

The Rehabilitation Process for Individuals with Musculoskeletal and Mental Disorders

**- Evaluation of Health, Functioning,
Work Ability and Return to Work**



Charlotte Wählin

Division of Physiotherapy
Department of Medical and Health Sciences
Linköping University, Sweden



Linköping University
FACULTY OF HEALTH SCIENCES

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Charlotte.wahlin@liu.se

<http://www.imh.liu.se>

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*To my mother Mona
To Claes, Kajsa and Oscar*

*"Skäms inte för att du är människa, var stolt!
Inne i dig öppnar sig valv bakom valv oändligt.
Du blir aldrig färdig, och det är som det skall"*

Ur dikten Romanska bågar av Thomas Tranströmmer

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ABSTRACT

The Rehabilitation Process for Individuals with Musculoskeletal and Mental Disorders - Evaluation of Health, Functioning, Work Ability and Return to Work

Musculoskeletal disorders (MSD) and mental disorders (MD) are common among working-age individuals, and reduced work ability is often a problem that influences functioning in working life. Having MSD and MD is also a common cause of seeking health care and these conditions account for the majority of sick leave in most western countries. The rehabilitation process for working-age individuals with MSD and MD seeking health care can be seen as a collaborative course of actions aiming to optimize work participation.

The overall aims of the thesis were to increase knowledge about biopsychosocial assessment of health, functioning and work ability for individuals with MSD and MD seeking care. A further aim was to gain better understanding of praxis behaviour in the rehabilitation process for sick-listed patients by evaluating patient-reported work ability, type of interventions given, usefulness of interventions, and return to work.

This thesis comprises four studies based on two different cohorts. A cross-sectional design was used for studies I and II, which included 210 individuals diagnosed with MSD and MD seeking occupational health services. Data collection consisted of questionnaires to patients on self-reported health, functioning, work ability and reports of professional assessment of diagnosis, main clinical problem, recommended intervention and sick leave. Studies III ($n=699$) and IV ($n=810$) were based on a longitudinal cohort study, ReWESS, with a 3-month follow-up comprising individuals who sought primary health care or occupational health services for MSD or MD and were sick-listed. The data collection included repeated questionnaires to the patients on self-reported health, functioning, work conditions, expectations, work ability, type of interventions given, usefulness of interventions and self-reported return to work.

There was an association between the professional biopsychosocial assessment and patients' self-reported measures of health, functioning and work ability in clinical reasoning. Self-reported health and work measures can complement the expert-based diagnosis. Patients who had MSD and MD with co-morbid conditions reported more problems with mental functioning, had higher psychological demands at work and reported poorer work ability compared with those with MSD only. Patients with co-

morbid conditions also had worse outcome compared to the group having mental disorders only. Psychosocial problems and activity limitations concerning social interaction skills were a frequent problem. This can be identified in clinical screening by physiotherapists in dialogue with the patient using the Patient-Specific Functional Scale.

Three-quarters of sick-listed individuals with MSD or MD returned to work within 90 days. The treatment approach to sick-listed persons is still very medical and clinically oriented. Access to work-related interventions seems to be limited in the early rehabilitation process and may not be equal in practice. Those who were younger, had higher educational level and reported stronger health resources were favoured. There is a need to strive for access to work-related interventions.

Return to work was associated with receiving combined clinical and work-related interventions for patients with MD, and with better health-related quality of life, positive return to work expectations and better work ability for patients with MSD. Factors associated with return to work can be identified using self-reported measures. Patients with MD who received a combination of work-related and clinical interventions perceived best usefulness and best effect of health care contacts on work ability. Patients with MSD did not report as good usefulness. There seems to be a gap between scientific evidence and praxis behaviour in the early rehabilitation process; unimodal rehabilitation was widely applied, use of a multimodal treatment approach was limited and only one-third received work-related interventions. According to the biopsychosocial model, patient-reported interaction among medical, psychosocial, ergonomic and system-based factors seems to be lacking in the rehabilitation process. For patients with MSD, behavioural treatment seems to be underutilized in clinical practice considering the effect it may have on developing coping strategies and reducing symptoms. In order to meet recommendations in guidelines, physical activity needs to increase as a treatment strategy for patients with MD.

A clinical implication is that the rehabilitation process needs to adopt a broader perspective for patients with MSD and MD to include patients' individual health-related needs, aspects of employment and work conditions. Still, it remains a challenge to understand who needs what type of intervention.

Keywords: Musculoskeletal disorders; Mental disorders; Rehabilitation process; Professional assessment; ICD-10; Sick leave; Biopsychosocial; Self-report; Work ability, Interventions; Usefulness; Return to work; Sweden

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LIST OF PAPERS

This thesis is based on the following papers, which are referred to in the text with Roman numerals (I–IV)

- I **Charlotte Wåhlin Norgren**, Kerstin Ekberg, Birgitta Öberg. “Is an expert diagnosis enough for assessment of sick leave for employees with musculoskeletal and mental disorders?” *Disability and Rehabilitation* 2011; 33:1147–1156.
- II **Charlotte Wåhlin**, Kerstin Ekberg, Birgitta Öberg. “Clinical reasoning in occupational health services for individuals with musculoskeletal and mental disorders”. *Submitted*.
- III **Charlotte Wåhlin**, Kerstin Ekberg, Jan Persson, Lars Bernfort, Birgitta Öberg. “Association between clinical and work-related interventions and return to work for patients with musculoskeletal or mental disorders”. *Journal of Rehabilitation Medicine* 2012; 44:355-362.
- IV **Charlotte Wåhlin**, Kerstin Ekberg, Jan Persson, Lars Bernfort, Birgitta Öberg. “Evaluation of self-reported work ability and usefulness of interventions among sick-listed patients”. *Submitted*.

LIST OF ABBREVIATIONS

ANOVA	Analysis of variance
ANCOVA	Analysis of covariance
AVSI	Availability of social integration
CI	Confidence interval
EQ-5D	European Quality of Life 5 Dimensions Questionnaire
EQ-VAS	European Quality of Life-visual analogue scale
ERI	Effort–Reward Imbalance
FRI	Functional Rating Index
ICD-10	International Statistical Classification of Diseases and Related Health Problems, 10th Revision
ICF	International Classification of Functioning, Disability and Health
MSD	Musculoskeletal disorders
MSPQ	Modified Somatic Perception Questionnaire
MD	Mental disorders
n.s.	Non-significant
OC	Overcommitment
OR	Odds ratio
PSFS	Patient-Specific Functional Scale
RTW	Return to work
ReWESS	Return to Work East Sweden Study
SD	Standard deviation
SES	Self-Efficacy Scale
SMBQ	Shirom Melamed Burnout Questionnaire
ZSDS	Zung Self-Rating Depression scale
WAI	Work Ability Index

DEFINITIONS

Rehabilitation	Measures required for coping with the functional consequences of a disease, defect or trauma (1). Should be directed to overcome biopsychosocial obstacles to recovery and return to work (2).
Rehabilitation process	The process of sick listing and rehabilitation can be described as a continuum of ongoing intentions, actions, and relations between (and within) the individuals affected, i.e. sick-listed persons, relatives, employers, and those working within the health services and the social insurance (3).
Clinical reasoning	The process in which the clinician, interacting with significant others (patient, caregivers, health care team members), structures meaning, goals and health-management strategies based on clinical data, client choices, and professional judgement and knowledge (4).
Health	Includes dimension of physical, mental, emotional, and social well-being. According to holistic theory of health, can be described as: “A is completely healthy if, and only if, A has the ability, given standard circumstances, to reach all his or her vital goals” (5).
Functioning	According to International Classification of Functioning, Disability and Health (ICF), the term functioning encompasses body functions, activities and participation from a health perspective (6).
Work ability	Human resources related to physical, mental and social demands of work, work community and management, organizational culture, and work environment (7).
Return to work	Return to work is used as an outcome measure evaluating returning to work in the rehabilitation process (8, 9).

BACKGROUND

Paid work seems to have a positive impact on health and well-being for individuals of working age. However, individuals with health-related disabilities may have difficulties functioning in their working life, and new employment opportunities are limited in many cases (10). The ability to perform work tasks and functioning at the workplace is related to health, to physical and psychological capacity, to social ability, thinking and problem-solving skills, as well as education, competence, personal goals and opportunities to adjust work to health (7, 11–13). Among individuals with musculoskeletal disorders (MSD) and mental disorders (MD), poor work ability and reduced functional capacity are frequent problems causing work disability (14–17).

Disability is mostly seen as a biopsychosocial phenomenon, which implies inability for a person with a physical and/or mental condition or impairment to perform usual activities and who has restrictions in participating in daily tasks and work situations. Work disability includes time off work as well as ongoing work limitations (2, 6, 9). Previous research has linked reduced work ability to poor general health, poor mental and physical health, reduced musculoskeletal capacity, increasing age, poor work posture, high physical work load, poor physical work environment, as well as long working hours, unskilled work, and psychosocial factors at work (18–22). Studies have also shown an association between poor work ability and sick leave (22, 23).

