand the patients' behavior, it is of importance to first analyze their current health behavior (Leventhal et al., 2008). Physical therapists therefore need to identify the factors related to this health behavior. In the last decade's research, particular psychological research has been published focusing on the perceptual and cognitive factors underlying a patient's health behavior.

A framework that highlights the importance of illness perceptions by linking illness perceptions to health behavior is the Common Sense Model (CSM) (Leventhal et al., 2003). The CSM identifies the factors involved in the processing of information by a patient regarding their disease or illness, how this information is integrated to provide a view of the illness, and how this view guides health behavior (Hagger and Orbell, 2003). In this identification process of symptoms, several factors can interfere such as general information (i.e. earlier experiences, cultural factors, social contacts), external information from significant others (doctors, parents), and the personal interpretation of current experiences i.e. bodily sensations for instance experienced during physical activities (Hagger and Orbell, 2003).

In the original CSM five core components of illness perceptions have been identified; *identity* – the symptoms associated with the illness, *cause* – personal ideas about etiology, *time-line* – the perceived duration of the illness, *consequences* – expected effects and outcome, and *cure control* - how one controls or recovers from the illness (Weinman et al., 1996). Later extended with the domains *illness coherence* (personal understanding of the illness or symptom) and *emotional representation* (emotional response to an illness or symptom) (Moss Morris et al., 2002). To study the domains of the CSM the Illness Perception Questionnaire (IPQ) was developed (Weinman et al., 1996). Later also a revised (IPQ-R) and brief version (IPQ-B) were developed (Moss Morris et al., 2002; Broadbent et al., 2006). The reliability, validity and feasibility of the revised Illness Perception Questionnaire (IPQ-R) was confirmed in several pain populations, although a factor structure for the IPQ-R in samples of

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patients with MSK pain showed limited evidence that the seven dimensions of the IPQ-R are distinct. Also a clear structure for the causal items was not determined. The authors stated that further work is needed in primary care patients with MSK pain (Nicholls et al., 2013).

Chronic MSK pain is the most frequently treated disorder by primary care physical therapists. The illness perceptions of patients with chronic pain largely determine their prognosis, and have been identified as important in the ability to control MSK pain conditions. In both cross-sectional and prospective studies across different MSK pain conditions, illness perceptions have been shown to be related to the severity of pain, affective distress, muscle and joint tenderness, pain-related disability, and poor treatment outcomes (Edwards et al., 2006; van Wilgen et al., 2008; van Ittersum et al., 2009). Patients with low back pain who attribute more physical symptoms to their low back pain had longer disease duration, and patients with a lower feeling of control of their back pain had a worse clinical outcome after 6 months (Foster et al., 2008). In patients with orofacial pain, it was shown that believing pain could have serious consequences was the most important predictor for treatment outcome. Furthermore, a low personal control and a chronic timeline were predictive for negative outcome (Galli et al., 2010). Changing the illness perceptions of patients after myocardial infarction positively influences the recovery and return to work of patients (Petrie et al., 2002).

Perceptions of patients with chronic MSK pain do not only predict outcome. They are also directly associated with altered movement performance in low back pain (Moseley, 2004), represent a major determinant of adherence to home exercise programs (Medina-Mirapeix et al., 2009), and are critical for the clinical effect of physical therapy interventions such as training of motor control in the lumbopelvic region (Oliveira et al., 2009). When illness perceptions are assessed properly, the physical therapist will have a better understanding of a patient's health behavior, motivation for treatment, and the need for specific education to try to alter these maladaptive perceptions (Nijs et al., 2011).

We conclude that there is increasing evidence that illness perceptions are useful for clinical physical therapists in their goal to focus on health behavioral change and in self- management. However, most illness perception studies have been carried out to demonstrate relationships between illness perceptions and outcomes. In contrast, relatively little work has been reported regarding if physical therapists are specifically questioning these illness perceptions in their assessment of patients with MSK pain.

