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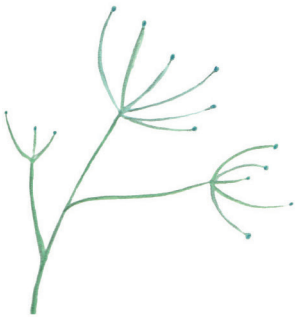
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Chapter 1

General Introduction



GENERAL INTRODUCTION

Low back pain (LBP), commonly defined as 'pain in the area on the posterior aspect of the body from the lower margin of the twelfth ribs to the lower gluteal folds, with or without pain referred into one or both lower limbs' is one of the most common health care problems worldwide.^[1] Over 80% of the population will experience low back pain at some point in their lives, and after a first episode of LBP, many people experience ongoing and recurrent episodes.^[2-4] Globally, the 1-year prevalence of LBP is estimated to be 38%.^[5] The prevalence and burden of LBP increase with age.^[1] The increasing share of older people throughout the world requires effective ways to alleviate the burden of LBP even more so.^[6]

The Global Burden of Disease Study showed that LBP causes more global disability than any other condition.^[1] It was responsible for 83 million years lived with disability (DALYs) in 2010, an increase from 58.2 million in 1990.^[1,7] Consequences of LBP on individual lives include loss of function impacting domestic and leisure activities, difficulties at work (e.g. having to arrange modified tasks, fear of job loss), stigma (e.g. concerning legitimacy, credibility, and validation of disease), and psychological challenges (e.g. anger, confusion, depression, fear).^[8]

Although LBP is highly prevalent, in 80 to 95% of people experiencing LBP no specific underlying cause such as pathology or neurological damage can be found.^[9-10] Despite of the absence of a specific cause, spontaneous recovery is observed in only 33% of patients within the first 3 months.^[11] About 5 to 20% of LBP cases will become chronic (>3 months duration), with 12% of the population being disabled by chronic LBP.^[5,12-13] In this thesis, when mentioning LBP, it refers non-specific LBP.

Economic burden of low back pain

In industrialized countries, LBP is one of the most common conditions for which people seek medical care, and healthcare costs for LBP are considerable.^[14] A large variety of health care providers offer treatments for LBP, which poses a challenge for the reduction of variations in care and health care costs for LBP. Common health care services used by patients with LBP include ambulatory care (e.g. general practitioner, physiotherapist, manual therapist, chiropractor, osteopath), hospital services (e.g. consultations with medical specialists, laboratory testing and MR imaging), pain alleviators (e.g. non-steroidal anti-inflammatory drugs, epidural corticosteroids), and alternative therapies such as massage and acupuncture.^[15-16]

The costs for LBP can be divided into direct (medical and non-medical) and indirect costs. Direct medical costs include costs such as those incurred for physician and hospital services, physiotherapy, alternative medicine, diagnostic testing, and (over-the-counter) medication use. Direct non-medical costs include for example travel costs to attend medical appointments.

Indirect costs include costs related to productivity loss (e.g. work absenteeism and presenteeism, which is the act of working while sick and being unable to function fully, household and unpaid productivity losses).^[17] The costs of LBP have been estimated in various countries and varied from AUD 9.2 billion in Australia to £ 12.3 billion in the United Kingdom and as much as USD 91 billion in the United States.^[18-20] The vast majority of these costs are attributable to indirect costs, about 85 to 90%.^[17] In the Netherlands, the economic burden of LBP amounted to € 4.6 billion in 1991.^[21] This number has not changed much over the decades, with a healthcare bill for LBP of € 3.5 billion in 2007, of which 88% were due to indirect costs.^[22]

Risk factors for low back pain

A variety of risk factors have been proposed that could explain the onset, recurrence and chronicity of LBP. Risk factors include individual factors, psychosocial factors, and occupational and work-related factors. Up to now, none of the proposed risk factors show a strong association with LBP, which makes it difficult to develop effective treatments.