MSD and MD are the leading causes of sick leave in Sweden and in other western countries, and require a high level of health care services (24–28). Even though the pattern of sickness absence has changed and decreased in the last decade (29), the rate is still high. In Sweden, the Social Insurance Agency reported that approximately 470,000 individuals received sickness cash benefit at some time during 2010. This corresponds to about 8% of all registered insured individuals aged between 16 and 64 years (30). Among individuals with MSD, low back pain was found to be one of the most common diagnoses, and sick leave due to MSD was found to be more frequent among those with a lower level of education and among blue-collar workers compared with white-collar workers. Among individuals with MD, depression, adjustment disorders and reactions to severe stress are common diagnoses causing sick leave. In the group with MD, the most frequent occupation was professionals taking care of other people (28), in line with previous research from Denmark (31). The cost of sickness absence is problematic in many western countries, but it is difficult to

compare due to differences in the social insurance systems. In 2010, the total cost for social insurance in Sweden was almost SEK 211 billion, and about SEK 122 billion went to the sick and disabled (30). In England, approximately 175 million working days were lost due to sickness absence in 2006 (32). The cited author concluded that the overall sick leave was 4.2% among the Dutch working population, and one-third of those were related to the musculoskeletal system (33). Sickness absence incurs other costs in society such as productivity loss for the workplace, health care costs and there are also many negative health and work consequences for the individual on sick leave (34–36).

Sick leave due to MD has markedly increased in the last few years and is now the most common cause of sick leave among those on long-term sick leave (27%). MSD is the second leading cause and accounts for 26% of all long-term sick leave (37). Long-term sickness absence is defined as more than 60 days of sickness absence according to the Swedish Social Insurance Agency. However, in the research literature there is no clear definition of long-term sickness absence; varied length of absence is used to describe long-term sickness: 1 month (27, 32, 38), 6 weeks (39), 2 months (25, 29) or 3 months (24, 40). The risk of receiving a disability pension is increased for patients with MD (41). The increased risk of sickness absence due to MD is reported in other western countries (39), and is found to be increased for those who have psychological problems, experience psychosomatic complaints, experience burnout and have strenuous working conditions (42). The risk of recurrent sickness absence was found to be increased in a cohort of 10,000 Dutch employees with a previous episode of sickness absence due to common MD (39).

Causes of sick leave are multifactorial and are found to be related to the workplace, life outside work, personal well-being and individual factors (26, 43–48). Dawson et al. (49) explored factors associated with sickness absence among 2164 nurses with low back pain in the preceding year. They found that higher severity and worse pain, frequent manual handling at work, passive coping behaviour and fear of movement were associated with sickness absence. Being female was also found to increase the probability of being sick-listed compared with male (26, 29, 50–52). Laaksonen et al. (51) found that the risk for women was especially increased for shorter sickness absence and causes of longer sickness absence were found to be related to heavier burden of ill health. Although Lidwall et al. (29) showed that long-term sickness absence also was associated with female sex. The gender differences can partly be explained by factors relating to prerequisites at work and the type of employment, to sociocultural factors, as well as biological differences (29, 50–52), although the evidence is not clear and varies between countries and age groups. There is increased interest among researchers and health care professionals in learning from patients'

experiences of the rehabilitation process in order to improve the quality of health care, rehabilitation services and interventions aimed at enhancing return to work (53–56), and patient-reported outcome measures deserve more attention. Studying the rehabilitation process is also of interest from a societal perspective because a government goal is to increase labour market participation for working-age individuals in Sweden. However, the type of health care interventions that are actually offered in the early rehabilitation process and patient-reported judgement of usefulness still remain to be studied.

The rehabilitation process

Rehabilitation can be described as the measures required for coping with the functional consequences of a disease, defect or trauma (1), and should be directed to overcome biopsychosocial obstacles to recovery and return to work (2). A description of the sick listing and rehabilitation process has been presented by Hensing (3); *“The process of sick listing and rehabilitation can also be described as a continuum of ongoing intentions, actions, and relations between (and within) the individuals affected, i.e. sick-listed persons, relatives, employers, and those working within the health services and the social insurance”*. Based on this definition and previous research literature (3, 12, 57, 58), the rehabilitation process can be viewed as an active collaborative process that promotes change performed by the care-seeking individual with work disability through support from others, tailored according to initial screening, incentives and to goals, making adjustments for successful outcome, aiming to optimize work participation. It is suggested in the research literature that return to work can be achieved by identifying and focusing on facilitators for return to work using a collaborative approach between the worker, health care professionals, the employers and the workplace, as well as the stakeholder involved in the rehabilitation process (59, 60).

The role and involvement of the stakeholder is known to vary throughout the process and can be divided into different phases. Young et al. (9) have identified four phases of returning to work including the off work, re-entering, maintenance and advancement phases for which different medical, rehabilitative and work-related interventions are useful depending on the goals and phase in the rehabilitation process. The sick-listed person is encouraged to have an active role throughout their own rehabilitation process (59, 61). However, problems exist in the rehabilitation process concerning the individuals’ ability to cope with their symptoms, poor access to

rehabilitation, lack of knowledge among sick-listed individuals about their rights and responsibilities, as well as problematic collaboration and communication between stakeholders (55, 59, 62, 63). Most of this research is based on long-term sick-listed employees. A recent Swedish study showed that the sick-listed person felt that too much responsibility was placed on them in the rehabilitation process without support from employers and social insurance officials who have the knowledge and understanding to navigate through the system (64). This is also highlighted in a review by Pomaki et al. (65), who reported that navigation through the disability management system and facilitating access to clinical treatment may improve work functioning for workers with common MD.

In the rehabilitation process, the time until returning to work after sick leave varies depending on several factors such as individual health resources, expectations, the severity of the health condition, work environment factors, the financial compensations system, degree of sick leave, delay in receiving treatment, as well as satisfaction with treatment (66–71). It is often recommended that patients should return to their usual work as soon as possible, focusing on the person's ability to work rather than the disability (72–75). Lötters et al. (76) found that pain and functional disability continues to improve in the first month after return to work among workers with MSD, but the risk for recurrence of sickness absence is increased for those with poor health and higher functional disability. De Rijk et al. (77) found that, among those with MD or MSD, women were less likely than men to have lasting return to work after the spell of sick leave.

Improvement in health, work ability and functional capacity as well as provision of a facilitating environment and employment is a common goal of rehabilitation for the person with disability (1). Outcome of return to work is a measurable characteristic of the sick-listed individual's experience or return to work status (8, 9). Several studies have explored factors associated with longer duration of sick leave (29, 45, 78–80), and found that it depends on the working conditions, health status and several individual characteristics and circumstances such as older age, poor general health, worse physical and mental functioning, high pain intensity, own prediction of not returning to work, high psychological work demands, heavy physical work, female sex, weak social support and socio-economic status. There is, however, a need for additional research to further understand the early rehabilitation process for individuals on sick leave, to evaluate the influence of work conditions and occupational category, types of diagnosis and individual health resources in relation to given interventions. The interaction and collaboration between the sick-listed individual and stakeholders in the health care system, the workplace system and the insurance system are important in the rehabilitation process (81–83).

The rehabilitation process is further presented below starting with the two main diagnoses of MSD and MD, followed by the personal system, the health care system, the workplace system and finally the insurance system.

Musculoskeletal and mental disorders

As previously described, MSD and MD are the most common causes of work disability and sick leave (24–27). The term disorders can be used for a clinically recognizable set of symptoms or behaviours. MSD and MD are umbrella terms for different conditions that include acute onset and short duration as well as long-standing disorders. It is not always possible to provide a distinct diagnosis for these conditions; at times there is only a general description of symptoms and functional limitations.

There is a difference between having an illness, disease or being sick. Illness can be seen as a more internal personal experience and is commonly based on self-reported mental or physical symptoms. Disease refers to the structure or function of the human organism that deviates from the biological norm and is diagnosed by a physician or other health care professional. Sickness or the sick role is a social status given to the ill person by society (2, 84). By using self-reported measures, groups of patients who are on sick leave can be compared with those who are not to further explore health and work patterns between patient groups. The World Health Organization's (WHO) International Statistical Classification of Diseases and Related Health Problems, 10th Revision (ICD-10) (85) is the most common basis for a medical diagnosis and is applicable in primary health care and occupational health services, and in health research (14, 39, 51, 86, 87).

Musculoskeletal disorders

According to ICD-10 (85) MSD comprises diseases of the musculoskeletal system and connective tissue (M00–M99), such as dorsopathies (M50–54), soft tissue disorders (M70–79), other joint disorders (M20–25) and injuries (S00–T98). The causes of MSD are multifactorial and may be caused by trauma, factors at work as well as factors outside work (46, 88, 89). The prevalence of MSDs is higher for women than for men (77, 78), and the incidence increases with age. Musculoskeletal pain is a major public health problem and a common cause of seeking health care. The likelihood of seeking care seems to increase with the degree of severity of pain and impaired work ability (33, 90, 91). Pain is always a subjective experience and according to the International

Association for the Study of pain it is defined as follows: “*An unpleasant sensory and emotional experience associated with actual or potential tissue damage, or described in terms of such damage*”. Pain is associated with physical, emotional and mental reactions and social components, and is considered to be a multidimensional phenomenon (2, 92–94). It is estimated that approximately 15–20% of the adult population in Europe has long-standing pain (92, 93).