The purpose of this study therefore was to analyze qualitatively how physical therapists working in primary care integrate illness perceptions during the first assessment of patient with chronic MSK pain, therefore physical therapists were asked to audiotape their assessments.

2. Methods

2.1. Physical therapists and patients

Participatory physical therapists were working in primary care practices in the northern part of The Netherlands. The physical therapists all had a degree in physical therapy with or without additional education. Patients with chronic MSK pain were determined by pain perceived in muscles, joints and bones or general pain such as fibromyalgia and back pain with referred pain. The pain was present for at least 6 weeks and had no specific somatic cause. The diagnosis was set by the participating physical therapists. Exclusion criteria were; patients not speaking the Dutch language, patients with other co-morbidity and patients who were treated for the same musculoskeletal pain at the same physical therapy practice before.

2.2. Design

To investigate the integration of illness perceptions in the assessment of the physical therapist a qualitative exploratory design was used. The participating physiotherapists were asked to audiotape their interview during the first consultation. The illness perceptions during the interview were inventoried afterward.

2.3. Procedure

Primary care physical therapy practices in the northern part of The Netherlands were approached to participate in the study. Physical therapists were informed about the study, although, to avoid information bias, they were told that the communication between the physical therapist and the patient was investigated. Afterward physical therapists where debriefed about the exact purpose of the study. When physical therapists approved to participate in the study, further information was given to them about the patient's inclusion and exclusion criteria and audio recording equipment was delivered. Each participating physical therapist was not required to recruit more than two patients for the study. The patients were informed about the study by their physical therapist and were assured of confidentiality before the start of the interview. The Human Research Ethics Committee of the University Hospital of Brussels approved the study and in case both the physical therapists and the patients agreed to participate, written informed consent was obtained prior to testing.

The interview during the first consultation took place in the private practice of the physiotherapist and was recorded by digital audio recording equipment. The audio recordings as a whole were transcripted verbatim by four researchers. The questions of the physical therapist and the responses of the patients were described separately. The patient's demographic and clinical characteristics were asked using a short questionnaire. The characteristics (age, gender, and additional education) of the physical therapists were collected through e-mail.

2.4. Analysis

The transcripts were read several times by each of the researchers so they could achieve familiarity with the contents. Before the study the observers were instructed and trained by indexing several assessments from patients other than those participating in the present study. Furthermore to increase the inter-rater reliability an observational instrument the GOSSIP (Groningen ObServation Score for Illness Perceptions) with instructions for the observers was used. Table 1 presents this observational instrument. In the analysis a deductive approach with an existing theoretical framework, the Common Sense Model, was used (Pope et al., 2000). Two researchers systematically indexed the interviews separately and blindly from one another. Any differences in the initial indexing process per interview and between researchers were resolved by discussion to reach consensus with use of the GOSSIP. In total, four researchers indexed all the transcripts of the interviews.

Within the assessment transcripts, significant phrases were identified which characterize a specific question to assess an illness perception by a physical therapist or an illness perception mentioned by a patient with chronic MSK pain. The phrases were categorized according to the seven core components of illness representations in Leventhal's Common Sense Model (CSM)

Table 1
Description of the original components of illness representation, classes of data and specific items named during the assessment.