Individual risk factors

Age is one of the most common risk factors for LBP. Several studies have found that the overall prevalence of LBP increased with age until 60-65 years, after which it gradually declines. Several studies also have shown that LBP is increasingly common in adolescents, but most patients with LBP are aged 40 to 80 years.^[5;23] The Global Burden of Disease study showed that LBP is more prevalent in men (mean 10.1%) than in women (mean 8.7%).^[1] There is evidence that absenteeism and health care utilization are higher in women than in men, and that women are more at risk for developing chronic LBP. Physical fitness, including core strength of back- and stomach muscles have been shown to have a positive association with LBP, while smoking seems to be a risk factor.^[24] Poor general health, radiculopathy, and limited functioning are individual risk factors for chronic LBP.^[24]

Psychosocial risk factors

A variety of psychosocial factors have been shown to be associated with LBP, although the direction of the association is not always clear.^[23] A number of psychological and cognitive risk factors have been proposed to be associated with the onset of LBP, and particularly with the transition from acute to chronic LBP. These include stress, anxiety, depression, and certain pain behavior traits; in clinical guidelines referred to as yellow flags.^[23] Pain behavior traits include somatization, in which patients experience psychological distress as physical symptoms, and behave and seek medical help accordingly.^[23;25] Other traits include fear avoidance beliefs, where patients avoid movement and activity out of fear for pain.^[23;26] A well-documented factor is the presence of negative back beliefs, defined as general assumptions about the inevitable future consequences (such as treatment outcomes, progression, and extent of

disability) of having LBP.^[27] Negative back beliefs have been found to be associated with persistent high intensity LBP, and are associated with prolonged sick-leave absence.^[28-29] Low socioeconomic status has been associated with an increased prevalence, longer duration, and poor outcomes in LBP.^[23] There seems to be an inverse relationship between socioeconomic status and LBP occurrence.

Occupational and work-related factors

Several workplace risk factors for the occurrence of LBP have been identified. Self-reported physical job demands (i.e. manual material handling, such as whole body vibrations, bending, and twisting) have been found to be associated with chronic occupational disability due to LBP.^[24,30-31] Psychosocial workplace factors also play an important role in LBP occurrence. It has been shown that, among others, job dissatisfaction, lack of social support in the workplace, and high work fear avoidance beliefs are important risk factors.^[30,21-33] Job dissatisfaction has also been shown to play a role in the transition from acute to chronic LBP.^[30]

Low back pain treatment, guidelines, and guideline implementation

There is a widespread understanding that LBP should be treated in primary care. In many countries around the world, clinical guidelines have been developed to assist professionals in aligning their care with the best evidence available. The guidelines provide recommendations for diagnosis and treatment, widely recommend multidisciplinary approaches, and are largely similar across countries. Common diagnostic recommendations for LBP include screening for serious pathology, physical examination for neurologic screening, and consideration of psychosocial factors in cases where there is no improvement.^[34] There is a variety of treatment recommendations available for (sub)acute and chronic LBP. Treatment recommendations for (sub)acute LBP include reassuring the patient, advising to continue activities of daily living including work, discouraging bed rest, and prescribing pain medication if necessary. In the chronic phase, supervised exercise therapy, cognitive behavioral therapy, and multidisciplinary treatment are commonly advised.^[34] In general it is agreed upon that 'less is more' applies to patients with LBP, and that diagnostic imaging and specialist consultations can even be harmful to patients through patient labeling, irradiation exposure, and unnecessary surgery.^[35]

Many guidelines also recommend self-management for patients, which is a reflection of a newly proposed definition of health, i.e. "health as the ability to adapt and self-manage in the face of social, physical, and emotional challenges".^[36-37] A systematic review on the effectiveness of self-management programmes showed that these programmes are effective in improving pain intensity and disability.^[38] In Australia, a self-management education mass media campaign proved to be effective on reducing healthcare consumption due to LBP and in improving beliefs about back pain (i.e. that bed rest is not necessary and it is best to continue activities of daily living through back pain).^[39] Therefore, effective strategies to

promote self-management and thereby also reduce healthcare consumption are needed to reduce the burden of LBP.