The most prevalent MSDs are low back pain and neck pain (88, 89). The lifetime prevalence of spinal pain was reported in a recent review to be between 54 and 80% (93), and the lifetime prevalence for low back pain in Sweden was estimated to be 70%; the 1-year prevalence was 47% (95), although the estimated prevalence of low back pain varies between countries (93, 95, 96). Fejer et al. (97) established that there is a great variation in the prevalence of neck pain; the point prevalence varies between 6 and 22%. The annual prevalence for neck pain varies between 27 and 48% (88). In conclusion, this means that most people will at some point in their life experience an episode of low back pain or neck pain. An increased risk of recurrence relating to the degree of severity of pain, functional impact and heavier occupations has been reported (98, 99). In a cohort study including individuals with back and neck pain who were seeking primary health care, Enthoven et al. (99) found that pain and disability were associated with recurrence or with having pain continually, and increased health care consumption was associated with more disability. In follow-up studies, chronic persistent low back and neck pain was found to be a problem for 25–60% of all cases 1 year after the initial episode (93). In female municipal employees, medically certified sickness absence was predicted by sciatica and the combination of sciatica and neck pain (100). These results reflect that patients with back pain and neck pain are heterogeneous groups in which the prognosis varies depending on the severity of the health problem.

Disorders involving the back and neck are a considerable source of pain and activity limitations in workers (88, 101). Work-related MSDs are associated with high physical and psychosocial work demands, the presence of comorbidities and lifestyle variables such as being overweight and smoking (102). A review concluded that prognostic factors for occupational low back pain included severity of pain and functional limitations, radicular findings, prior episodes, personal stress, heavier work with no possibility of adjustment and low workplace support (103). Carol et al. (104) found that 60–80% of employees with neck pain reported neck pain 1 year later. Those who had limited influence on their own work situation had worse prognosis, and blue-collar workers had worse prognosis compared with white-collar workers.

Mental disorders

The ICD-10 includes detailed classification of over 300 mental and behavioural disorders (F00-F99) (85). Common diagnoses for those with MDs seeking primary health care and occupational health services are depression (F32–39), reactions to severe stress and adjustment disorders (F43), fatigue syndrome (F43.8), anxiety disorders (F41), burnout/vital exhaustion (Z73), and stress, not classified elsewhere (Z 73.3). There are several definitions of stress in the literature, and just like pain, stress is a subjective phenomenon; physical, mental and social reactions to demanding life and work situations vary between people. Being stressed can be considered as a natural psychological and biological response to threat and stressors. However, both acute and long-term stress can cause disease and sickness, physical as well as mental (105–107). According to Nieuwenhuijsen et al. (108), when distress reaches the level of clinical relevancy, it can be defined as a stress-related disorder.

A pragmatic description of stress was presented by Åsberg and colleagues in a report from the National Board of Health and Welfare in 2003 (106), in which stress can be interpreted as follows: *“the organism's reaction to the imbalance between loads which the person is exposed to and the resources the person possesses to deal with these”*. The fatigue syndrome, also known as “burnout syndrome” is a form of severe stress that became increasingly common at the start of 21st century, in particular for working-age people with occupations involving a great deal of contact with and responsibility for other people, such as teachers and health care professionals (16, 31, 109). Burnout is a debated diagnosis and there are different views on how to classify and treat the syndrome. In the Swedish version of ICD-10, both F43.8 and Z73.0 are used in clinical practice within occupational health services and primary health care.

A person's mental condition is mainly affected by three circumstances according to Stefansson (16): (1) the person's biological or bodily constitution; (2) the person's psychological ability, including cognitive aspects, the ability to understand the world around and how to handle it; (3) the person's social and material environment and how much it causes strain (high workload or a stressed living situation). The life situation for a person is determined by a combination of all these factors and is influenced by genetic factors and life conditions when growing up. A review by Stansfeld et al. (110) explored associations between psychosocial work stressors and mental ill health and found that common MD was associated with high psychological demands, job strain, effort–reward imbalance, low decision latitude, low social support, and high job insecurity. A problem for many individuals with stress-related MDs that lead to becoming sick-listed is the long-term exposure to stress with lack of recovery time, often causing disturbed sleep, mental and physical symptoms as well as cognitive limitations (106). Grossi et al. (111) compared participants who had high scores on the

Shirom Melamed Burnout Questionnaire with those who had low scores. They found that participants with a higher degree of self-reported burnout reported less control, poorer social support at work, more emotional distress and poorer quality of sleep.

About 20–40% of the Swedish population suffers from mental ill health, everything from mild MD to more serious disease states (16). In a random sample of inhabitants from six European countries, the results showed that 14% reported a lifetime history of any mood disorder (112). Furthermore, it is estimated that a quarter of the adult population in the European Union (82.7 million) is or has been affected by at least one mental disorder in the past year (113). Depression is a significant cause of work disability and functional disability (17, 67, 114). In a European study based on 1780 individuals with depression, Veronese et al. (17) found that being a woman, having low income and educational level, being of older age, being single, and having comorbidity with other medical diseases were associated with the status of not working. Pain and depression are common comorbidities and the combination of these conditions are costlier and more disabling than either condition alone (114). The consequences on functioning, work ability and daily activities is not fully understood. A review by Baire et al. (114) estimated that the prevalence of pain in patients with depression varies from 15 to 100%, whereas the prevalence of depression in primary health care patients with pain varies from 6 to 46%. Since comorbidity is common, it is important to analyse the relationship between depression and functioning in persons with pain.

The personal system

The personal system involves individual characteristics including social, affective, cognitive, and physical aspects of the worker with disabilities. According to the biopsychosocial model, assessment of the individuals' health and rehabilitation potential involves measures at the social, psychological and biological levels (81, 94). The biopsychosocial model is widely accepted and may be used as an approach for assessment in clinical practice, applicable to disabilities related to MSD and MD (figure 1). The model has mainly been used to describe pain phenomena (94, 115, 116), but is also valuable for understanding the complex biopsychosocial constructs of mental health problems as used by Cornelius et al. (79) who applied the ICF model and categorized prognostic factors for explaining long-term disability due to MD into groups of health-related, personal and external factors.

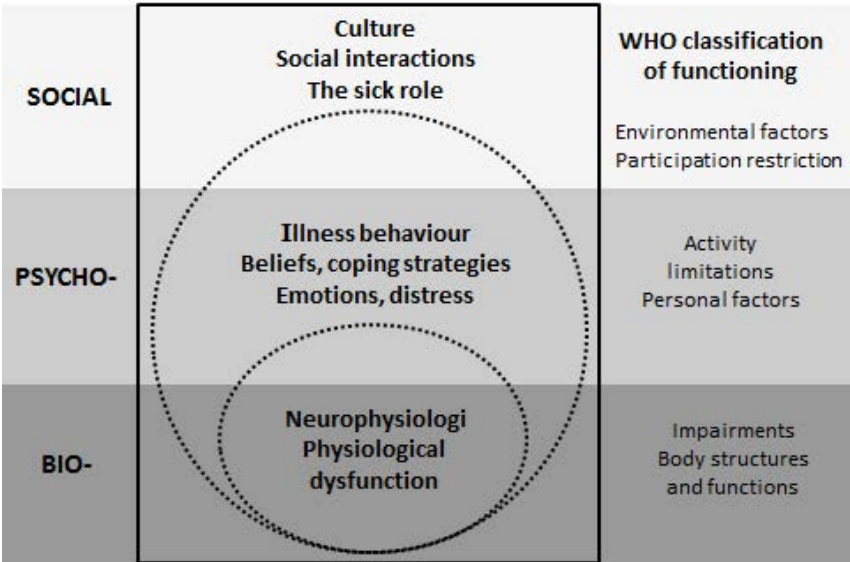


Figure 1. The biopsychosocial model of disability with components of the ICF adapted from work by Waddell and Burton (94). Published with permission from Burton.

Biopsychosocial assessment

From a health care perspective, clinical reasoning should be performed in a collaborative process between the patient and the health care professional based on a biopsychosocial approach, including clinical data, patient preferences and goals, and professional assessment and knowledge (4, 117–119). The clinical reasoning begins with obtaining data and observations of the individual who is seeking care. The patients’ health-related, work-related and social needs are identified via the assessment. In clinical reasoning, present health status and symptoms, external factors such as work demands and the patient’s own attitudes and expectations are important for choice of treatment (120–122).

