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CLINICAL COMMENTARY

The benefits of theory for clinical practice: Cognitive treatment for chronic low back pain patients as an illustrative example

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Abstract

Purpose. To demonstrate, with the help of an example of cognitive treatment for patients with chronic low back pain, how a systematic description of the content and theoretical underpinnings of treatment can help to improve clinical practice.

Methods. A conceptual analysis, two types of theories, and a programme-theory framework were instrumental in systematically specifying the content of the treatment and the underlying assumptions.

Results. A detailed description of the cognitive treatment, including: (i) The intended outcomes; (ii) the related treatment components; (iii) the therapeutic process that is expected to mediate between outcomes and components, (iv) the conditions for optimal application; and (v) the guiding principles.

Conclusions. The systematic description of the treatment revealed important issues for clinical practice, such as the patient and therapist characteristics that are needed for optimal provision of cognitive treatment. The discussions on the role of theory in rehabilitation practice are taken one step further in this clinical commentary: instead of simply describing the problems, we also demonstrated a means to tackle them.

Keywords: *Cognitive treatment, chronic low back pain, theory, clinical practice*

Introduction

Clinicians, by nature, are practical people. To ask them to embrace theory for the benefit of their daily practice seems to contradict common sense. In this clinical commentary we aim to demonstrate how a detailed description of interventions and their theoretical underpinnings provides more insight into the active components of a treatment. With knowledge of the active components, clinicians can provide the treatment more effectively [1,2]. Rather than adding a new component to an intervention with unknown content, clinicians can add, refine or eliminate components to a well described intervention. We do not stop at demonstrating how theory can be of benefit for daily practice; we hope to inspire others to make detailed descriptions of other interventions with the help of two tools, which we

introduce for structuring the description of treatment. If the treatment is described in this systematic way, uniformity in the description will facilitate aid comparison of treatments, and it will increase our understanding of the processes that underlie rehabilitation treatment.

It is not an easy task in which we invite our readers to participate. Rehabilitation is perhaps the archetypical complex intervention [3], and it is therefore difficult to describe its content in detail. Multi-disciplinary rehabilitation interventions are especially complex, because they incorporate the knowledge and skills of various health professionals [1]. This is one of the reasons why most authors only plead for the specification of treatment and the integration of theory in clinical trials. However, the way in which the content of complex interventions can be specified is not yet clear [1,3,4].

Although there is increasing awareness of the importance of theory in the field of rehabilitation and rehabilitation research, the current discussions about theory cover a variety of subjects and are directed towards a diversity of goals. It has been suggested that theory is useful in the early phases of the design of a randomized controlled trial [1]. Others have suggested that an integrative theory is useful in combining the numerous interdisciplinary aspects of rehabilitation, in defining boundaries for the field of rehabilitation, and in strengthening the position of rehabilitation in competition with other medical professions [4]. It has also been claimed that rehabilitation practice is mainly a-theoretical, and a classifications system to form the basis of rehabilitation have been advocated [3]. Others have suggested that we need more than a descriptive classification system: theories are still needed to understand how activity limitation arises and how treatments alter activity limitations [5].

In this paper we do not focus on discussions about theory, but on what can be gained in clinical practice from applying theory. It is our intention to narrow the gap between theory and clinical practice and to demonstrate to the reader that there is 'nothing more practical than a good theory' [6, p. 169]. We do this by making clinical practice the object of study, i.e., systematically describing in detail the current situation, guided by theories.

How can we begin to analyze the content of complex interventions? This is where theory comes in. Theories are sets of inter-related assumptions that are made in order to explain important processes, and they are therefore of assistance in selecting the most relevant variables [1]. We used two tools to structure the complexity of the interventions: (i) Theories categorized according to the role they play in rehabilitation, and (ii) a conceptual framework to describe relevant areas of treatment theory. How these tools were of assistance is described in the following sections of this paper, in which we analyse cognitive treatment for chronic low back pain patients as an example.

The first tool is of assistance in determining the type of theories that are incorporated in treatment. According to Kazdin [7], two types of theory can be distinguished: (i) Theory about the nature of the problem (theory of dysfunction), i.e., the conceptual underpinnings and hypothesis about the factors that are likely to lead to the clinical concept of functioning, the processes involved, and how these processes emerge or operate, and (ii) theory about solutions to the problem (theory of treatment), i.e., the conceptual underpinnings of the process(es) of change during treatment, addressing questions such as 'What should treatment accomplish, and through what means and processes'. In the following section

we analyze how the definition of dysfunction in patients with low back pain changes over time, and how this is related to different theories explaining the role of dysfunction.