Usually, guidelines are passively disseminated among practitioners, sometimes supplemented with letters or booklets for patients.^[34] However, previous research has shown that passive approaches for guideline implementation are generally ineffective.^[40-41] Ineffective guideline dissemination leads to a knowledge gap where physicians are not informed of the existence and content of (new) guidelines. Besides the knowledge gap, patient-related factors such as patient demands and patient dissatisfaction with guideline-concordant treatment play a role in physicians' guideline adherence.^[42] Professionals might be reluctant to jeopardize the relationship with their patients and are therefore inclined to acquiesce with patients' wishes for non-compliant treatment.^[43] Given that a variety of healthcare professionals can be involved in cases of LBP patients, it is necessary that these professionals provide unambiguous advice to the patient. Therefore, multidisciplinary communication and collaboration are important. Although multidisciplinary collaboration is efficient, reduces absenteeism, and improves the quality of care and wellbeing of the patient, collaboration remains poor.^[44] Reasons for poor collaboration include trust issues, unfamiliarity between the professionals, and practical barriers.^[44] Given that barriers for guideline adherence exist on various levels, effective implementation of guidelines necessitates that all barriers be targeted simultaneously; i.e. a multifaceted approach to implementation. The development of effective implementation strategies for LBP guidelines remains a challenging task.

Low back pain in the Netherlands

In the Netherlands, the year prevalence of neck and back pain in 2016 was approximately 2 million people, of whom 58% were female. The incidence of LBP was 577.600 in 2016, of whom 55% were female.^[45] These numbers are plausibly an understatement of actual number of cases, because some people with LBP will not make use of (regular) health care facilities. In 2015, 40% of patient visits with physiotherapists were regarding LBP or neck pain, amounting to a year prevalence of 1.6 million back and neck pain patients in the physiotherapists' office.^[45] An estimated 16% of all registered sick leave days are due to LBP, and 14% of disability benefits are due to LBP.^[46-47] In primary care, general practitioners and physiotherapists are the most commonly visited healthcare providers for LBP.^[48] Over 90% of patients with LBP contact their general practitioner at least once per year, and one third of these patients are referred to a medical specialist.^[48-49] Sixty percent of these referrals were to neurology, 29% to orthopedics, and 11% to neurosurgery.^[49]

To improve care for people with LBP in the Netherlands, and to reduce the economic burden, in 2010 a multidisciplinary guideline for LBP was developed.^[50] This guideline recommends multidisciplinary collaboration and communication between health care providers in primary

care and between health care providers and patients, and emphasizes the importance of physical activity and return-to-work of LBP patients. Another important aspect of the guideline is the focus on psychosocial risk factors in patients and appropriate treatment regimens.

Aim of this thesis

The main objective of this thesis is to evaluate the effectiveness and cost-effectiveness of a multifaceted strategy to implement the Dutch guideline for LBP in primary care, and thereby improving back beliefs of patients with LBP, and reducing the amount of referrals to secondary care and diagnostic imaging for these patients. Specifically, the following objectives will be addressed in this thesis:

1. To develop a multifaceted strategy to implement the Dutch guideline in primary care including:
 - A multidisciplinary educational training for healthcare professionals;
 - An informative website for patients with LBP to increase their knowledge, and improve back beliefs and self-management.
2. To evaluate the effectiveness and cost-effectiveness of implementation of the Dutch multidisciplinary guideline for LBP through a multifaceted strategy compared with usual implementation on back beliefs, functional status, quality of life and absenteeism of patients with LBP.
3. To evaluate the effectiveness and cost-effectiveness of implementation of the multidisciplinary guideline for LBP through a multifaceted strategy compared with usual implementation on adherence of general practitioners to the guideline.
4. To evaluate the barriers and facilitators of successful implementation of the multidisciplinary guideline for LBP through a multifaceted strategy from the perspective of general practitioners, physiotherapists, occupational physicians, and patients with LBP.

To reach these objectives, a longitudinal stepped-wedge cluster randomized trial was carried out and evaluated, along with qualitative and quantitative process evaluations to study barriers and facilitators for implementation, a systematic review to study the effectiveness of multifaceted implementation strategies for LBP, and an evaluation of a Canadian mass media campaign to improve beliefs about LBP among the general public.