The health status of a person can be measured by health care professionals and by using self-reported outcome measures. The use of questionnaires emphasizes the patients’ perspective and puts into focus how they perceive their present condition (123). Previous research shows that measurements evaluating work ability (11, 13) and

return to work (8) are diverse and there is a need to establish standardized measurements for different patient groups. Guidelines for management of MSD (72, 124) and MD (107, 125) recommend different self-reported health and work measures using both professional judgement and the patients' self-reports.

One way to choose interventions is to determine patients' preferences for interventions and obstacles to recovery, because preferences influence the outcome (126–129). Identification of barriers is also suggested for management of patients with MD seeking primary health care (130). Inclusion of psychosocial and workplace variables is encouraged in early patient screening by the clinician (122, 131, 132), and should be discussed with the patient in clinical reasoning (118, 119, 122). Screening for psychosocial risk factors (yellow flags) is also recommended in most guidelines (32, 72, 124, 133). Previous research implies that subgroup classification can be used to predict poor outcome for individuals with MSDs, and might be useful for choosing the treatment approach (38, 98, 134–136). The use of self-reported measures can identify individuals at risk of developing physical and mental illness and a high risk of sickness absence can be detected (103, 107, 137, 138), although repeated measurements are necessary to follow the development of symptoms over time. The use of systematic screening can also identify persons with psychological vulnerability, depression and stress-related exhaustion disorder. Self-reported measures can provide an indication of the severity of symptoms and may help the physicians to diagnose the disorder (14, 107, 139). It can be difficult to diagnose depression because comorbidity with pain is common and patients tend to express somatic problems (114, 130). Further research is needed to explore how patient-reported outcome measures can add information to the medical diagnosis and clinical assessments.

Assessment of work ability

The complexity of the work ability concept implies that it should be assessed from a broad, holistic perspective (7, 13, 140), and a combination of methods may be used in order to grasp different aspects of work ability (11, 141–143). Assessment of work ability is often discussed from an insurance perspective, where it serves as the basis for the sickness certificate, and what consequences the disease or injury has on the patients' functioning and work ability (141, 144). From that perspective, the focus is on the sick-listed person's work disability rather than the work ability. The term work capacity is closely related to work ability but is not used in the studies presented in this thesis. Capacity refers commonly to concepts such as strength, flexibility and endurance (73).

Work ability can be described as a balance between a person's health-related abilities, resources, competence and acceptable work demands according to goals. A person's work ability is primarily based on the attributes in the personal system in relation to the workplace system. Several authors have highlighted the interaction between the individual and the work environment where adjustment possibilities are central (7, 11–13, 140, 143). A review by Fadyl et al. (11) identified six categories of important contributing factors to work ability: physical function; psychological function; thinking and problem-solving skills; social and behavioural skills; workplace; and factors outside the workplace. This is in line with Ilmarinen (7), who describes work ability as a complex multi-faceted concept, representing the interaction of individual human resources in relation to different aspects of work, such as work demands, work community, management, and work environment. The human resources include health and functional capacities, education, competence, values, attitudes and motivation. The model has been developed further into the so-called work ability house, where the worker's family, private social life and society are placed next to the house because they have an influence on work ability.

Whether motivation is actually a part of the work ability concept has been questioned (13, 140). If a person has the competence and the ability to work, but not the motivation, is it reasonable to say that the person does not have the ability to work? According to Tengland (140), it is rather that the individual has to be able to stand the job in question. He also suggests two holistic definitions of work ability: one for specific jobs that require special training or education, and one for jobs that most people can manage after a short introduction. A definition that has similarities with Ilmarinen's concept of work ability is Nordenfelt's philosophical definition of work ability, which emphasizes each person's ability to reach their goals and what is acceptable to that person (13). The importance of goals related to each person is also suggested in previous research on work disability and rehabilitation (9, 94, 145).

When assessing work ability, a range of factors need to be considered, and no single method can capture all dimensions. The measurements to capture dimensions of work ability can be divided into self-reported measures, interviews, observations, functional capacity evaluation, workplace assessments, clinical examinations, psychological and physical testing performed by health care professionals (11, 22, 146–148). Assessment of work ability can be performed from other perspectives besides the insurance perspective, such as maintain and improve work ability, analyse the prognosis of future work ability, identify barriers for returning to work, fitness for work, choice of interventions and as a basis for adjusting work tasks (11, 22, 147, 149). Stigmar et al. (142) found among other things that medical knowledge and assessing the real work environment were important when assessing work ability. This requires access to

workplaces as well as knowledge about the work environment and work tasks. Specific observational methods can be useful for analysing work style and work technique at the workplace. The essence of work ability assessment is to evaluate the persons' health-related abilities, resources, competence in relation to work conditions including tasks and demands. The interest in evaluating a person's work ability is reflected in the scientific literature for evaluating status and progress of work ability using the Work Ability Index (WAI) (22, 67, 149, 150). There is a paucity of studies that have enrolled individuals with MSD and MD to examine how short-term sick leave can be understood in relation to diagnosis, health, work ability and work conditions. Few studies have analysed work ability in relation to patients' perceived effect of treatment in the rehabilitation process (150, 151).

The health care system

Primary health care, occupational health services and private health care professionals can all be involved providing measures for individuals with MSD or MD to promote health and return to work in the rehabilitation process. Primary health care is mainly publicly provided in Sweden and is organized to promote health for the entire population. Both medical interventions and rehabilitative interventions are provided in the rehabilitation process, but the mission of primary health care is not related to interventions at the workplace. One of the main tasks for occupational health services is to prevent work-related health problems and work disability for employees, and to give expert advice for establishing and maintaining a healthy and safe work environment (152, 153). Medical, rehabilitative and work-related measures are delivered by occupational health services for employees in the rehabilitation process if their company is signed up for this service and it is sought by the employer. About 65% of working-age individuals have access to occupational health services in Sweden, but the extent to which the employer collaborates with occupational health services varies (152).

A Swedish report from the governmental council of inquiry on rehabilitation (154), suggests that early evidence-based interventions for those on sick leave should increase and be provided by both primary health care and occupational health services with a focus on involving the workplace and the employer in a collaborative process. The need for increased collaboration and communication between stakeholders is also acknowledged in the Netherlands (33, 56, 155), the United Kingdom (32, 94), in Finland (91), and in other western countries (65, 82, 156). The interaction among stakeholders in the process of supporting an individual's return to work is important to consider according to the ecological/case management model (81, 82). Patients

consider their contact with health care professionals as an important part of their rehabilitation that affects recovery and return to work (53, 54, 56, 83, 157). A Swedish study by Müssener et al. (158) based on 5802 individuals on long-term sick leave, showed that the majority experienced positive encounters with health care professionals. Competence, personal attention, and confidence and trust were found to be essential aspects of the interaction. However, research regarding patient-reported judgement of the usefulness of different interventions given in the early rehabilitation process is lacking. It is important for health care professionals to promote health and support individuals in their rehabilitation process and to choose interventions according to each person's prerequisites and their treatment preference. A variety of tools are used in clinical practice to evaluate different aspects of health, work ability and functioning of the care-seeking individual.

The workplace system

In Sweden, employers are responsible for providing workplace rehabilitation and making adjustments to the work environment according to the Work Environment Act. The purpose of the act is to prevent ill health and accidents at work and to achieve a healthy working environment where collaboration between the employers and employees is vital (159). It is the employers' responsibility to determine the requirements for rehabilitation that exists among the workers. Peoples' different physical and mental abilities must be considered when adapting working conditions. Several studies have confirmed the links between stressful working conditions and having MD (108–110). Duijts et al. (42) found that work-related predictors of sickness absence among workers with psychosocial health complaints were related to having low job control, low decision latitude, and experiencing unfairness at work. Earlier studies have also demonstrated the association between MSD and physical and psychosocial work conditions (88, 160, 161) as a cause of sick leave (45–47). If the cause of sick leave is related to the workplace, it can be problematic for return to work if the workplace is unchanged and might be a cause of recurrence.

In research, the Siegrist model of effort-reward imbalance (ERI) is one of the most influential models used to analyse job characteristics and employee's health (162, 163). According to this model, chronic work-related stress is identified as imbalance between high efforts spent and low rewards received (162). Self-report instruments can be used to screen for and identify psychosocial aspects of work for individuals with MD and are broadly accepted within the field of occupational health research. Previous research suggests that occupational factors should be addressed early in the

rehabilitation process by employers and health care professionals in order to choose interventions according to the needs of the patient (33, 60, 122, 128). The use of health and work measures provides information about employees' ability to work and dimensions of return to work (8, 11, 147, 149). It is known from previous research that work conditions and adjustments at work can affect an employee's work ability (7, 11, 15, 164). Opportunities to adjust work to health and choosing among work tasks have been defined by the concept of adjustment latitude in the model of illness flexibility (12). There might be both positive and negative consequences of attending work. Hultin et al. (165) found that there is an increased risk of sickness absence for employees with a low level of adjustment latitude at work. It is obvious that in some cases adjustment can be made within present employment and for others, the solution is a new job where it is possible to adjust the working conditions. Among those recently sick-listed, it was found that 41% had negative expectations about remaining in their present profession in 2 years (166), highlighting the need for providing workplace adjustments and including measures to facilitate job mobility for some sick-listed individuals.

