

Specific or non-specific exercises for patients with low back pain and movement control impairment

Citation for published version (APA):

Saner-Bissig, J. H. (2018). *Specific or non-specific exercises for patients with low back pain and movement control impairment: What works?* [Doctoral Thesis, Maastricht University]. Maastricht University. <https://doi.org/10.26481/dis.20180906js>

Document status and date:

Published: 01/01/2018

DOI:

[10.26481/dis.20180906js](https://doi.org/10.26481/dis.20180906js)

Document Version:

Publisher's PDF, also known as Version of record

Please check the document version of this publication:

- A submitted manuscript is the version of the article upon submission and before peer-review. There can be important differences between the submitted version and the official published version of record. People interested in the research are advised to contact the author for the final version of the publication, or visit the DOI to the publisher's website.
- The final author version and the galley proof are versions of the publication after peer review.
- The final published version features the final layout of the paper including the volume, issue and page numbers.

[Link to publication](#)

General rights

Copyright and moral rights for the publications made accessible in the public portal are retained by the authors and/or other copyright owners and it is a condition of accessing publications that users recognise and abide by the legal requirements associated with these rights.

- Users may download and print one copy of any publication from the public portal for the purpose of private study or research.
- You may not further distribute the material or use it for any profit-making activity or commercial gain
- You may freely distribute the URL identifying the publication in the public portal.

If the publication is distributed under the terms of Article 25fa of the Dutch Copyright Act, indicated by the "Taverne" license above, please follow below link for the End User Agreement:

www.umlib.nl/taverne-license

Take down policy

If you believe that this document breaches copyright please contact us at:

repository@maastrichtuniversity.nl

providing details and we will investigate your claim.

Valorisation

This thesis provides us with additional knowledge on exercise interventions for patients with subacute and chronic low back pain. Earlier chapters addressed the scientific and clinical aspects of both our quantitative and qualitative investigations. This valorisation section will discuss further insights gained from the thesis, such as innovation, the social and economic relevance of the findings, proposed potential target group and description of the issues associated with knowledge transfer.

INNOVATION

Exercises for the treatment of low back pain (LBP) are widely prescribed in clinical practice and are recommended in many guidelines (1-3). These guidelines refer to the high quality evidence on exercise therapy. However, it is also noted that the particular types of exercise which are most effective are still largely unknown.

The data outlined in this thesis provide clinicians with the relevant arguments to make an evidence-based clinical decision (4, 5). When deciding on exercise therapy for patients with LBP, physiotherapists base their choice of exercises on various assessments and clinical decisions. The decision on which type of exercise intervention to apply is based both on the physical presentation of the patient and on the psychological and social aspects of the patient's situation. This has led to heterogeneous exercises for the treatment of low back pain, with effects on: firstly, the evaluation of the individual treatment; secondly, the comparison between treatments; and lastly, the scientific analysis of treatment outcomes. The results of this thesis have defined standardised exercise treatments and analysed outcomes for a new subgroup of patients with LBP and movement control impairment (6, 7).

The main focus of this thesis is on the long-term effects of exercise, since it is known that the chronic progression of low back pain is responsible for major social and personal problems (8). We expected to gain new insights through focusing on a specific subgroup of patients with LBP (9, 10). In this randomised, controlled, multicentre study, the selected subgroup of patients with low back pain and movement control impairment (MCI) presented with a measurable mechanical movement control problem (11-13). We hypothesised that this subgroup would respond more favourably to a specific tailored exercise program compared to a general non-specific programme. Our results revealed, however, that this subgroup benefitted equally from both types of exercise programme. Patients improved in function and activity restriction following both types of exercise programme, as long as there was adherence to the programme. The improvement was maintained over the course of one year for both programmes. Thus, both exercise programs can be recommended for this patient group, with the expectation that they bring improved function and less pain in the short *and* long terms. It seems that adherence is more important than the specificity of the exercise programme.