Outline of this thesis

The objectives of this thesis will be addressed according to the following outline.

Chapter 2 describes the results of a long-term evaluation of a Canadian mass media campaign to improve back beliefs of the general public.

Chapter 3 examines the associations between socio-economic status, back beliefs, and exposure to a campaign aimed at improving back beliefs.

Chapter 4 presents a systematic review that evaluated the effectiveness of multifaceted strategies to implement guidelines for LBP and neck pain.

Chapter 5 provides a detailed description of the design of the longitudinal stepped-wedge cluster randomized trial.

Chapter 6 describes barriers and facilitators for implementation of the multidisciplinary guideline from the professionals' perspective.

Chapter 7 describes barriers and facilitators for implementation of the multidisciplinary guideline from the patients' perspective.

Chapter 8 presents the effectiveness of the multifaceted strategy on general practitioners' guideline adherence.

Chapter 9 presents the effectiveness and cost-effectiveness of the multifaceted strategy on patients' back beliefs, functional status, quality of life, and absenteeism.

Chapter 10 closes this thesis with a general discussion of the main findings and implications.

Chapter 11 provides a summary of this thesis in English.

Chapter 12 provides a summary of this thesis in Dutch (Nederlandse samenvatting).

REFERENCES

1. 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. *Annals of the Rheumatic Diseases* 2014;73:968-974.
2. Stanton TR, Latimer J, Maher CG, Hancock M. Definitions of recurrence of an episode of low back pain: a systematic review. *Spine* 2009;34:E316-22.
3. Henschke N, Maher CG, Refshauge KM, Herbert RD, Cumming RG, Bleasel J, et al. Prognosis in patients with recent onset low back pain in Australian primary care: inception cohort study. *BMJ* 2008;337:a171.
4. Rubin DI. Epidemiology and risk factors for spine pain. *Neurol Clin* 2007;25(2):353-71.
5. Hoy D, Bain C, Williams G, March L, Brooks P, Blyth F, et al. A systematic review of the global prevalence of low back pain. *Arthritis Rheum* 2012;64(6):2028-37.
6. United Nations Department of Economic and Social Affairs; Population Division. *World Population Ageing Report (ST/ESA/SER.A/390)*. New York: United Nations; 2015.
7. Vos T, Flaxman AD, Naghavi M, Lozano R, Michaud C, Ezzati M, et al. Years lived with disability (YLDs) for 1160 sequelae of 289 diseases and injuries 1990-2010: a systematic analysis for the Global Burden of Disease Study 2010. *Lancet* 2012;380(9859):2163-96.
8. Froud R, Patterson S, Eldrige S, Seale C, Pincus T, Rajendran D, et al. A systematic review and meta-synthesis of the impact of low back pain on people's lives. *BMC Musculoskeletal Disorders* 2014;15:50.
9. Burton AK, Balagué F, Cardon G, Eriksen HR, Henrotin Y, Lahad A, et al. COST B13 Working Group on Guidelines for Prevention in Low Back Pain. Chapter 2. European guidelines for prevention in low back pain. *Eur Spine J* 2006;15(2):S136-68.
10. Deyo RA, Rainville J, Kent DL. What can de history and physical examination tell us about low back pain? *JAMA* 1992;268:760-5.
11. Itz CJ, Geurts JW, Van Kleef M, Nelemans P. Clinical course of non-specific low back pain: a systematic review of prospective cohort studies set in primary care. *Eur J Pain* 2013;17(1):5-15.
12. Meucci RD, Fassa AG, Faria NMX. Prevalence of chronic low back pain: systematic review. *Rev Saude Publica* 2015;49(1);doi:10.1590/S0034-8910.2015049005874.
13. Airaksinen O, Brox, Cedraschi C, Hildebrandt J, Klaber-Moffett J, Kovacs F, et al. COST B13 Working Group on Guidelines for Chronic Low Back Pain. Chapter 4. European guidelines for the management of chronic nonspecific low back pain. *Eur Spine J* 2006;15(2):S192-S300.
14. Williams JS, Ng N, Peltzer K, Yawson A, Biritwum R, Maximova T, et al. Risk Factors and Disability Associated with Low Back Pain in Older Adults in Low- and Middle-Income Countries. Results from the WHO Study on Global AGEing and Adult Health (SAGE). *PLoS One* 2015;10(6):e0127880.
15. Görgе M, Ziehm J, Farin E. Health-care utilization of patients with chronic back pain before and after rehabilitation. *BMC Health Serv Res* 2017;17:812;doi:10.1186/s12913-017-2757-3.
16. Stewart WF, Yan X, Boscarino JA, Maeng DD, Mardekian J, Sanchez J, et al. Patterns of health care utilization for low back pain. *J Pain Res* 2015;8:523-535.