Employers are often considered to be key persons in the rehabilitation process for the employee (167), and their involvement is crucial in supporting employees during sick leave and in phases of return to work. A Swedish interview study comprising workplace actors showed that supervisors and human resources managers saw early contact as part of their supervisory responsibility, but type of contact varied depending on the employees' diagnosis and social situation (168). There is some evidence that collaboration between the sick-listed patient, health care providers and the employer favours the rehabilitation process (60, 83, 129, 169). However, incentives for employers to take greater responsibility for vocational rehabilitation is currently lacking in Sweden. Previous research has shown that access to vocational rehabilitation and work-related interventions seems to be scarce in Sweden (62, 66).

Interventions

The cause of disability and sick leave varies among individuals with MSD and MD, and interventions needs to be chosen based on each person's health- and work-related needs, striving for better health-related quality of life and increased work participation. Evidence suggests that measures for rehabilitation should be provided early in the rehabilitation process to prevent development of long-standing disability (1, 74, 170). Landstad et al. (71) found that delays waiting for treatment influenced the possibilities of returning to work negatively for 52% of the 740 workers on long-term sick leave

that were included in their study. The individual's need for medical treatment, rehabilitative interventions and/or work-related interventions may be more or less extensive depending on their health and working conditions. Several treatment strategies are described in the literature for treating MSD and MD but the evidence for unimodal treatment with regard to the effect on return to work is limited (92, 154, 171, 172). The treatment strategies can vary depending on the severity of the health condition and if the prognosis of the treatment outcome is good or poor according to guidelines for treatment of back pain (124, 133). It is suggested that individuals with a poor prognosis of returning to work may benefit from more comprehensive interventions (32, 156, 172, 173). Assessment at an early stage is recommended to prevent long-term disability and sick leave for both MSD and MD (103, 107, 131, 154).

Clinical interventions encompass a broad range of treatments that may be applied to individuals with MSD and MD. Systematic screening can detect health-related behaviours that the individual might consider changing such as physical activity level, and eating, drinking, and smoking behaviours. Health care professionals are expected to provide lifestyle advice and to promote strategies for self-management (122, 174, 175). Short-time intervention consisting of physical advice in combination with a workplace meeting was found to have an effect on reducing pain and sick leave for patients with low back pain counselled by an occupational physician (176). Physicians in primary health care and occupational health services have a key role in handling sickness absence, prescribing investigations, medications and having dialogue with the patient concerning health-related behaviours and a treatment strategy along with other health care professionals.

Receiving proper medication for mental health conditions can rapidly improve health status, especially for those who have a strong preference for drugs compared with psychotherapy (177). However, only a minority (14%) of patients with depression seeking primary health care prefer medication (178); the majority prefer individual counselling (126, 178). Receiving psychosocial care is associated with higher satisfaction with mental health care for patients with anxiety disorders treated in primary health care, whereas age, gender, illness burden and receipt of pharmacotherapy were not (179). Lang reported (178) that patients were more interested in programs directed at physical health, including fitness and healthy living, rather than stress management and counselling. Favourable short-term effects of physical exercise have been shown for patients with depression (180).

There are gender differences in health care utilization and preference of treatment (126). Women with musculoskeletal pain tend to use more health care and to have an

episode of sick leave compared with men (50, 51) and among depressed patients seeking primary health care, more women prefer counselling than medical treatment (126). The effect of a cognitive treatment approach for patients with persistent MSD has been emphasized in previous research (127, 181–183). How patients cope with their pain and functional limitations may influence the return to work outcome. Tailored behavioural treatment and exercise-based physical therapy can be effective for treating persistent musculoskeletal pain (127), and clinical intervention with a combined behavioural-oriented physiotherapy and cognitive behavioural therapy intervention was found to reduce days on sick leave for women with spinal pain (183). There is increased empirical support for interventions such as cognitive behavioural therapy (CBT), acceptance and commitment therapy (ACT) and mindfulness to help patients improve and accept their condition and to increase quality of life, and research in this area is growing rapidly. When comparing group sessions of ACT with sessions of CBT for patients with chronic pain, Wetherell et al. (182) found that both groups improved equally well concerning pain interference, depression, and pain-related anxiety. However, ACT participants were more satisfied with the intervention compared with the CBT participants. Future research needs to evaluate the effect on improved work ability and return to work of these interventions and to what extent patients can improve their ability to cope with functional limitations in their working life according to their goals.

A clinical-oriented study by George et al. (184) reported that a satisfaction with treatment effect was associated with lower pain and disability for patients with back pain, and better satisfaction with provider can also improve the return to work outcome (185). On the basis of previous research, different forms of exercise can be recommended for patients with neck and back pain (186–189), and supervised exercise programs might be more effective than non-supervised exercise. However, a recent review by Schaafsma et al. (190) showed that the effect of physical conditioning programs in reducing sick leave for workers with back pain seems to be limited in the acute and subacute phase of back pain. Advice to promote physical activity is recommended for individuals with MSD and MD as well as for the population in general (174, 175, 180, 189, 191) and the importance of staying active is emphasized in guidelines for both MSD and MD (107, 124, 133). Inactivity can influence the work capacity negatively and be a barrier for returning to work, and as found by Wijnhoven et al. (192), physical inactivity among women with MSDs was associated with limited functioning. Several studies including patients with MSD on long-term sick leave have indicated that return to work is more successful if workplace interventions are implemented in addition to clinical rehabilitation interventions and multimodal rehabilitation (1, 60, 151, 181, 193).

The term workplace intervention has been defined in a recent Cochrane review on interventions aimed at the workplace (194) as follows: *“interventions focusing on changes in the workplace or equipment, work design and organization (including working relationships), working conditions or work environment, and occupational (case) management with active stakeholder involvement of (at least) the worker and the employer. Active involvement was defined as face-to-face conversations about return-to-work between (at least) the worker and the employer”*. In this thesis, the term work-related intervention is used.

A systematic review (194) of randomized controlled trials evaluating the effectiveness of workplace interventions compared with clinical interventions showed that workplace interventions for MSDs have an effect on reducing sickness absence, but not on health outcome. For employees with neck pain, workplace interventions were found to have a moderate effect on reduced sick leave at short-term follow-up (171), but the evidence is scarce (92, 171). Furthermore, Shiri et al. (195) found that ergonomic intervention at the workplace reduced sickness absence for sick-listed employees with upper-extremity MSDs, but there was no effect on pain outcome. Recently, Lambeek et al. (181) found that clinical rehabilitation interventions performed by a team in combination with workplace interventions including participatory ergonomics and graded activity programs based on cognitive behavioural principles was effective for reducing back pain, increasing functioning and return to work. Research also indicates that work modification seems to be cost-effective for returning persons with MSD to work (193), and there is evidence supporting the economic benefits of ergonomic interventions in the manufacturing and warehousing sectors (196).

Due to lack of studies evaluating the effect of workplace interventions for MD, no conclusions can be drawn (194). However, a recent study provides new evidence that workplace-oriented interventions for persons on long-term sick leave with burnout increase return to work (86). Findings from a Dutch study also indicate that a cognitive behavioural approach combined with workplace advice promotes return to work for workers with psychological complaints (197). Previous research suggested that individual, work-related and system-related factors should be considered to support the individual in returning to and remaining in work (66, 67, 198–201). Scientific knowledge about measures for increased work participation is still lacking and few studies have addressed patient-reported judgement of usefulness of interventions and the effect on work ability among sick-listed patients with MSD and MD.

The legislative and insurance system

When comparing the return to work process in western countries, there are several differences with regard to employment and working conditions, disability policies, health care and social insurance systems (34, 60, 66, 80). The incentive for employers to take greater responsibility for vocational rehabilitation varies between countries depending on laws and insurance systems. However, there are also similarities between countries when comparing experiences of the rehabilitation process and sickness absence (53–56, 65). Internationally, the ecological/case management model has been used to understand the complex and dynamic process of return to work (81, 82). In this thesis, Loisel’s conceptual model of return to work (82) is adapted to the Swedish societal context (figure 2). The model includes the personal system and the health care system, which are emphasized in this thesis, as well as the insurance system and the workplace system.