Theory of dysfunction in low back pain

In patients with low back pain the hypotheses about the factors that are likely to lead to the clinical problem evolve during the course of the illness. In patients with back problems that are recent, or that have not yet been medically examined, diagnosis is primarily aimed at pinpointing the physical cause of the problem, i.e. the underlying physiological pathology. With the help of diagnostic tests (e.g., X-ray and magnetic resonance imaging) and clinical reasoning, a medical diagnosis can be made (e.g., disc herniation). In this initial part of the diagnostic process biomedical theories are the most prevalent theories with regard to dysfunction. Physiological pathology is only found in 10–20% of patients with low back pain [8,9]. Low back pain is referred to as non-specific when there is no physiological cause that fully explains the back problem [10–12]. Such cases, if they do not improve within 12 weeks, are referred to as chronic [9]. With this change from acute to chronic, the low back problem is redefined, and consequently the range of hypotheses about the factors leading to the back problem is extended. The biomedical perspective on low back pain that guided the diagnostic process in the acute phase changes into a biopsychosocial perspective in the chronic phase [8,11,13]. Biomedical theories recede into the background, in favour of a vast field of psychosocial theories attempting to explain the persistence of the low back pain, such as treatments incorporating operant conditioning theories [14,15] and social cognitive theories [16–20]. These interventions vary considerably in their content, and are referred to as cognitive-behavioural treatment [21]. In the cognitive treatment that serves as an illustrative example in this paper, Leventhal's Self Regulation Model (SRM) [22,23] had considerable impact on its content, and because the SRM was the starting point for the development of the cognitive treatment, we need to know how the problem of low back pain was operationalized with help of the model.

The SRM describes the process by which individuals respond to a perceived health threat. The model postulates that symptoms generate both cognitive and emotional representations of the illness or health threat, and are generated by parallel processes. The SRM assumes that an individual first forms the representation (emotional and cognitive) of the illness, and subsequently adopts behaviours to cope with this [22,24–27]. The SRM distinguishes five dimensions of illness cognitions: (i) identity,

(ii) time-line, (iii) cause, (iv) consequences, and (v) control/cure. The dimension, '*identity*', refers to the symptoms experienced (e.g., pain, fatigue). The dimension, '*time-line*', reflects the patient's ideas about how long the illness will last, and whether it will be a temporary or a persistent problem, e.g., 'I will have increasingly more back problems for the rest of my life'. The dimension '*cause*', reflects the individual's ideas about the cause of the illness, e.g., 'we have weak backs in our family'. The dimension, '*consequences*', refers to the individual's ideas of the possible impact of the illness on his or her life, e.g., 'I'll end up in a wheelchair, and I'll lose my job'. The dimension '*control/cure*' includes the patient's ideas about whether or not the illness can be controlled by him/herself or by treatment, e.g., 'The only thing I can do to help my back problem is to lie down' or, 'Treatment won't help, I've tried so many things and nothing has worked' [22]. To assess the patient's illness cognitions, we included the Illness Perceptions Questionnaire (IPQ-R) [28,29] in our diagnostic assessment.

To return to the subject of theory of dysfunction: In the SRM a central position is given to illness cognitions which are generated and shaped by the symptoms that are experienced. Consequently, maladaptive illness cognitions are considered to be a potential factor contributing to the persistence of the problem. The SRM assumes that patients construct their own common-sense model of their illness, and that they incorporate in this model a variety of sources of information which are encountered over time; for example, the patient's own experiences with and knowledge about his/her illness, and advice given by others. These sources of information can either help or hinder adaptation to illness and recovery [22,30]. The informative role of the SRM in defining the problem also focuses on the patient's personal model of the illness. For clinical practice this provides relevant information, because it stresses the need for an understanding of the patient's personal opinion about his/her back problem before attempting to change it. The need for in-depth understanding of the personal model suggests that the treatment should be provided in a one-to-one setting, and not in group treatment.

In summary, in the definition of the dysfunction that low back pain causes, both biomedical and psychosocial theories play an important role, and the importance of the theories varies with the duration of the low back pain. For clinical practice it is important to define in detail the dysfunction that must be treated, because this determines the potential treatment options. To make rational treatment choices, the treatment content must also be described in detail. To systematically describe the theories

underlying the treatment, a second tool is introduced: a conceptual framework.

Theory of treatment

The central question in the theory of treatment is: 'What does the treatment aim to accomplish, and through what means and processes'. To describe the content and theoretical underpinnings of the cognitive treatment in a systematic way, and to identify potentially relevant variables, a second tool was used: A conceptual framework constructed by programme theorists [31,32]. Based on this framework, treatment can be specified in terms of (un)intended outcomes (output domain) and related treatment components (input domain), the therapeutic process that is expected to mediate between the outcomes and the treatment components (process domain), and the conditions needed for optimal application of the treatment programme (context domain). The ways in which biomedical and psychosocial theories have given shape to the content of the treatment programme (guiding principles) were also included in the analysis [33]. This framework, which is used to specify the content and theoretical underpinnings of our cognitive treatment, is shown in Figure 1.