17. Dagenais S, Caro J, Haldeman S. A systematic review of low back pain cost of illness studies in the United States and internationally. *The Spine Journal* 2008;8(1):8-20.
18. Luo X, Pietrobon R, Sun SX, Liu GG, Hey L. Estimates and patterns of direct health care expenditures among individuals with back pain in the United States. *Spine* 2004;29(1):79-86.
19. Walker BF, Muller R, Grant WD. Low back pain in Australian adults: the economic burden. *Asia Pac J Public Health*. 2003;15(2):79-87.
20. Maniadakis N, Gray A. The economic burden of back pain in the UK. *Pain* 2000;84:95-103.2.
21. Van Tulder MW, Koes BW, Bouter LM. A cost-of-illness study of back pain in the Netherlands. *Pain* 1995;62:233-40
22. Lambeek LC, Van Tulder MW, Swinkels IC, Koppes LL, Anema JR, van Mechelen W. The trend in total cost of back pain in The Netherlands in the period 2002 to 2007. *Spine* 2011;36(13):1050-8.
23. Hoy D, Brooks P, Blyth F, Buchbinder R. The epidemiology of low back pain. *Best Practice & Research Clinical Rheumatology* 2010;24(6):769-781.
24. Van Tulder MW, Koes B. Evidence-based handelen bij lage rugpijn. Houten: Bohn, Stafleu, Van Loghum; 2013.
25. Lipowski ZJ. Somatization: the concept and its clinical application. *Am J Psychiatry* 1988;145(11):1358-68.
26. Zale EL, Lange KL, Fields SA, Ditre JW. The relation between pain-related fear and disability: a meta-analysis. *J Pain* 2013;14(10):1019-30.
27. Symonds TL, Burton AK, Tilotson KM, Main CJ. Do attitudes and beliefs influence work loss due to low back trouble? *Occupational Medicine* 1996;46:25-32.
28. Ng SK, Cicuttini FM, Wang Y, Fitzgibbon B, Urquhart DM. Negative beliefs about low back pain are associated with persistent high intensity low back pain. *Psychol Health Med* 2017;22(70):790-799.
29. Urquhart DM, Kelsall HL, Hoe VC, Cicuttini FM, Forbes AB, Sim MR. Are psychosocial factors associated with low back pain and work absence for low back pain in an occupational cohort? *Clin J pain* 2013(29):1015-1020.
30. Chou R, Shekelle P. Will this patient develop persistent disabling low back pain? *Journal of the American Medical Association* 2010;303(13):1295-1302.
31. Du Bois M, Szpalski M, Donceel P. Patients at risk for long-term sick leave because of low back pain. *The Spine Journal* 2009;9(5):350-359.
32. Macfarlane GJ, Pallewatte N, Paudyal P, Blyth FM, Coggon D, Crombez G, et al. Evaluation of work-related psychosocial factors and regional musculoskeletal pain: results from a EULAR Task Force. *Annals of the Rheumatic Diseases* 2009;68(6):885-891.
33. Turner JA, Franklin G, Fulton-Kehoe D, Sheppard L, Wickizer TM, Wu R, et al. Worker recovery expectations and fear-avoidance predict work disability in a population-based workers' compensation back pain sample. *Spine* 2006;31(6):682-689.
34. Koes BW, Van Tulder MW, Lin CWC, 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):2075-2094.
35. Srinivas SV, Deyo RA, Berger ZD. Application of "Less is More" to low back pain. *Arch Intern Med* 2012;172(13):1016-1020.
36. Wong JJ, Cote P, Sutton DA, Randhawa K, Yu H, Varatharajan S, et al. Clinical practice guidelines for the noninvasive management of low back pain: A systematic review by the Ontario Protocol for Traffic Injury Management (OPTIMA) Collaboration. *Eur J Pain* 2016;21:201-216.

