# Chapter 1

# General introduction

In industrial societies the impact of musculoskeletal disorders is both serious and extensive. Together, the various musculoskeletal disorders form the largest cause of limitations of activity,[13] albeit the disorders are rarely life threatening. The low mortality associated with these disorders is probably the reason why research in this field is very limited, compared with cardiovascular diseases and neoplasms. Musculoskeletal disorders affect relatively young persons, resulting in severe economic consequences. Low back pain has been called the 'single most expensive disease in society' (personal communication M. Nordin).

Although musculoskeletal disorders are a group of diseases with seemingly great variation, many aspects of the various disorders are similar. For example: spontaneous healing of small traumatic lesions of collagenous tissue occurs within approximately 3-6 weeks, irrespective of the anatomical location of the lesion. Several well-known musculoskeletal disorders have a healing time ranging from several months to two years: e.g. tennis elbow, golfer's elbow, frozen shoulder and plantar fasciitis. Although these lesions have not been fully characterized, their course is strikingly identical in the majority of cases. The onset is gradual, maximum severity is reached after weeks to months and, after a steady state period, the complaints gradually subside. In every disorder of the musculoskeletal system, however, complaints may continue beyond the healing time; in these cases, psychosocial factors may play a more dominating role. The risk of complaints persisting beyond the healing time seems to increase in case of: uncertainty about both diagnosis and prognosis, fear of (re)injury, lack of understanding about the patients condition, physical and mental exhaustion, etc.[12]

The largest component of all musculoskeletal disorders is formed by low back pain. After 1934, when hernia nucleus pulposus was described, for many decades it was believed that the cause of all kinds of low back pain had been found.[6] In the 1960s, after the impressive work of Nachemson on intradiscal pressure, it was thought that non-specific low back pain could be treated and prevented by correct sitting, lifting and bending.[7] By the 1990s, however, it had become clear that the value of 'back schools' was limited.[5]

In 1996 it was reported that in only 5-10% of general practice patients with low back pain a specific structural cause could be found;[4] this implies that only this small group could receive treatment directed to the specific cause. For the remaining 90-95% the

cause of the disease remains unclear and it is only possible to treat the symptoms and the psychosocial effects.

In 1990, members of the Research Group Musculoskeletal System of the Erasmus University Rotterdam noted six facts:
1. In 96-99% of the cases lumbar radicular syndromes caused by herniation of the nucleus pulposus are localized at L4-L5 or L5-S1.[4] Clinical experience indicates that non-specific low back pain is also generated at these levels.
2. The vertebrae L4 and L5 are connected to the pelvis by iliolumbar ligaments.[14]
3. Pregnancy is a risk factor to get non-specific low back pain;[1,11] no other known factor has a higher risk.
4. The classic idea that low back pain during pregnancy is caused by increase of lordosis of the lumbar spine, was not supported by scientific investigations; the spine during pregnancy is even straighter than after childbirth.[8,9]
5. During pregnancy, mobility of the pelvic ring increases.[2,3]
6. Low back pain during pregnancy can be beneficially influenced by means of a belt fastened around the pelvis.[8]

Reviewing and combining these observations led to the idea that lack of stability of the base of the spine, i.e. the pelvis, contributes to the incidence of non-specific low back pain. Lack of stability of the pelvic girdle has also been described as a failed load transfer through the pelvic girdle.[10] It was concluded that study of low back pain could best be performed in subjects who experienced back pain for the first time during pregnancy or during the first 3 weeks after pregnancy (peripartum pelvic pain, PPPP). This is the main focus of the present thesis. A study was designed based on the epidemiology, etiology, diagnosis and treatment of PPPP. The research was divided into different projects which are described in Chapters 2 to 7.

Chapter 2 presents a cross-sectional study on 394 patients with PPPP. The aim of the study was to gain a global impression about the kind of complaints encountered in PPPP, their impact, and their course over time.

Chapter 3 describes a randomized clinical trial. Patients with PPPP were randomized to be treated with 1) exercises to strengthen the diagonal trunk muscle systems, 2) training of the longitudinal trunk muscle systems, or 3) the instruction to refrain from exercises. The purpose of the study was to evaluate the hypothesis that training of the diagonal trunk muscle systems is of benefit in PPPP.

The aim of the studies presented in chapters 4 to 7 was to develop clinical tests to quantify and qualify PPPP.

In Chapter 4 the validity and reliability of the Active Straight Leg Raise Test (ASLR test) in PPPP was investigated. Reliability, sensitivity and specificity were assessed and the validity of the use of the test as a disease severity scale was determined.

In Chapter 5 the relation between the ASLR test and mobility of the pelvic joints was studied. The aim was to investigate and characterize the nature of the ASLR test. The study was performed on 21 patients with PPPP in whom pain and impairment of ASLR were mainly localized at one side. In each patient the mobility of the sacro-iliac joint at the painful side (measured radiographically) was compared with the mobility of the sacro-iliac joint at the other side. Moreover, the influence of a pelvic belt on the ASLR test was investigated.

Chapter 6 presents a study on the usefulness of the abduction and adduction strength of the hips as instruments to diagnose PPPP. Test-retest reliability, inter-tester reliability, sensitivity and specificity were assessed and the validity of the use of the measurements as a disease severity scale was determined.

Finally, Chapter 7 addresses the usefulness of various severity scales to measure changes of severity in PPPP. The aim was to develop a small battery of simple tools to evaluate the course of PPPP.

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