Output domain

Specification of the output domain was guided by the question 'What are the (un)intended outcomes of the treatment programme?' Given the rehabilitation setting, the intended outcome of our cognitive treatment is at behavioural level: An increase in physical activities in patients with low back pain. The Patient-Specific Functioning List (PSFL) (PSK in Dutch) [34,35] was used to identify and specify physical activities which are difficult for the patient to perform. The PSFL asks patients to prioritise their daily activities and to select those activities that are most important to them. They are asked to select, from a list of 36 daily activities, those physical activities that they find difficult to perform, and which they would like to improve upon in the next 3 months. The three most important activities are the focus of individualized treatment goals and might, for instance, be formulated as 'standing in a queue in the supermarket for 15 minutes'.

Process domain

Specification of the process domain was guided by the question: 'What is the intervening process that is expected to mediate between the treatment components and the outcomes of the cognitive treatment?' According to Leventhal's SRM, the cognitive treatment operates on the premise that (health) behaviour

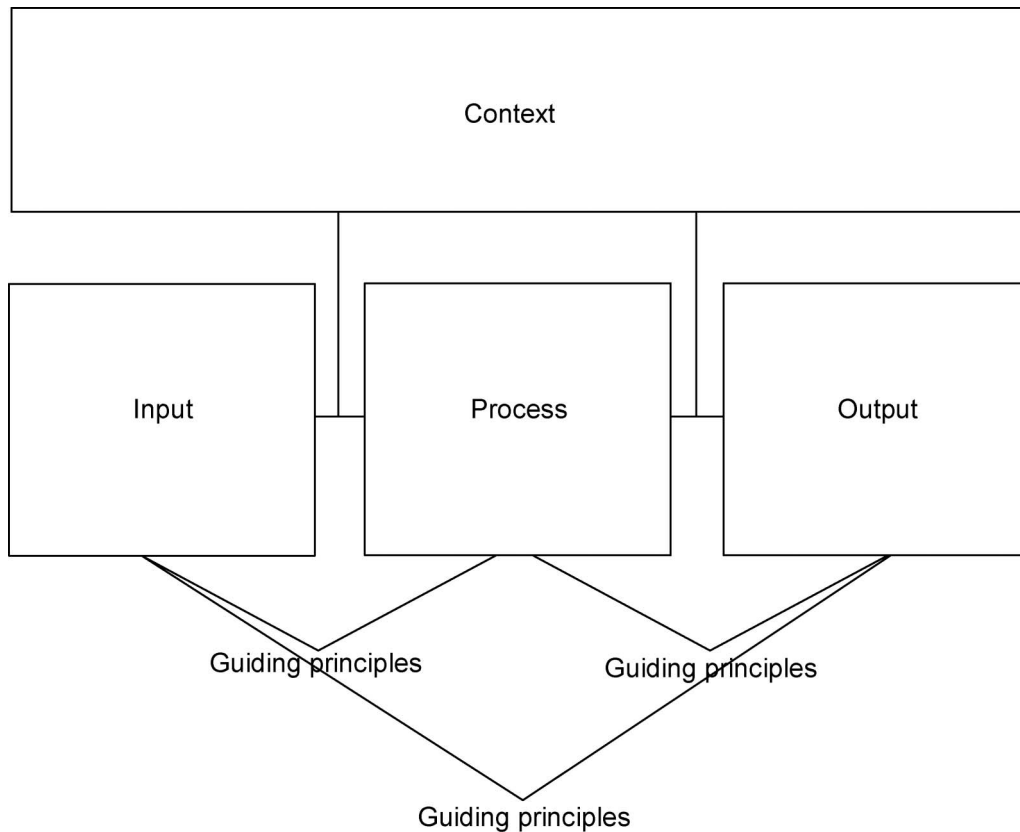


Figure 1. Program theory domains for therapy specification.

is governed by cognitions. Cognitive treatment is therefore designed to achieve cognitions that are conducive to physical activity, and the focus of cognitive treatment is on the illness cognitions that are related to physical activity. Therefore, an assumption underlying cognitive treatment is that in order to achieve a higher level of activity the illness cognitions must change, so that they become conducive to physical activity.