Domains of illness representations	Description of the component	Classes of items named during assessment	Items named during assessment
Identity	Overall perceived symptoms and symptoms related to the diagnosis of MSK pain.	Symptoms directly related to the MSK complaints	Symptoms (pain, tingling, stiffness, pulling, abrasion, fatigue, weight loss, deviated posture etc.)
		Thoughts about health in general	Symptoms related to chronic MSK pain
Cause	Personal beliefs about etiology of the complaints both psychological and somatic causes	Psychological attribution	Poor immune (immunity)
		Risk factors (heredity, smoking, diet, ageing, surrounding factors, my own behavior/life style, poor medical care in the past)	The onset of symptoms due to "stuck", "short of mobility", "blockages", "tense muscles" (physical)
		Immunity (virus, pollution)	The onset of symptoms by surgery or trauma (physical)
		Accident or chance (bad luck, accident or injury)	The onset of symptoms out of other body regions;
		Physical causes (a certain illness, inflammation, osteoarthritis, blockades, obstruction, cramping)	The onset of symptoms related to a specific disease (e.g. Fibromyalgia);
			The result of complaints by environmental factors (e.g. a bad mattress, new job);
			The onset of symptoms associated with mental disorders such as stress, anxiety, work, overuse.
			The onset of symptoms is genetic.
			No obvious cause (accident/change)
			The onset of symptoms by apparent abnormality in the body such as calcification, inflammation, tear, nerve crush. (Physical cause)
Provoking factors	Personal beliefs about provoking factor for the exacerbation of symptoms (pain)	Provoking factors for the symptoms: movement in general, environmental factors, specific movements/a specific posture, certain activities	Specific movement or activities
			Provoking movements or postures or environmental factors, e.g. cramped posture, new job, stress.
			Performing (too much) activities which the complaint have emerged
Timeline	*Beliefs about* how long complaints will last. Beliefs about relieve of symptoms, the possibility of healing, variability in symptoms, and predictability of complaints. Only future timeline must be scored, not duration of symptoms in the past.	The course of the complaints	The course of symptoms over time and per day
		Expected time until recovery.	
		Course of the complaints	Time to reduce symptoms.
Consequences	*Beliefs about the* consequences of the complaint both socially and physically, the extent to which the complaint affects the way others see me, financial consequences.	Consequences related to daily activities, sports, work, movements and function.	Obstacles in ability to perform ADL, housekeeping, maintain normal daily routine
			Effect of the complaint on the environment.
			Limitations in the ability to perform work, sport/exercise and hobbies
Control on recovery	Beliefs about the extent of which the patient thinks he/she can control the complaint. Beliefs about the extent of which the patient can influence the complaints, thoughts on the effectiveness of treatment, the degree to which a treatment can work, the extent to which a certain treatment can control (or cure) the complaint,	Personal control	Personal control (coping):
		Treatment control	Dealing with the complaints/Knowledge of boundaries
			Taking rest, relaxation, distracting thoughts
			Taking pain medication
			What is done to reduce the complaints.
			Strategies to reduce symptoms or exercises to reduce complaints.
			Treatment control:
			Expectations of physical therapy.
			The impact of therapy on the symptoms
			Beliefs of patient about treatment and effects
			Visiting a doctor or other caregiver, undergoing surgery.
Coherence	The extent to which one understands the complaint.	Understanding of the complaint	Not know how to interpret the symptoms
			Not understanding complaints
Emotional representations	Influence of the complaint on one's mood; get depressed, get upset, get angry, get afraid, worrying, get anxious Emotional representations in response to the complaints and symptoms. Not general emotions or emotions in response to a question.	Emotions directly related to the complaint	Expressions of anger, insecurity, fear, sadness, irritability, related to the complaint.
			Manifestations of the emotional impact of the complaint, complaint of influence on mood

(Leventhal et al., 2003); identity, causes, timeline, consequences, control on recovery, illness coherence and emotional representations. In case an illness perceptions could not be related to one of the seven core components of the CSM a new category was suggested. Assessments were included until a good overall impression was reached.

3. Results

In total, 26 physical therapists were invited for study participation. Of these, 4 did not respond to our request (for unknown reasons), and 3 refused to participate (2 therapists were not interested, 1 did not treat patients with chronic MSK pain). In total 19 physical therapists participated and 27 patients were included in the study. The characteristics of the physical therapists and patients are presented in Table 2. All physical therapists had a degree in physical therapy and were working in a primary care physical therapy practice.

After analysing the interviews the domains of Leventhal's CSM could be confirmed although one additional subdomain could be identified, namely provoking factors.

3.1. Identity

In the domain of identity, physical therapists asked for the symptoms perceived by a patient. Identity was asked for in general questions e.g.; "can you tell me your complaints", or "do you have complaints right now?" or through specific questions; "do you have tingling's in your leg?", "do you feel stiffness in the morning?", or "do you suffer from dyspnea?" Physical therapist also reflected on what patients said:

Patient: "I really have to concentrate when I get out of bed."