The Swedish societal context

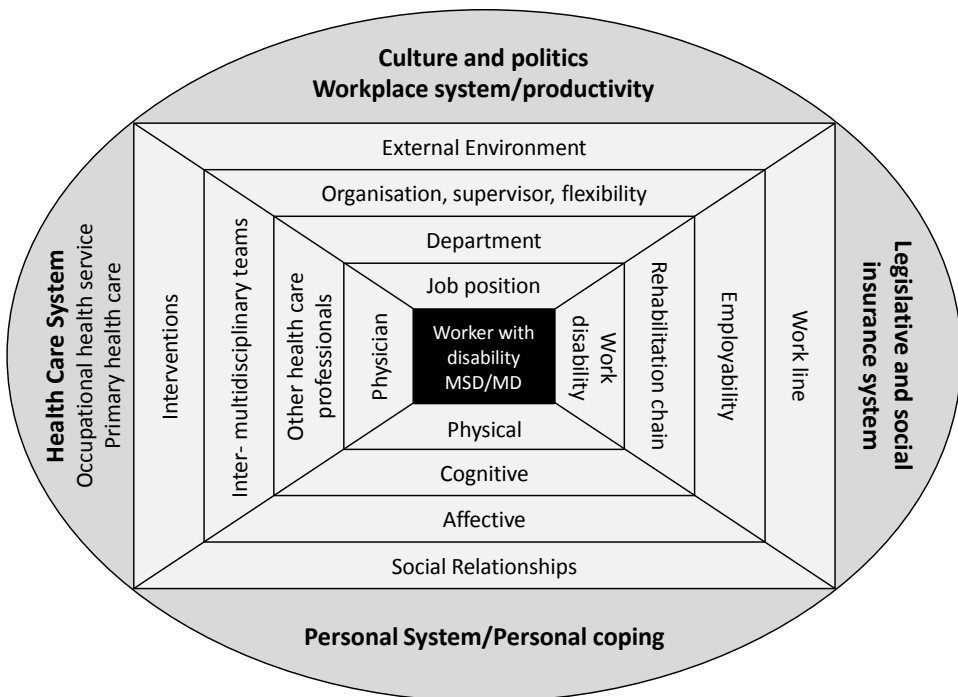


Figure 2. The system of work disability in a Swedish societal context for workers with musculoskeletal disorders (MSD) and/or mental disorders (MD) adapted from the work of Loisel et al. (82), the Sheerbrooke model.

The Swedish labour market is built around the so-called “work line”, emphasizing that everyone has the right to have a job. However, it is not only a privilege; it is also an obligation and as many people as possible should participate and contribute actively in working life if medical reasons do not prevent work participation (144, 202, 203). To qualify for sickness benefit in Sweden, a disease has to impair work ability in relation to the specific demands of the person’s work or to the demands of another available job on the labour market. From an insurance perspective, both a medical diagnosis and an evaluation of functioning are required in the assessment of work ability (144). In order to create possibilities of increased participation in working life for persons with disabilities, the Swedish government introduced reforms in the national sickness insurance system in 2008 (the rehabilitation chain), focusing on early assessments of work ability, right to benefits and the use of evidence-based methods for return to work (203). The primary goal within the first 90 days in the rehabilitation chain is to return to ordinary work if possible. Employers have a responsibility to investigate whether other work tasks and/or work conditions can be adjusted so the employee can work even though illness exists. After 90 days, the ability to work is assessed in relation to any available work for the same employer. In the final step, after 180 days of sick leave, the work ability of the sick-listed person is assessed in relation to any work in the regular labour market. To further increase the possibility of labour market integration, the Swedish government renewed economical support to local authorities and regions for 2012, with the goal of providing evidence-based measures for increased return to work for those on sick leave and to prevent sickness absence for working-age individuals with MSD and MD. For employees who have ill health due to their present working conditions, changing job seems to have a positive influence on physical and mental health as well as on job satisfaction (204).

The rehabilitation process can be studied from many different perspectives. This thesis is based on research performed within a Swedish societal context in occupational health services and primary health care focusing on biopsychosocial assessment and the rehabilitation process for working-age individuals with MSD and MD. The individual who seeks health care has a prominent role in this thesis: how they perceive their health status, physical and mental functioning, work ability, work conditions and usefulness of interventions in the rehabilitation process, especially when on sick leave. Few studies have explored from a patient perspective what type of interventions are given in the early rehabilitation process for patients with MSD and MD, considering the patient’s health condition, personal- and job-related factors and patient-reported usefulness of interventions.

AIMS OF THE THESIS

Overall aims

The overall aims of the thesis were the following:

- to increase knowledge about biopsychosocial assessment of health, functioning and work ability for care-seeking individuals with musculoskeletal disorders and/or mental disorders.
- to gain better understanding of praxis behaviour in the rehabilitation process for sick-listed patients with musculoskeletal disorders or mental disorders, specifically by evaluating patient-reported work ability, type of interventions given, usefulness of interventions and return to work.

Specific aims

The specific aims were the following:

- to describe differences in self-reported work ability, work conditions, health and function in ICD-10 groups with (1) musculoskeletal disorders, (2) mental disorders, and (3) musculoskeletal and mental disorders (study I),
- to analyse which variables are associated with sick leave status (study I),
- to study the association between professional assessment of a patient's main clinical problem and the patient's self-reported health and work status (study II),
- to improve understanding of how health- and work-related measures are used in clinical reasoning and their relation to recommended clinical- or work-related interventions (study II),
- to explore patient characteristics in relation to the rehabilitation process for sick-listed patients with musculoskeletal disorders or mental disorders, by comparing patients receiving clinical intervention versus combined clinical and work-related intervention (study III),
- to analyse factors associated with return to work (study III),
- to investigate the relationship between the type of interventions given in the rehabilitation process, the patient's judgement of its usefulness and the effect on self-reported work ability (study IV).

MATERIALS AND METHODS

This thesis comprises four studies based on two different cohorts collected from primary health care and occupational health service units in the south-eastern part of Sweden. The study populations are those with MSD and/or MD of working age.

Design

A cross-sectional design was used for studies I and II including individuals diagnosed with MSD and/or MD seeking occupational health services. Studies III and IV are based on the Return to Work East Sweden Study (ReWESS), a longitudinal cohort study with a 3-month follow-up comprising individuals who sought primary health care or occupational health services for MSD or MD and were sick-listed. An overview of the four studies is given in table 1.

Table 1. Overview of studies I–IV

	Study I	Study II	Study III	Study IV
Study design	Cross-sectional	Cross-sectional	Longitudinal ReWESS study	Longitudinal ReWESS study
Study setting	OHS	OHS	PHC, OHS	PHC, OHS
Population	MSD and/or MD Employed	MSD and/or MD Employed	MSD, MD Employed	MSD, MD Employed and unemployed
Number of subjects	210	210	699 ^a	810
Women % (number)	87 (182)	87 (182)	71 (498)	72 (583)
Mean age (SD)	45 (10)	45 (10)	48 (11)	46 (11)

MSD, musculoskeletal disorders; MD, mental disorders; OHS, occupational health service; PHC, primary health care.

^a *Includes only patients who had employment at 3-month follow-up.*

Subjects and study setting

The inclusion criteria for the four studies were: patients diagnosed with MSD and/or MD, between 18 and 65 years old, and had good knowledge of Swedish.

Specific inclusion criteria for studies I and II were: individuals visiting occupational health services with MSD and/or MD. Both sick-listed individuals and those who were not sick-listed were included. Specific inclusion criteria for studies III and IV (ReWESS) were: individuals sick-listed by physicians in primary health care or occupational health services for MSD or MD with diagnoses classified according to the ICD-10. The following exclusion criteria were applied for all studies: having a psychiatric diagnosis such as schizophrenia and psychotic disorders, neurologic disorders, rheumatic disease, fracture, or pregnancy. Specific exclusion criteria for studies III and IV were: being sick-listed for the same diagnosis in the previous month.

Occupational health services study: Studies I and II

Studies I and II were performed at an occupational health service provider in the south-eastern part of Sweden, in the county of Östergötland and Småland. A convenience sample was consecutively recruited between April and December 2006 when subjects were visiting the occupational health service units in Linköping, Motala, Norrköping and Tranås. One hundred ninety-five subjects were asked to participate in the study when they consulted a physician and/or physiotherapist. Six persons seeking occupational health services turned down the offer to participate. An additional 40 subjects on sick leave were recruited from the regional social insurance office. After the inclusion period, 19 subjects were excluded because they did not return the questionnaire or they did not want to continue being part of the study. Thus, a total of 210 subjects were enrolled in the study, including 64% on sick leave. A flowchart for inclusion in studies I and II is presented in figure 3.

The subjects with MSD had various conditions; the most frequent diagnosis according to ICD-10 was dorsopathies with disorders of disc and muscles, shoulder and arm lesions, arthropathies, and disorders affecting peripheral joints (M50–54, M60, M62, M75, M77, M79, M25). The most common diagnoses among subjects with MD were varying degrees of stress, burnout/exhaustion syndrome, anxiety, anguish, depression, and panic disorder (F32, F33, F41–43, Z73, Z73.3).