Input domain

Knowing that cognitions play a pivotal role in the patient's limitations in physical activity, we are faced with the question: 'How does cognitive treatment aim to change the patient's cognitions?' Two components emerged in the reflection process: (i) *Mental* experimentation, which focuses on changing cognitions, and (ii) *physical* experimentation, which is aimed at applying and testing cognitions during daily activities.

Mental experimentation. *Mental* experimentation is divided into four steps: (a) Mapping cognitions, (b) challenging maladaptive cognitions, (c) formulating alternative cognitions, and (d) strengthen the alternative cognitions.

The first step, the mapping of existing cognitions, is guided by the SRM assumption that it is important to have in-depth knowledge of the patient's common-sense model before trying to change the cognitions that constitute the individual model [25,36,37]. Using the answers to the IPQ-R, a Socratic style of dialogue [38,39] is used to invite patients to elaborate on their thoughts about their low back pain in relation to their limitations in activity. Causal cognitions were found to be a useful target for treatment [25,27,40]. In clinical practice, cognitions about cause were also found to be a useful starting point for the Socratic dialogue, because patients often have a definite idea about what is wrong (or might go wrong) with their back. Broadening the range of perceived causes was found to be a useful target for treatment [25,27], for example in patients who have a purely biomechanical causal model of their chronic back problem. Patients who struggle to understand their chronic back problem also seem to have a limited model of their illness, and report only a limited number of possible causes of their back problem on the IPQ. Therefore, mapping thus helps in the selection of treatment targets for the next step of mental experimentation.

The second step in mental experimentation, 'challenging maladaptive cognitions' is aimed at creating

doubt about the existing cognitions. Once patients are dissatisfied with the existing cognitions, they will be more open for alternative explanations.

The third step is 'formulating alternative cognitions' that are more conducive to physical activity. The therapist stimulates the patient to suggest alternative cognitions that seem plausible, and encourages the patient to extend the range of possible cognitions. Multiple sources of information are used to facilitate this process. The therapist initially fosters the exploration of alternative cognitions by asking the patient to compare his or her cognitions with those of significant others, searching for information in libraries or on the internet. This step ends when both the patient and the therapist feel that plausible and intelligible alternative cognitions have been found. Important in this step is to discuss the positive consequences for the patient of the alternative cognitions: i.e., how will they help the patient to achieve more physical activity in daily life. Patients may still feel insecure about the alternative cognitions, but they must be convinced that it is worthwhile to try to apply them in daily life.

The fourth step in mental experimentation is strengthening the newly acquired alternative cognitions. Therapists do this by asking the patient to think about situations that are particularly difficult, or reasons to doubt the credibility of the alternative cognitions (e.g., 'What if your pain gets worse, would you still think that it's harmless and just a phase?').

Physical experimentation. Physical experimentation focuses mainly on strengthening the alternative cognitions by confirming their utility in daily practice. For example, 'doing sports' is used as a physical experiment to strengthen the acquired alternative cognitions: 'Doing my favourite sports doesn't hurt my spine'. The physical experimentation can also be used to explore situations in which patients suspect that they may revert to maladaptive cognitions, i.e., when there still is doubt about the credibility of the alternative cognitions. For example, purposefully doing what the patient considers to be 'too much'.

Physical experimentation is not only applicable after mental experimentation has been completed, but can also be used in the process of mapping cognitions. For instance, patients may be asked to monitor those situations in which they stop or avoid activities, by keeping an activity diary. The diary notes are used in the treatment to pinpoint difficult situations and to further analyse the rationale for stopping or avoiding activities.

In summary, the main component of cognitive treatment is mental experimentation that starts off with mapping cognitions, then challenging illness cognitions, and subsequently developing realistic and coherent cognitions about activity limitations

and chronic low back pain. Physical experimentation is added to strengthen the newly acquired alternative cognitions.

Context domain

The context domain of the conceptual framework was investigated by addressing the question 'What are the conditions for optimal application of our cognitive treatment?' A critical contextual condition for mental experimentation in cognitive treatment is the Socratic dialogue and discussion style. Unfortunately, few authors clearly delineate the components of the Socratic method [41]. In order to achieve optimal results, the style for dialogues and discussion should be more specific than just 'asking the patient'. Our analyses of the cognitive treatment indicate that the therapist must be an expert in Socratic style dialogues, which means that the therapist must be able to play a different role in each step of the mental experimentation. When mapping existing cognitions the therapist has to take a naïve stance, when challenging the therapist must assume cognitions a more analytical and questioning role, when exploring alternative cognitions the therapist must rely on expert knowledge about chronic low back pain, and when testing the strength of alternative cognitions the therapist has to play devil's advocate. In the ideal treatment situation only one therapist should provide the treatment, because of the need for detailed knowledge about a patient's cognitions. It was felt that such detailed knowledge could not easily be transferred to other team members. A dilemma in choosing only one therapist is that knowledge and skills concerning cognitive treatment are traditionally the domain of psychologists, whereas knowledge of medical conditions and their impact on the performance of physical activities, and the skills that are needed to change physical abilities, pertain more to the domain of occupational therapists and physiotherapists. It was felt that for the skills and knowledge needed to provide cognitive treatment less training was necessary than for those needed to treat medical conditions and to train physical abilities. It was also argued that the patients themselves might consider paramedics to be the most appropriate experts, because in the first instance most patients considered their low back problem to be a physical and medical condition. Occupational therapists and physiotherapists were therefore considered to be the most appropriate providers of for cognitive treatment.

