

# What is the effect of perioperative rehabilitation in patients with lumbar arthrodesis? A systematic review and categorization according to the ICF framework

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**Introduction:** Despite the controversy about arthrodesis surgery for low back pain, operation rates increased in the past two decades. Unfortunately, up to 40% of operated patients experience persisting pain and disability although biopsychosocial mediators already have been investigated. There is no consensus on optimal rehabilitation following lumbar arthrodesis.

**Aim:** The purpose of this systematic review was to describe rehabilitation interventions in patients following lumbar arthrodesis into biopsychosocial categories and to evaluate their efficacy on the different components of the International Classification of Functioning, Disability and Health (ICF).

**Materials and Methods:** Two independent reviewers searched six electronic databases for relevant articles describing perioperative rehabilitation in a population with single or double level lumbar arthrodesis. Interventions were subdivided based on their specific focus on biological, psychological, social components or combined. Outcomes were described according to the ICF framework. Risk of bias (ROB) was assessed using a modified Cochrane Collaboration tool, and quality of studies was reported by STROBE and CONSORT.

**Results:** Twenty-five studies were selected (2387 participants in total). After psychological interventions, compared to without, patients showed less disability and an overall trend towards reduction of fear avoidance beliefs and catastrophizing. Therapies combining exercise and psychological interventions showed less disability, more return to work, and improvements on kinesiophobia, self-efficacy, back beliefs, coping and health-related quality of life compared to usual care. Due to a small amount of studies describing biological and social interventions valuable conclusions regarding their effectiveness could not be made. Many criteria of the ROB assessment were generally unclear.

**Conclusion:** While a wide range of intervention types and outcome measures was used through all studies, we found that interventions combining cognitive-behavioural and exercise therapy retrieved significant better results on most components of the ICF framework.

**Implications:** Future research should explore even more timing and modalities of perioperative rehabilitation among homogenous lumbar arthrodesis groups.

**Keywords:** spinal fusion – arthrodesis – lumbar region – rehabilitation – exercise therapy – cognitive-behavioural therapy

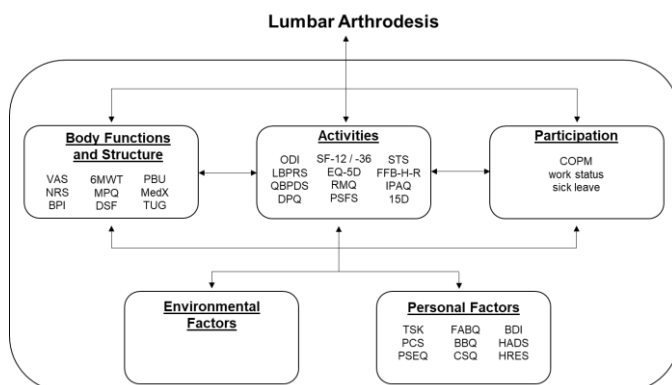


Fig Outcomes according to ICF

VAS: Visual Analog Scale. NRS: Numeric Rating Scale. BPI: Brief Pain Inventory. 6MWT: 6-Minute Walk Test. MPQ: McGill Pain Questionnaire. DSF: Deutscher Schmerz Fragebogen. PBU: Pressure Biofeedback Unit. TUG: Timed Up and Go. ODI: Oswestry Disability Index. LBPRS: Low Back Pain Rating Scale. QBPDS: Quebec Back Pain Disability Scale. DPQ: Dallas Pain Questionnaire. SF-12/36: 12/36-item Short Form Health Survey. EQ-5D: EuroQoL 5 dimensions health related quality of life. RMIQ: Roland Morris Questionnaire. PSFS: Patient Specific Function Scale. STS: Sit To Stand. FFB-H-R: Funktionsfragebogen Hannover-Rücken. IPAQ: International Physical Activity Questionnaire. 15D: 15 Dimensions health related quality of life. COPM: Canadian Occupational Performance Measure. TSK: Tampa Scale of Kinesiophobia. PCS: Pain Catastrophizing Scale. PSEQ: Pain Self-Efficacy Questionnaire. FABQ: Fear Avoidance Beliefs Questionnaire. BBQ: Back Beliefs Questionnaire. CSQ: Coping Strategies Questionnaire. BDI: Beck Depression Inventory. HADS: Hospital Anxiety and Depression Scale. HRES: Hopkins Rehabilitation Engagement rating Scale.