The duration of physiotherapy treatment and exercise instruction to prevent or improve LBP is usually restricted. Following intervention, patients are usually recommended

to adhere to their exercise programme over the long term. We know from previous studies that adherence to an exercise program decreases substantially over the long term (14, 15). In the main study of this thesis, the adherence rate to exercise, of at least twice a week for both exercise programmes, was high at 60% after 6 months and 48% after one year. The results of the qualitative evaluation of this one-year, self-treatment phase indicated that patients felt reassured that they were exercising correctly and, as a result, chose to include the recommended programme into their regular, self-initiated physical activity programme. For clinicians, these results provide important insights into improving exercise adherence when advising patients on specific exercise strategies. Strategies for long-term exercise adherence help patients to commit over the long term, support their self-management capabilities and adapt to individual demands (16).

SOCIAL AND ECONOMIC RELEVANCE

Low back pain is ranked as the greatest contributor to global disability, measured in terms of Years lived with Disability (YLD) (17). A single episode of back pain usually runs its course with a favourable outcome in the majority of patients and has no significant social or economic impact. However, in those populations with subacute and chronic low back pain, work absenteeism or long-term disability are drivers of unfavourable social and economic costs (18). The need for cost-effective and evidence-based treatments for these patient groups, in order to restore their function and allow their renewed contribution to the work force, is clear.

In addition to confirming previously published results on the beneficial effects of exercise, this thesis also provides evidence of the continuing favourable effects over the course of one year (1, 2). Regular exercise is particularly effective in patients with subacute and chronic low back pain and movement control impairment. We recommended that physiotherapists guide patients through the learning process with patient-centred instruction until the patient has developed sufficient confidence in the exercise routine and its outcomes (16).

The long-term improvement in health, as described above, could have positive effects on both the social and economic costs. However, this thesis did not assess the costs of treatments against their impact on the economic burden. Neither was a social cost-benefit analysis of alternative therapeutic options for patients with low back pain performed.

TARGET GROUP

The studies in this thesis are of relevance to the large group of patients who suffer from longer-term low back pain and, in particular, to patients who present with signs of movement control impairment. This thesis has shown that adherence to a regular exercise programme can measurably improve function and reduce activity restriction due to pain.

The results also aid medical decision-makers who want to prescribe evidence-based treatments to their patients. In the context of physiotherapy treatment, the instruction,

motivation and coaching of patients to perform exercise, as recommended in the various studies of this thesis, is a safe and highly accepted treatment option.

TRANSFER OF KNOWLEDGE

The transfer of new knowledge into clinical practice has been described as difficult, particularly in the context that experimental study designs are not seen as reflective of the everyday needs of clinics (19, 20). Our multicentre study demanded high acceptance from the involved professionals. Fourteen clinics and over fifty physiotherapists provided assessment, treatment and control support during the treatment phase of our project. The implementation of the two treatment arms faced no major difficulties, since both were already widely used in clinical practice. It became clear that the provided exercises, at least from the viewpoint of our participants, formed a feasible and adequate treatment option.

Further results described in this thesis lead to recommendations to clinicians on motivational and coaching strategies to enable patients to stay adherent to exercise over the long term (16). The provision of knowledge on the positive prospects for patients who present with signs and symptoms of movement control impairment, if they follow either of the two treatments described in this thesis, should be an essential part of physiotherapy treatment.

Conclusion

Exercise therapy is a well-accepted treatment option by clinicians and patients suffering from low back pain. Based on the results of our large, randomised, controlled, multicentre trial, we were not able to find a final answer to the long sought-after question, "Which exercise is best for whom?".

We have shown that patients with LBP and movement control impairment benefit from two types of exercise programme. Both programmes can clearly be recommended for treatment of this patient group. This improvement not only increases functional ability, but may also have favourable impacts on their social and economic burdens.

For future studies, an analysis of the costs and benefits of alternative therapeutic exercise treatments, which include clear recommendations and coaching on exercise adherence, and their assumed impacts on the social and economic burdens may be of interest.