37. Huber MAS, Van Vliet M, Giezenberg M, Knottnerus JA. 2013. Towards a conceptual framework relating to 'Health as the ability to adapt and to self manage', Operationalisering gezondheidsconcept. Driebergen: Louis Bolk instituut; 2013.
38. Du S, Hu L, Dong J, Xu G, Chen X, Jin S, Zhang H, Yin H. Self-management program for chronic low back pain: A systematic review and meta-analysis. *Patient Education and Counseling* 2017;100(1):37-49.
39. Buchbinder R, Jolley D, Wyatt M. 2001 Volvo Award Winner in 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.
40. Grimshaw JM, Thomas RE, MacLennan G, Fraser C, Ramsay CR, Vale L, et al. Effectiveness and efficiency of guideline dissemination and implementation strategies. *Health Technol Assess* 2004;8:iii-72.
41. Grimshaw JM, Shirran L, Thomas R, Mowatt G, Fraser C, Bero L, et al. Changing provider behavior: an overview of systematic reviews of interventions. *Med Care* 2001;39:112-45;doi:10.1097/00005650-200108002-00002.
42. Fullen BM, Baxter GD, O'Donovan BGG, Doody C, Daly LE, Hurley DA. Factors impacting on doctors' management of acute low back pain: a systematic review. *European Journal of Pain* 2009;13:908-914.
43. Baker R, Camosso-Stefinovic J, Gillies C, Shaw EJ, Cheater F, Flottorp S, et al. Tailored interventions to overcome identified barriers to change: effects on professional practice and health care outcomes. *Cochrane Database Syst Rev* 2010;17(3):CD005470;doi: 10.1002/14651858.CD005470.pub2.
44. Nauta, AP 'Een vertrouwenskwestie?' Over het samenwerken van huisartsen en bedrijfsartsen. Heerlen: Open University; 2004.
45. Volkgezondheid en Zorg. Nek- en rugklachten. Accessed 23-01-2018 through <https://www.volksgezondheinzorg.info/onderwerp/nek-en-rugklachten>.
46. Van der Molen H, Spreeuwens D, Kuijper P, Nieuwenhuijsen K, Bakker J, Pal T, et al. Beroepsziekten in cijfers 2009. Amsterdam: Nederlands Centrum voor Beroepsziekten, Coronel Instituut voor Arbeid en Gezondheid, Academisch Medisch Centrum, Universiteit van Amsterdam; 2009.
47. Picavet HSJ. Aspecifieke lage rugklachten: omvang en gevolgen. Factsheet Centrum voor Preventie- en Zorgonderzoek (PZO), Bilthoven: Rijksinstituut voor Volksgezondheid en Milieu; 2005.
48. Nederlands instituut voor onderzoek van de gezondheidszorg (NIVEL). Zorgregistraties eerste lijn, aandoeningen uitgelicht: Rugpijn. Accessed 23-01-2018 through <https://www.nivel.nl/nl/NZR/aandoeningen-rugpijn>.
49. Theus R, Zaat JOM, Uijen A, Enzing JJ. Rugpijn: patiënten versus onderzoek. *Ned Tijdschr Geneesk* 2014;158:A7456.
50. Van Tulder MW, Custers JW, De Bie RA, Hammelburg R, Hulshof CTJ, Kolnaar BGM, et al. Keten Zorgrichtlijn aspecifieke lage rugklachten. The Netherlands: KKCZ; 2010.