

Supplementary material to article by A. de Rooij et al. "Cognitive Mechanisms of Change in Multidisciplinary Treatment OF Patients with Chronic WideSpread Pain: A Prospective Cohort Study"

APPENDIX SI. Descriptive information and psychometric properties of the outcome measures and measures of cognitions

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*Outcome measures*

*Pain* was assessed with the Numerical Rating Scale Pain (NRS) (range 0–10). The end-points of the scale are no pain and worst possible pain. Adequate psychometric properties have been documented (22).

*Physical functioning* was assessed with the subscale "interference of pain in daily living" of the Multidimensional Pain Inventory (MPI) (23). The MPI consists of 13 empirically derived scales that measure different pain-related aspects. The subscale interference assesses patient's perceptions about how pain interferes with their daily lives. A higher score means more interference of pain in daily life. The MPI has been widely used in diverse chronic pain samples and has good psychometric properties (23).

*Emotional functioning* was assessed with the Beck Depression Inventory II (BDI-II). The BDI-II is a self-reported measure that assesses cognitive, affective, and somatic symptoms of depression. The 21 questions are rated from 0 to 3 in terms of intensity. A higher score on the BDI-II (range 0–63) indicates more depressive symptoms (24, 25). The BDI-II has been shown to have adequate psychometric properties (26).

*Global perceived effect (GPE)* due to treatment was assessed with a 7-point Likert scale: from the complaints in global health "have disappeared", "are much improved", "slightly improved", "not changed", "slightly worsened", "much worsened", and "very much worsened". The scale was dichotomized into 0=no change/worse and 1=improved.

*Measures of cognitions*

The cognitive variables described below are arranged according to the 3 cognitive domains found in our previous study (19), i.e. negative emotional cognitions, active cognitive coping, and control and chronicity beliefs.

*Negative emotional cognitions*

Negative emotional cognitions were assessed with 3 questionnaires. Three subscales of the Revised Illness Perceptions Questionnaire (IPQ-R) were used to assess the illness beliefs: (1) "*consequences*" – expected effects and outcome of the illness; (2) "*coherence*" – patient's logical and complete understanding of the illness; and (3) "*emotional representations*" – negative emotional reactions, such as anger and fear, related to the illness. Items in these scales are rated on a 5-point Likert scale, ranging from "strongly disagree" to "strongly agree". High scores indicate: (1) more consequences (range 6–30), (2) lower coherence (range 5–25), and (3) more emotional reactions (range 6–30). The validity and reliability of the IPQ-R have been documented (27–29).

The Dutch General Self-efficacy Scale (DGSS) was used to measure *general self-efficacy beliefs*. General self-efficacy is defined as a broad and stable sense of personal competence to deal effectively with a variety of stressful situations (30). The DGSS consists of 10 items, and are answered on a 4-point scale, ranging from "not at all true" to "exactly true", with a higher score (range 10–40) indicating a higher self-efficacy. The psychometric properties of the DGSS have been documented (31, 32).

The Dutch adaptation of the Coping Strategy Questionnaire (CSQ) was used to assess the cognitive coping style "*catastrophizing*" – having negative thoughts and ideas about the impact of pain. The subscale catastrophizing consists of 6 items and, per item, the subject indicated to what extent this particular coping strategy was utilized. A higher score indicated that the subject used catastrophizing more often. The validity and reliability of the CSQ have been documented (33).

*Active cognitive coping*

Four subscales of the Dutch adaptation of the CSQ, were used to assess the active cognitive coping styles; (1) "*denial of pain sensations*" – denying that the sensations are painful and that they influence daily activities; (2) "*positive self-statements*" – telling yourself that you can handle the pain, regardless of its severity; (3) "*reinterpreting pain sensations*" – visualizing something that is not compatible with the true pain experience; and (4) "*diverting attention away from pain sensations*" – thinking of something to distract your attention away from the pain. Each subscale consists of 6 items and, per item, the subject indicated to what extent this particular coping strategy was utilized. For the description of the scale, see above.

*Control and chronicity beliefs*

Control and chronicity beliefs were assessed with the use of 2 questionnaires. The Revised Illness Perceptions Questionnaire (IPQ-R), described above, was used to measure the illness beliefs; (1) "*timeline*" – chronic timeline expectancies of the illness; (2) "*timeline cyclical*" – expectancies on the variability of the illness; (3) "*personal control*" – extent to which patients believe they can control the illness; and (4) "*treatment control*" – belief in treatment and recommended advice. Higher scores on personal control (range 6–30) and treatment control (range 5–25) demonstrate positive beliefs about the controllability of the illness. High scores on timeline (range 6–30) and timeline cyclical (range 4–20) demonstrate strongly held beliefs about the chronicity of the illness, and the cyclical nature of the illness.

The Dutch adaptation of the CSQ, described above, was used to assess the cognitive coping style "*perceived control over pain*" – controllability of the pain.

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