Physical Therapist: "What is the problem, is it pain or stiffness?"

Physical therapists often related symptoms to physical activities e.g.: "does your knee feel swollen after walking". Some physical therapists elaborated on pain by asking for the type of pain such as "Is your pain burning, itching or annoying?" Also the intensity of pain was frequently asked for; often with a Numeric Rating Scale for pain "can you rate your pain on a scale from zero (no pain) to ten (maximum pain)?"

Table 2
Socio-demographics of the participating physical therapists and patients with MSK pain.

Physical therapists $n = 19$		
Gender	Female	7
	Male	12
Years of age (range)	Mean	39(23–57 years)
Additional education	None	5
	Manual therapy	5
	Psycho-somatic PT	4
	Sport PT	2
	Other	3
Patients ($n = 27$)		
Gender	Female	21
	Male	6
Years of age (range)	Mean 45 (19–86 years)	
MSK pain[a]	Hip	1
	Knee	6
	Neck-shoulder	8
	Low back pain	4
	Pelvic	3
	Fibromyalgia	2
	Wrist	1
	Chest	1
	Lower leg	1

[a] MSK pain encompassing many different types of pain in different body sides is not related to specific tissue damage or inflammatory processes.

Patients mentioned a variety of different symptoms related to their musculoskeletal pain, much more than physical therapists asked for, including; pain, stiffness, swelling, fainting, itches, fatigue, loss of strength, clicking (in the back), tearing, instability, "it feels heavy". If physical therapists asked a general open question ("What is the reason for your visit?"), patients often replied by naming a symptom, mostly "pain".

3.2. Cause

Physical therapists occasionally asked for illness perceptions related to the causal beliefs of patients about their chronic MSK pain, for instance "Do you know what causes your pain?", or "Do you know what happens when you suffer from pain?" or "Did someone [a doctor] tell you what could be the cause of your low back pain"? Physical therapists however most often asked general questions related to the cause of pain, such as "Where did this complain originate from?" or "Can you relate these complaints to diseases running in your family?" Physical therapist frequently asked questions related to the occasional onset of the chronic MSK pain i.e. "Can you describe how this started?" or "When did it start?" Most questions related to the causal beliefs were somatically oriented. Physical therapists seldom asked for specific psychological contributions to the pain or did not elaborate on psychological causes when reported by patients; although some asked for "stress" as causal belief for pain.

Patients reported many illness perceptions related to the time of (pain) onset and to potential causes of pain. Several occasional causes were mentioned: "A doctor gave me wrong medication," "I think the cause is that I smoked too much," "My grandfather and father also had a bad back." Others had specific perceptions about physical causes for pain e.g.: "this [the pain] is caused by arthritis" or "I have too much space between my vertebrae, I am unstable", or they told what former doctors said "he [the doctor] said after he saw the swelling, that's your meniscus."

3.3. Provoking factors

Besides the perceptions about causes of pain, physical therapists asked for factors that could provoke the pain e.g. specific activities or situations or specific movements. Provoking factors were frequently questioned by the therapists, and/or spontaneously mentioned by patients. Physical therapists asked; "During which activities does your pain increase?" or after a patients told about pain "Do you know why this increased your pain?" Provoking factors mentioned by patients varied substantially e.g. "When it is freezing outside I have more back pain" or "the pain increases after overuse" or "after I drove for a long time it was very painful to get out of the car".

3.4. Timeline

This domain refers to the time patients think the disease will last. Physical therapists seldom asked specific questions in this domain. They asked questions about how long the MSK pain existed e.g. "how long do you have this pain", "when was the onset of your pain" and "what happened before the current assessment" but never what the patient thought about how long the MSK pain would remain. Patients, on the other hand, sometimes referred to the timeline of their MSK pain, for instance "after a massage I believe the pain will be gone".