However, our cognitive treatment does not solely require that the therapist has the necessary qualities; the patient must also fulfil certain contextual conditions to be able to participate in such a dialogue. There is a need for verbal and reasoning skills to

achieve an open and fruitful discussion, and social skills are also required. Both the therapist and the patient must therefore be open-minded and contemplative in each stage of mental experimentation. A patient with good listening skills, who is open-minded and contemplative, might also be a more suitable candidate for cognitive treatment. Clinicians can take these variables into consideration when making decisions about patient and therapist characteristics. First of all, 'Which patients will benefit most from cognitive treatment?', and secondly, 'Which therapist is most appropriate to provide the cognitive treatment?'

Guiding principles

Guiding principles included in the framework are the ways in which biomedical and psychosocial theories have given shape to the content of the treatment. To specify the guiding principles of our cognitive treatment we addressed the question: 'Which biomedical and/or psychosocial theories shaped our cognitive treatment?'. In the SRM it is assumed that the ways in which people think about health threats are important in determining how they feel, and what they do in reaction to events [22]. In the SRM, thinking and feeling are two parallel processes [23]. Illness cognitions are part of the cognitive process:

what people think. The emotional process focuses on how people feel, and is important for emotional adjustment [42]. Cognitive and emotional processing take place at the same time, but our cognitive treatment does not focus on the regulation of distress by emotional processing. Only the cognitive path is followed as the guiding principle for cognitive treatment. Thus, cognitive treatment does not draw from all areas of the SRM. However, it is not only the SRM that has guided the development of cognitive treatment; other theories have also been applied. Strike and Posner [43] formulated three conditions in their theory of conceptual change, under which cognitive change is likely to occur, i.e., (i) dissatisfaction with an existing cognition, (ii) an intelligible and plausible alternative is available, and (iii) the new concept is beneficial. This knowledge about conditions for cognitive change was combined with Socratic style of dialogues, as described by Nelson and others [38,39]. Motor learning theories also emerged as guiding principles of our cognitive treatment, because they assume that the learning of physical activities may be best achieved if practised in a wide variety of contexts and in contexts that closely resemble situations in which the behaviour is needed. For this reason, homework is given and practised in a variety of situations. The situations are deliberately chosen from the patient's daily context. A general