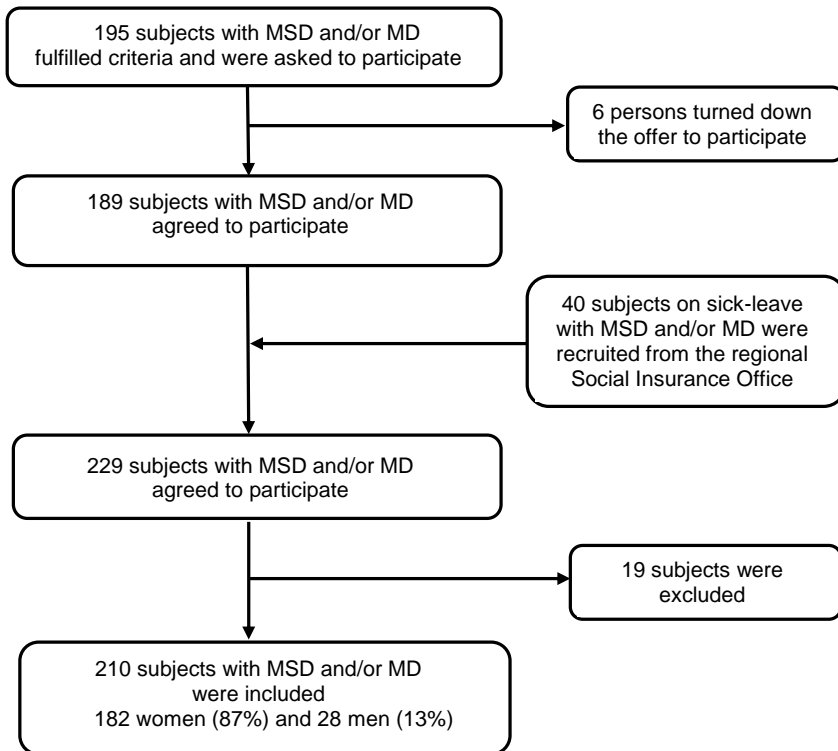


Figure 3. Flowchart for inclusion in the occupational health services study (studies I and II).

ReWESS: Studies III and IV

In studies III and IV, patients who were granted sick leave due to MSD or MD were recruited at 39 primary health care centres and five occupational health service units in the county of Östergötland, Sweden. Inclusions were based on an ICD-10 diagnosis on the sickness certificate issued by physicians. Subjects were recruited by telephone consecutively from June 2008 to December 2009. The baseline questionnaire was sent to the patients directly after they were included. A total of 1376 subjects were recruited; 413 subjects were excluded because they did not return the questionnaire or they did not want to continue participating in the study. Thus, the final study sample consisted of 963 subjects on sick leave who answered the baseline questionnaire. The patients were followed up after 3 months using a postal questionnaire. If necessary, they were reminded by telephone a maximum of twice before being classified as non-responders.

A total of 810 subjects returned the questionnaire and this was the final study population in study IV. Study III was based on 699 subjects who answered both questionnaires and who had employment at the 3-month follow-up. The ICD-10 diagnoses for MSD patients were mostly dorsopathies, soft tissue disorders, other joint disorders and injuries (M50–54, M70–79, M20–25, S00–T98). For MD patients, the diagnoses were mostly depression reactions to severe stress and adjustment disorders, other anxiety disorders and burnout/vital exhaustion (F32–39, F43, F41, Z73). A flowchart for inclusion in studies III and IV is presented in figure 4.

Non-responder analysis

Of 1376 invited participants, 963 patients returned the baseline questionnaire. The 413 non-responders were significantly younger ($p<0.001$) and included more men ($p=0.02$). The groups did not differ regarding the distribution of an MD and MSD diagnosis ($p=0.08$). Eight hundred and ten patients returned the 3-month follow-up questionnaire. The 153 non-responders of the baseline cohort were significantly younger when comparing age distribution ($p=0.04$), although no differences were found in distributions of sex ($p=0.24$) and diagnosis ($p=0.8$).

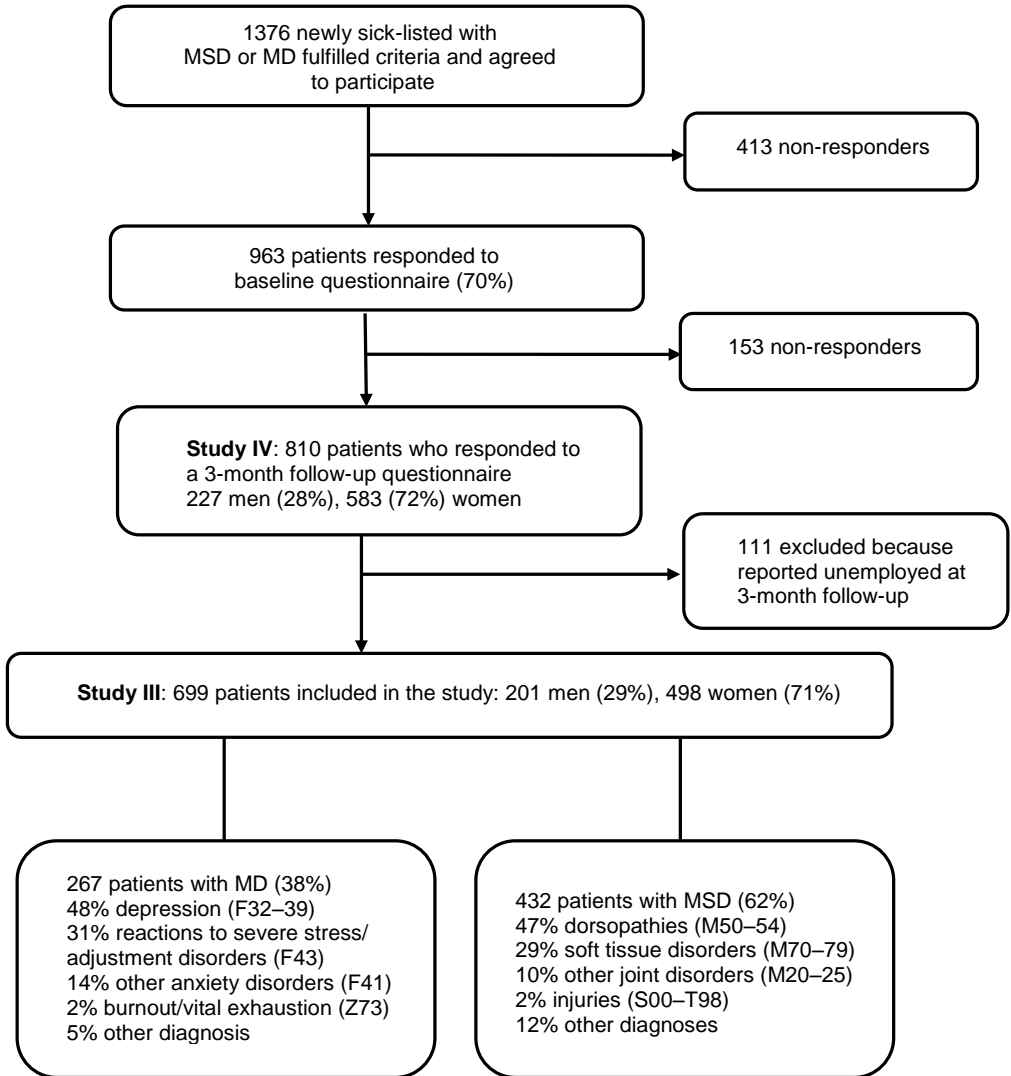


Figure 4. Flowchart for inclusion in ReWESS (studies III and IV) of newly sick-listed patients with MSD and MD.

Dimensions of measurements

An overview of the measures and outcomes used in the four studies is presented in table 2. The evaluation was based on the patients' self-reported measures and professional measures.

Table 2. *Dimensions of measurements used in the four studies, based on self-reported measures and professional assessments*

Variables	Study			
	I	II	III	IV
SELF-REPORTED MEASURES				
<i>Socio-demographics</i>				
Gender	X	X	X	X
Age	X	X	X	X
Marital status	X	X	X	X
Educational level	X	X	X	X
Economic worries			X	
Sick leave			X	X
<i>Health-related factors</i>				
Health-related quality of life	X	X	X	
Mental functioning	X	X	X	
Physical functioning	X	X	X	
Social support		X	X	
Self-efficacy			X	
Activity limitation		X		
Work ability	X	X	X	X
<i>Working life</i>				
Type of work	X	X	X	X
Work conditions	X	X	X	
Return to work expectations			X	
<i>Process measures</i>				
Type of intervention			X	X
Usefulness of intervention				X
<i>Outcome measures</i>				
Return to work			X	
Effect on work ability				X
PROFESSIONAL MEASURES				
ICD-10	X	X	X	X
Sick leave	X	X	X	X
Duration of health problem	X	X		
Main clinical problem		X		

A description of the questionnaires and measures is given in the following sections.

Socio-demographics

In all four studies, the subjects answered a baseline questionnaire on demographic variables such as age, sex, marital status, educational level, occupation, employer and sick leave status. The patient's educational level was categorized into two groups: lower education and higher education. Those belonging to the group with higher education had a university degree. In study IV, profession was coded according to the Swedish standard for occupational classification (Statistics Sweden) with nine occupational groups categorized into white collar (managers, academics, etc.), pink collar (care, service, salespersons, etc.), and blue collar (industry, etc.).