3.5. Consequences

Physical therapists asked questions about physical consequences. These consequences related to general behavior e.g. “What are the consequences of your pain related to your daily activities?” or “Are you able to work or ride a bike?” or specifically ”Do you feel restricted when you have to lift things [during your work]?” Furthermore, physical therapists asked for specific consequences of MSK pain related to bodily functioning like a decreased range of motion, muscle strength or physical condition. Patients also mentioned practical consequences such as “since I have this pain I am not able to participate in sports” or “since I have this pain it is painful turning over in bed” or “I had to adjust my work because of this pain”.

3.6. Control on recovery: personal and treatment control

Physical therapists asked specific questions about how patients were coping with their MSK pain. In case of chronic MSK pain the personal and treatment control is not always specific on recovery but more on control of pain. Physical therapists asked “What did you do to change your pain?” or “Does medication relieve your pain?”, ”When does your pain become worse or better?” To assess personal control physical therapist often asked questions related to physical activities such as avoiding bending in case of low back pain, avoiding heavy lifting, or resting during the day.

Treatment control can be related to the treatment expectations i.e. “Do you have any thought about how I [physical therapist] can help you with your problem?” Physical therapists often asked for former treatments “You have this knee pain for half a year. Did you have other treatments before?” or “what did you do yourself to control your pain?”

3.7. Coherence

This domain was seldom specifically asked by physical therapist i.e. “do you understand the pain you suffer from”. Patients also seldom reflected on “not understanding” the complaints or “the nature” of their pain. Most often they had some kind of understanding of their MSK pain, although these thoughts were often irrelevant.

3.8. Emotional representations

Physical therapists rarely asked specifically for emotional representations. Questions we coded were: “we do know that Fibromyalgia has a great impact on someone’s life. What is the impact on your life for instance for your emotional well-being?” or “Did you have a lot of stress lately?” These questions were rare and physical therapists did not often elaborate on emotional representations when presented by their patients. Emotional expressions such as “I am afraid this pain never goes away” or “when I feel pain, for me this is a signal to lower my activities, this frightens me” were often followed by another question, the reassurance of a patient or by giving information e.g.;

Patient: “My pain changes from day to day, sometimes when I have a very bad day I think if this goes on for the rest of my life-……you know.” [patient cries]

Physical Therapist: “It doesn’t matter, we see this all the time, I will give you some information, we see a lot of patients with fibromyalgia…”.

4. Discussion

The results of this study demonstrate that the CSM of self regulation with the seven domains of illness perceptions, are confirmed when analyzing the assessments of physical therapists. In case of chronic MSK pain, an additional subdomain (i.e. provoking factors) could be added to the cause domain of the CSM. We also conclude that although the bio-psycho-model is underlined by most physical therapists in patient with chronic MSK pain, the illness perceptions related to psycho-social factors need more attention and several domains of the CSM should be asked more specifically.

Asking for specific illness perceptions in patients with chronic MSK pain is of importance to understand health behavior (Hagger and Orbell, 2003). Especially maladaptive perceptions about the cause of pain should be investigated, as this can be an important factor in the maintenance of chronic pain. The variety of maladaptive illness perceptions about causes for pain in this group of patients was notable. From previous research, we know that having maladaptive perceptions about the cause of pain can lead to feelings of harm, vulnerability, more restriction in physical activity and more use of medical care (Goubert et al., 2004). Harm and a somatic focus on pain, especially in low back pain, are important determinants for fear of movement which has been determined to be one of the risk factors for chronic (low back) pain (Vlaeyen and Crombez, 1999). It can also lead to maintaining a search for medical solutions, ignorance of psychological contribution to pain (van Wilgen et al., 2013), or lower self-expectations even after treatment or recovery (Larmer et al., 2011). Maladaptive perceptions found during the assessments should be discussed during treatment, for instance, by providing specific pain education about the causes of pain (Nijs et al., 2011). Additionally, this could also be discussed at the end of treatment to discuss a patient’s concerns or fears prior to discharge (Larmer et al., 2011). Programs should be theory based, individualized and patient centered i.e. specific perceptions should be targeted during treatment (Petrie et al., 2002; Glattacker et al., 2012). These programs improve not only the perception of patients with MSK pain, but also lead to a higher personal control and better long term results compared to traditional care (Glattacker et al., 2012).