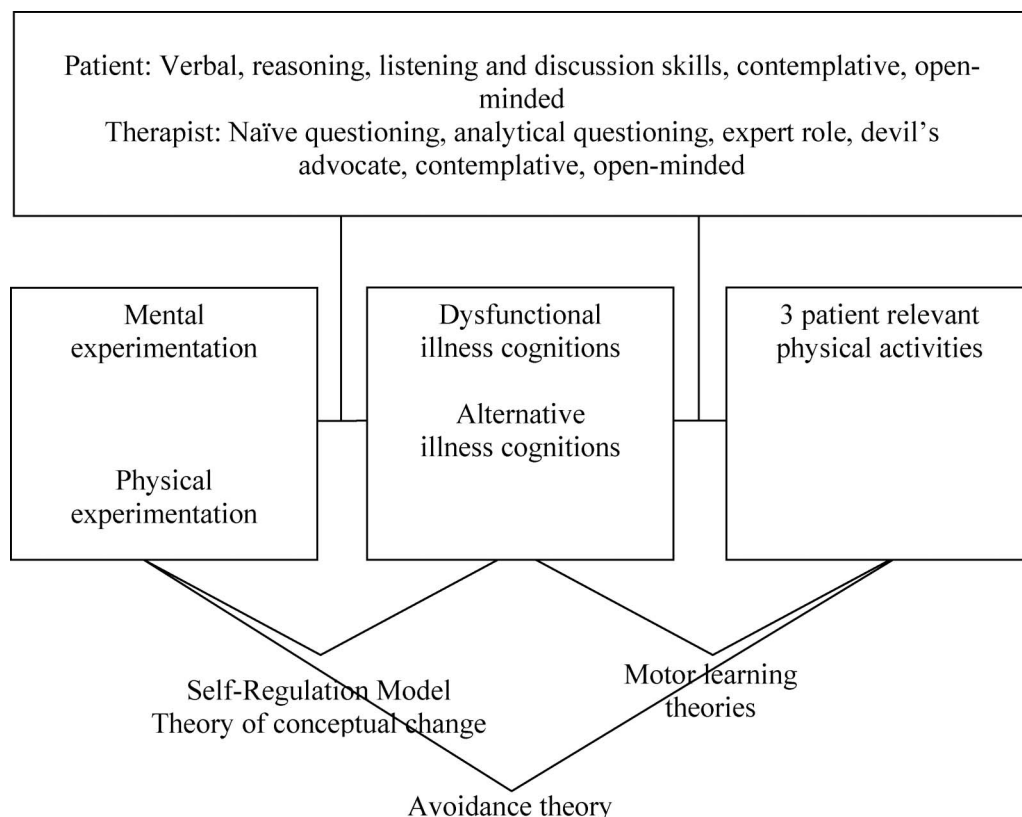


Figure 2. Specified domains and guiding principles of CT.

avoidance theory is introduced by choosing the aim of increasing physical activity. The role of motor learning theories and avoidance theory in our cognitive treatment is less detailed than that of the SRM or the theory of conceptual change. A graphical representation of the framework specified for cognitive treatment is shown in Figure 2.

Discussion and conclusion

In the field of rehabilitation research there is increasing awareness that theory has to be integrated in outcome studies to help improve both clinical practice and research [1–5,31,44–47]. It is argued that rehabilitation research should move beyond black box evaluations, by specifying the content and theoretical underpinnings of the treatment [2,5,31,45,46]. The objective of this article was to demonstrate, by means of an illustrative example, how such a description and specification process can be carried out in a systematic way, and to draw attention to possible implications. This example might help to explain to clinicians the content and assumptions of cognitive treatment, and thus enable them to decide how, why and for whom they provide such cognitive treatment in chronic low back pain rehabilitation. The graphical representation also provides clinicians with a framework for refining and improving cognitive treatment. However, our findings should not to be confused with scientific facts. The analyses are explications of thought processes and informed choices that would otherwise have remained implicit. Future research may provide evidence for both the hypothesis and the implications resulting from our analyses. These analyses, together with the results of research, can assist in increasing our knowledge of rehabilitation treatment in an efficient and systematic way.

With the help of the conceptual framework constructed by programme theorists, it became clear that the initial biomedical problem of the patient with chronic low back pain was redefined in the output domain as limitations in the performance of activities, for which the main explanation was illness cognitions. Mental and physical experimentations were identified as the most important treatment components in the input domain. Mental experimentation focuses on what the patient thinks, and aims to change maladaptive illness cognitions into alternative cognitions which are conducive to physical activities. Physical experimentation was added to strengthen the acquired alternative cognitions. So, in our cognitive treatment, mental experimentation links the input with the process domain, while physical experimentation links the input with the output domain. The guiding principles underlying the first link are cognitive theories, while motor

learning theories were identified as the guiding principles underlying the second link (see Figure 2).

Leventhal's SRM was the social cognitive theory that formed the starting point for the development of our treatment. The SRM was found to be influential in many different ways. To name a few: (i) The SRM helped to delineate the low back problem, and was identified as one of the theories of dysfunction, (ii) the SRM defined the type of cognitions that can be targeted in treatment, and (iii) the SRM stressed the individual nature of an individual model, and dictated that the treatment setting should also be individual, and not group treatment.

Benefits of the description and specification processes for clinicians are: (i) That they enable them to articulate how and why they give such content to cognitive treatment, (ii) they provide a framework for refinement and improvement of the treatment, and (iii) they provide a basis for referring patients to cognitive treatment, based on their personal characteristics. For example, we discovered that for the Socratic style dialogues that are used in cognitive treatment important characteristics are required from both patient and therapist. For successful provision of the treatment, the verbal and discussion skills and an open-minded approach appeared to be important issues that became obvious when specifying the content of the treatment.

In conclusion, the description and specification processes showed that the cognitive treatment is based on a complex set of theories, components and practices. Such complexities are often overlooked or ignored in both clinical practice and research. With our descriptions and specifications we positioned ourselves in a number of discussions on the role of theory in the field of rehabilitation. We did not strive to achieve a general theory of rehabilitation [3,4], or aim to facilitate research [1], but we have drawn attention to the fact that much more knowledge is incorporated within clinical practice than is often assumed. Our primary aim was to make this knowledge beneficial for the clinicians and the patients. This article has taken these discussions [1,3,4] one step further: Instead of simply describing the problems, we have also tried to find a means to tackle them and have illustrated how this can be one.