References

1. Bundesärztekammer (BÄK) KBK, Arbeitsgemeinschaft der Wissenschaftlichen Medizinischen Fachgesellschaften (AWMF). Nationale Versorgungsleitlinie Nicht-spezifischer Kreuzschmerz – Langfassung. 2017. Available from: www.kreuzschmerz.versorgungsleitlinien.de.
2. Koes BW, van Tulder M, Lin CW, Macedo LG, McAuley J, Maher C. An updated overview of clinical guidelines for the management of non-specific low back pain in primary care. *Eur Spine J.* 2010;19(12):2075-94.
3. Macedo LG, Bostick GP, Maher CG. Exercise for prevention of recurrences of nonspecific low back pain. *Phys Ther.* 2013;93(12):1587-91.
4. Childs JD, Flynn TW. Clinical decision making for low back pain: a step in the right direction. *J Orthop Sports Phys Ther.* 2014;44(1):1-2.
5. Rabin A, Shashua A, Pizem K, Dickstein R, Dar G. A clinical prediction rule to identify patients with low back pain who are likely to experience short-term success following lumbar stabilization exercises: a randomized controlled validation study. *J Orthop Sports Phys Ther.* 2014;44(1):6-B13.
6. Brennan GP, Fritz JM, Hunter SJ, Thackeray A, Delitto A, Erhard RE. Identifying subgroups of patients with acute/subacute "nonspecific" low back pain: results of a randomized clinical trial. *Spine (Phila Pa 1976).* 2006;31(6):623-31.
7. Kent P, Keating JL, Leboeuf-Yde C. Research methods for subgrouping low back pain. *BMC Med Res Methodol.* 2010;10:62.
8. Hartvigsen J, Hancock MJ, Kongsted A, Louw Q, Ferreira ML, Genevay S, et al. What low back pain is and why we need to pay attention. *Lancet.* 2018.
9. Dankaerts W, O'Sullivan P, Burnett A, Straker L, Davey P, Gupta R. Discriminating healthy controls and two clinical subgroups of nonspecific chronic low back pain patients using trunk muscle activation and lumbosacral kinematics of postures and movements: a statistical classification model. *Spine (Phila Pa 1976).* 2009;34(15):1610-8.
10. Karayannis NV, Jull GA, Hodges PW. Physiotherapy movement based classification approaches to low back pain: comparison of subgroups through review and developer/expert survey. *BMC Musculoskelet Disord.* 2012;13:24.
11. Saner J, Kool J, de Bie RA, Sieben JM, Luomajoki H. Movement control exercise versus general exercise to reduce disability in patients with low back pain and movement control impairment. A randomised controlled trial. *BMC Musculoskelet Disord.* 2011;12:207.
12. Saner J, Kool J, Sieben JM, Luomajoki H, Bastiaenen CH, de Bie RA. A tailored exercise program versus general exercise for a subgroup of patients with low back pain and movement control impairment: A randomised controlled trial with one-year follow-up. *Man Ther.* 2015;20(5):672-9.
13. Saner J, Sieben JM, Kool J, Luomajoki H, Bastiaenen CH, de Bie RA. A tailored exercise program versus general exercise for a subgroup of patients with low back pain and movement control impairment: Short-term results of a randomised controlled trial. *J Bodyw Mov Ther.* 2016;20(1):189-202.
14. Friedrich M, Gittler G, Arendasy M, Friedrich KM. Long-term effect of a combined exercise and motivational program on the level of disability of patients with chronic low back pain. *Spine (Phila Pa 1976).* 2005;30(9):995-1000.
15. Beinart NA, Goodchild CE, Weinman JA, Ayis S, Godfrey EL. Individual and intervention-related factors associated with adherence to home exercise in chronic low back pain: a systematic review. *Spine J.* 2013;13(12):1940-50.
16. Saner Jeannette, Bergman Esther M, de Bie Rob A., Sieben Judith M., Patients' strategies and barriers to successful long-term adherence to home-based exercise programmes in physiotherapy. . submitted. 2018.
17. Hoy D, March L, Brooks P, Blyth F, Woolf A, Bain C, et al. The global burden of low back pain: estimates from the Global Burden of Disease 2010 study. *Ann Rheum Dis.* 2014;73(6):968-74.

18. Juniper M, Le TK, Mladsi D. The epidemiology, economic burden, and pharmacological treatment of chronic low back pain in France, Germany, Italy, Spain and the UK: a literature-based review. *Expert opinion on pharmacotherapy*. 2009;10(16):2581-92.
19. Scurlock-Evans L, Upton P, Upton D. Evidence-based practice in physiotherapy: a systematic review of barriers, enablers and interventions. *Physiotherapy*. 2014;100(3):208-19.
20. Kerry R. Expanding our perspectives on research in musculoskeletal science and practice. *Musculoskeletal science & practice*. 2017;32:114-9.