In the last decade physical therapists have become aware that psycho-social and behavioral factors interfere with the pain of their patients. The bio-medical view is currently seen as insufficient and a bio-psycho-social model has been recommended in case of treatment of patients with MSK pain. Nevertheless, most physical therapists were, or are still, educated in a dominantly biomedical view on pain. This biomedical view may exacerbate maladaptive beliefs and consequently result in inadequate treatment recommendations (Domenech et al., 2011). It has been demonstrated that these inadequate attitudes and beliefs towards back pain affects the advice physical therapist provide to patients (Houben et al., 2005). Therefore physical therapists should be provided with education regarding how to integrate the bio-psycho-social view in case of patients with chronic MSK pain. The CSM provides a comprehensive framework that enables physical therapists to question their MSK pain patients for specific illness perceptions. Recently our group explained in *Manual Therapy* Journal how physical therapists can reflect on their own beliefs and attitudes regarding MSK pain for actually changing their own behavior as a clinician (Nijs et al., 2013).

The domains *causes* of pain and *provoking factors* seem to be highly interrelated. Nevertheless, we choose to add the domain provoking factors since the nature of these illness perceptions are different. The cause is related to the physical or emotional causes of the origin of the chronic MSK pain, or to the occasion during the

onset of the chronic MSK pain. A provoking factor on the other hand is related to the current situation. During the scoring of the assessment, we noticed that these questions are important to understand the current health behavior of patients with chronic MSK pain. Physical therapists frequently ask for these pain provoking factors.

In this study we used the domains of the IPQ-R, this is a general questionnaire to inventory illness perceptions (Moss Morris et al., 2002). Authors adapted the IPQ-R to specific diseases such as diabetes, fibromyalgia and MSK pain (van Ittersum et al., 2009; Lawson et al., 2010; Nicholls et al., 2013). The factor structure of the IPQ-R in patients with MSK pain was investigated using a confirmative factor analysis in a group of patients with back, hand and knee pain (Nicholls et al., 2013). The seven CSM dimensions did not meet all criteria for a good model fit. An Explorative Factor analysis of the 18 causal items also produced an unstable factor structure that could not be interpreted. The back, hand and knee pain samples should be interpreted separately. This qualitative study also showed, particularly in the cause domain, a wealth of different illness perceptions among patients with MSK pain. These illness perceptions seem difficult to measure using a questionnaire. For clinical use open questions and elaborating on the answers during the assessments seems the most useful tool to objectify illness perceptions in MSK pain.

Before and during the study, based on the material from the recordings, we developed the GOSSIP. This instrument was used as a tool for systematically coding the illness perceptions questioned by the physical therapists and the answers of their patients. Although this instrument was useful, the coding of the Illness perception by the observers remained difficult in some cases, several cognitive constructs seem to overlap and were therefore difficult to assign to a specific domain.

A primary weakness of the study is that, although we obtained a very good 'overall impression' about how illness perceptions are asked for by physical therapists in case of MSK pain, we are aware of the fact that differences might exist between physical therapists. Several determinants might be related to these differences, such as additional education, the time used for the history taking, and the experience with MSK pain patients. Analyzing these differences was not the purpose of our study but could be undertaken in further studies.

We conclude that some of the domains of the CSM were frequently asked for (identity, causes and consequences), while others (timeline, treatment control, coherence, emotional representation) were used less frequent or seldom by physical therapists working with MSK pain patients. The overall impression is that the assessments of physical therapists were bio-medically oriented in patients with chronic MSK pain. Physical therapists should integrate more the specific domains of the Common Sense Model and also more psychosocial orientated questions to understand a patient's health behavior.

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