References

1. Campbell M, Fitzpatrick R, Haines A, Kinmonth AL, Sandercock P, Spiegelhalter D, Tyrer P. Framework for design and evaluation of complex interventions to improve health. *BMJ* 2000;321[Sept]:694–696.
2. Whyte J. Clinical trials in rehabilitation: What are the obstacles? *Am J Phys Med Rehabil* 2003;82(10 suppl.):s16–21.
3. Wade D. Describing rehabilitation interventions. *Clin Rehabil* 2005;19:811–818.

4. Siegert RJ, McPherson K, Dean S. Theory development and a science of rehabilitation. *Disabil Rehabil* 2005;27(24):1493–1501.
5. Lettinga AT, Twillert van S, Poels B, Postema K. Distinguishing theories of dysfunction, treatment and care. Reflections on 'Describing rehabilitation interventions'. *Clin Rehabil* 2006;20(369):369–374.
6. Lewin K. *Field theory in social science: Selected theoretical papers*. New York: Harper & Row; 1951.
7. Kazdin AE. Current (lack of) status of theory in child and adolescent psychotherapy research. *J Clin Child Psychol* 1999;28(4):533–543.
8. Truchon M. Determinants of chronic disability related to low back pain: Towards an integrative biopsychosocial model. *Disabil Rehabil* 2001;23(17):758–767.
9. Tulder van MW. *The effectiveness of conservative treatment of acute and chronic low back pain*. Amsterdam: EMGO-Institute; 1999.
10. Kent P, Keating J. Do primary care clinicians think that non-specific low back pain is one condition? *Spine* 2004;29(9):1022–1031.
11. Haldeman S. Presidential address, North American Spine Society: Failure of the pathology model to predict back pain. *Spine* 1990;15(7):718–724.
12. Nachemson A. Newest knowledge of Low Back Pain; a critical look. *Clin Orthopaed Rel Res* 1992;279:8–20.
13. Andersson G. Epidemiological features of chronic low-back pain. *Lancet* 1999;354(August 14):581–585.
14. Keefe FJ, Dunsmore J, Burnett R. Behavioral and cognitive-behavioral approaches to chronic pain: Recent advances and future directions. *J Consulting Clin Psychol* 1992;60(4):528–536.
15. Flor H, Knost B, Birbaumer N. The role of operant conditioning in chronic pain: An experimental investigation. *Pain* 2002;95:111–118.
16. Buchbinder R, Jolley D, Wyatt M. 2001 Volvo award winner clinical studies: Effects of a media campaign on back pain beliefs and its potential influence on management of low back pain in general practice. *Spine* 2001;26(23):2535–2542.
17. Buchbinder R, Jolley D, Wyatt M. Population based intervention to change back pain beliefs and disability: three part evaluation. *BMJ* 2001;322(23 June):1516–1520.
18. Turk DC, Monarch ES. Biopsychosocial perspective on chronic pain. In: Turk DC, Gatchel RJ, editors. *Psychological approaches to pain management; a practitioner's handbook*. 2nd ed. New York: The Guilford Press; 2002. pp 3–29.
19. Turk DC. A cognitive-behavioral perspective on treatment of chronic pain patients. In: Turk DC, Gatchel RJ, editors. *Psychological approaches to pain management; a practitioner's handbook*. 2nd ed. New York: The Guilford Press; 2002. pp 138–158.
20. Turk DC, Sherman JJ. Treatment of patients with fibromyalgia syndrome. In: Turk DC, Gatchel RJ, editors. *Psychological approaches to pain management; a practitioner's handbook*. 2nd ed. New York: The Guilford Press; 2002. pp 390–416.
21. Vlaeyen J, Morley S. Cognitive-behavioural treatments for chronic pain; what works for whom? *Clin J Pain* 2005; 21(1):1–8.
22. Leventhal H, Nerenz DR, Steele DJ. Illness representations and coping with health threats. In: Baum A, Taylor SE, Singer J, editors. *Handbook of psychology and health*. Hillsdale: Erlbaum; 1984. pp 219–252.
23. Leventhal H, Benyamini Y, Brownlee S, Diefenbach M, Leventhal EA, Patrick-Miller L, Robitaille C. Illness representations: Theoretical foundations. In: Petrie KJ, Weinman JA, editors. *Perceptions of health and illness*. London: Harwood Academic; 1997. pp 19–45.
24. Ogden J. *Illness cognitions. Health psychology, a textbook*. 2nd ed. Buckingham, Philadelphia: Open University Press; 2000. pp 36–58.
25. Petrie KJ, Cameron LD, Ellis CJ, Buick D, Weinman J. Changing illness perceptions after myocardial infarction: An early intervention randomized controlled trial. *Psychosom Med* 2002;64:580–586.
26. Petrie KJ, Weinman J, Sharpe N, Buckley J. Role of patients' view of their illness in predicting return to work and functioning after myocardial infarction: Longitudinal study. *BMJ* 1996;312(7040):1191–1194.
27. Leventhal H, Halm E, Horowitz C, Leventhal EA, Ozakinci G. Living with chronic illness: A contextualized, self-regulation approach. In: Sutton S, Baum A, Johnston M, editors. *The Sage Handbook of Health Psychology*. London: Sage Publications; 2004. pp 197–240.
28. Moss-Morris R, Weinman J, Petrie K, Horne R, Cameron L, Buick D. The revised illness perception questionnaire (IPQ-R). *Psychol Health* 2002;17(1):1–16.
29. Weinman J, Petrie K, Moss-Morris R, Horne R. The illness perception questionnaire: A new method for assessing the cognitive representation of illness. *Psychol Health* 1996;11: 431–445.
30. Hagger MS, Orbell S. A meta-analytic review of the common-sense model of illness representations. *Psychol Health* 2003;18(2):141–184.
31. Keith RA, Lipsey MW. The role of theory in rehabilitation assessment, treatment and outcomes. In: Glueckauf RL, Sechrest LB, Bond GR, McDonel EC, editors. *Improving rehabilitation assessment practices: Issues and new direction*. Beverly Hills: Sage Publications; 1993. pp 33–58.
32. Chen H-T. *Theory-driven evaluations*. London: Sage Publications; 1990. p 1.
33. Lettinga AT, Siemonsma P, Veen van M. Entwinement of theory and practice in physiotherapy. *Physiotherapy* 1999;85(9):476–490.
34. Beurskens A, Vet de HCW, Koke A, Lindemam E, Heijden van der GJ, Regtop W, Knipschild PG. A patient-specific approach for measuring functional status in low back pain. *J Manipulat Physiol Therapeutics* 1999;22(3): 144–148.
35. Beurskens A, Vet de HCW, Koke A. Responsiveness of functional status in low back pain: A comparison of different instruments. *Pain* 1996;65(1):71–76.
36. Weinman J, Petrie KJ. Illness perceptions: A new paradigm for psychosomatics? (Abstract). *J Psychosom Res* 1997;42: 113–116.
37. Scharf Donovan H, Ward S. A representational approach to patient education. *J Nursing Scholarship* 2001;(third quarter): 211–216.
38. Nelson L. *The Socratic Method [in Dutch: De socratische methode]*. Amsterdam: Boom; 1994. p 5.
39. Vincelli F, Choi Y, Molinari E, Wiederhold B, Riva G. Experimental cognitive therapy for the treatment of panic disorders with agoraphobia: Definition of a clinical protocol. *Cyber Psychol Behav* 2000;3(3):375–386.
40. Pimm TJ, Weinman J. Applying Leventhal's self-regulation model to adaptation and intervention in rheumatic disease. *Clin Psychol Psychother* 1998;5:62–75.
41. Overholser JC. The Socratic method as a technique in psychotherapy supervision. *Prof Psychol: Res Pract* 1991; 22(1):68–74.
42. Cameron LD. Anxiety, cognition, and responses to health threats. In: Cameron LD, Leventhal H, editors. *The self-regulation of health and illness behaviour*. London: Routledge; 2003. pp 157–183.

43. Strike KA, Posner GJ. A revisionist theory of conceptual change. In: Duschl RA, Hamilton RJ, editors. *Philosophy of science, cognitive psychology, and educational theory and practice*. Albany: State University of New York Press; 1992. pp 147–176.
44. Fuhrer MJ. Overview of clinical trials in medical rehabilitation. Impetuses, challenges, and needed future directions. *Am J Phys Med Rehabil* 2003;82(10 suppl.):s8–15.
45. Lettinga A, Reynders K, Mulder Th, Mol A. Pitfalls in effectiveness research: A comparative analysis of treatment goals and outcome measures in stroke rehabilitation. *Clin Rehabil* 2002;16:174–181.
46. Johnston MV, Stineman M, Velozo CA. Outcome research in medical rehabilitation: Foundations from the past and directions for the future. In: Fuhrer MJ, editor. *Assessing medical rehabilitation practices: The promise of outcome research*. Baltimore: Paul H. Brookes; 1997. pp 1–41.
47. Keith RA. The role of treatment theory. In: Fuhrer MJ, editor. *Assessing medical rehabilitation practices: The promise of outcome research*. Baltimore: Paul H. Brookes; 1997. pp 257–274.