Health-related quality of life

Health-related quality of life was measured in studies I, II and III, using the self-administrated instrument, EuroQol-5D (EQ-5D) (205, 206). EQ-5D consists of five dimensions that describe health-related quality of life in terms of mobility, self-care, usual activities, pain and discomfort, anxiety and depression. Each dimension is divided into three levels (no, some, severe problems), yielding a total of 243 possible states. A tariff for transforming states into scores ranging from -0.59 (worse than death as 0=death) to 1 (perfect health) related to a UK population study (207). The second part includes the EQ visual analogue scale (EQ-VAS) with end points of zero for the worst imaginable health state and 100 for the best imaginable health state. The reliability and the validity of EQ-5D has been tested in several studies with satisfactory results (208).

Mental functioning

A modified version of the Zung Self-Rating Depression Scale (ZSDS) was used in studies I and II to measure current severity of depressive symptoms (209). This scale covers affective, psychological, and somatic symptoms. The 23 items have a 0–3 rating scale and a total score of 0–69, with 0 representing no signs of depression. The Modified Somatic Perception Questionnaire (MSPQ) was used in study I. This questionnaire includes 13 items that identify somatic complaints that may be associated with psychological responses such as anxiety or depression (209, 210). The items are recorded from 0 to 3 and the total score is from 0 to 39; higher scores indicate more problems. The Shirom Melamed Burnout Questionnaire (SMBQ) was used in studies I and III. SMBQ includes 22 items graded from 1 to 7 that measure different aspects of the burnout syndrome such as physical fatigue, tension, emotional

exhaustion, listlessness and cognitive difficulties (211). High scores indicate more symptoms. The overall burnout index (SMBQ-Global) is the average of the 22 items. A high level of burnout on the SMBQ has been defined as a mean value of ≥ 3.75 and a low degree of burnout as a mean value of <2.75 (111).

Social support

Social support was measured in studies II and III using the Orth-Gomér instrument, also known as availability of attachment (212, 213). This instrument has its origin in the Interview Schedule for Social Interaction (ISSI). The questionnaire includes questions about the availability of deep emotional relationships and support from family and close friends. One dimension was used in the studies: availability of social integration (AVSI). Each dimension in AVSI consists of six items ranging from 6 to 36. Higher scores indicate better social support.

Return to work expectations

Expectations for return to work were measured in study III by asking the question “In your estimation, what are the chances that you will be working in 6 months?” This question was rated on a 5-point scale where 1 was “very good chance” and 5 was “very little chance”. Similar question on expectations for return to work have been used in previous research (68).

Self-efficacy

Self-efficacy was measured in study III using the Self-Efficacy Scale (SES). Patients were asked to rate their ability to perform, despite their pain, 20 daily activities: taking out the trash, concentrating on a project, going shopping, playing cards, shovelling snow, driving the car, eating in a restaurant, watching television, visiting friends, working on the car, raking leaves, writing a letter, doing a load of laundry, working on a house repair, going to a movie, washing the car, riding a bicycle, going on vacation, going to a park, and visiting relatives (214). The patients rated their ability on an 11-grade scale, with 0 for not confident at all about performing the activity and 10 for very confident. Higher scores indicated higher perceived self-efficacy and the total range was 0–200 points. The Swedish version has been used in earlier studies for patients with musculoskeletal pain (134, 215).

Physical functioning

The Functional Rating Index (FRI) was used in studies I–III to measure function and pain in the musculoskeletal system. Using a 5-point scale, the instrument consists of 10 questions pertaining to pain intensity, sleep, personal care, travelling/driving, ability to work, recreation, frequency of pain, lifting, walking and standing (216). The total FRI score is calculated by adding all the responses as recommended by Feise et al. (216) ($\text{total score}/40 \times 100\%$) and the range of scores is 0–100%; higher scores indicate higher perceived dysfunction and pain. FRI is considered to be a valid and reliable instrument to measure subjective perception of function and pain in the musculoskeletal system (216, 217).

Activity limitation

The Patient-Specific Functional Scale (PSFS) was used in study II and provides a method for measuring a patient's disabilities by asking the patient to prioritize specific activities that are important to them (218). The activities are evaluated on how limited their performance is on a scale of 0 to 10, where 0 stand for inability to perform the activity and 10 stands for full ability to perform the activity. The PSFS has been used in earlier studies for patients with MSD to investigate functional status (218–220). Gross et al. (221) found that PSFS can also be used as an indicator of functional limitation in worker compensation claimants. The PSFS was found in a recent systematic review to be valid and reliable in populations with MSDs (220), but PSFS needs to be tested further on other patient groups. In our study, activity limitation according to the PSFS was documented by the physiotherapist when seeing the patient at the clinic.

Work ability

The Work Ability Index (WAI) was used to evaluate the subjects' self-rated work ability (148) in studies I and II. This instrument includes seven items answered using a Likert scale on current work ability compared with lifetime best, work ability in relation to the demands of the job, the number of current diseases diagnosed by a physician, estimated work impairments due to diseases, sick leave in the past year, psychological resources, and personal prognosis of work ability. The total scores range from 7 to 49 points and are usually categorized into four groups of work ability: (1) poor, ≤ 27 points; (2) moderate, 28–36 points; (3) good, 37–43 points; and (4) excellent, 44–49 points (148). Scores can be dichotomized into employees with poor

work ability (7–36 points) and employees with good work ability (37–49 points) as used by Rotenberg et al. (21). The WAI is shown to have good psychometric properties and is considered to be an internally coherent and reliable instrument (222, 223). In studies III and IV, work ability was measured with the first item “current work ability compared with the lifetime best” in the WAI (148). The score was graded from 0 to 10, where 0 stands for completely unable to work and 10 stands for work ability at its best. The first item of the WAI has previously been used to assess work ability among sick-listed individuals by Ahlstrom et al. (150), who found that the item is a good alternative to the WAI. Alavinia et al. (149) have shown that this item has predictive power for future disability.

Work conditions

Effort–reward imbalance at work was measured in studies I–III using the Effort–Reward Imbalance Questionnaire (ERI) published by Siegrist et al. (162). Effort was measured using six items on quantitative and qualitative work load, increase in total load over time and physical work load. The higher the perceived distress due to high effort at work, the higher the resulting effort score. Reward was measured using 11 items on esteem, salary/promotion, and job security. The lower the reward score, the less the perceived reward at work (162). The effort and reward questions were answered using a 4-point Likert scale ranging from 1 (not correct at all) to 4 (correct) (163). The ratio of effort to reward expresses the amount of perceived effort–reward imbalance at work and is calculated using the formula described by Siegrist et al. (162). The effort/reward ratio is high when the effort–reward imbalance quota is greater than 1. Overcommitment (OC) was assessed in study I using 6 items measuring personal patterns of coping with work demands on a 4-point Likert scale. The score varies from 6 to 24 and a high score indicates that the subject is likely to experience OC at work (162, 163). The validity and reliability has been tested for effort, reward and OC with satisfactory results (162, 163, 224).

Perceived physical strenuousness of work was measured using the Borg Scale, ranging from 6 to 20, asking the question: “How physically strenuous do you consider your work is on average?”

Process and outcome measures in ReWESS

A 3-month follow-up questionnaire was used in studies III and IV comprising both process and outcome measures. Self-reported work ability was used as an outcome measure and followed up by using the single-item question concerning the WAI item “current work ability compared with the lifetime best” (148–150).

The 3-month questionnaire also included questions on return to work, the type of visits with health care providers (primary health care, occupational health service, and private health service), type of intervention modalities they received and patient judgement of usefulness of interventions. Information on work-related interventions was derived from the following open question: “What interventions/changes have been made at the workplace in order to facilitate your return to work?”

The primary outcome measure in study III was return to work within 3 months. This was obtained using a patient self-reported measure via the question “Have you returned to work?” with alternatives yes or no. In study IV, the patient’s judgement of usefulness and the effect of health care contacts on work ability were used as a process measure to evaluate the early rehabilitation process. Patients were specifically asked about the effect on work ability due to health care contacts on a 5-point scale with anchor points ranging between “yes, my work ability is much improved” and “no, my work ability has become much worse”. The patient’s judgement of the usefulness of medical intervention modalities and rehabilitative intervention modalities was measured using a 5-point scale with anchor points ranging between “very good usefulness” and “very poor usefulness”. A similar evaluation of patient’s self-reported satisfaction with health care was used by Lambeek et al. (68) and van Oostrom (129) also using a 5-point scale. In our study, the median value of all specific usefulness ratings of the interventions was used as a measure of overall usefulness.

Analysis of subjects and interventions

The study populations and interventions were analysed with different approaches in each study and categorized based on diagnosis, sick leave status, main clinical problem and type of recommended intervention and intervention received in the rehabilitation process.

Studies I and II: the biopsychosocial approach

In studies I and II, the approach of analysing subjects was influenced by aspects of the biopsychosocial model presented in previous research (2, 81, 225). According to Schultz et al. (81) the comprehensive biopsychosocial model incorporates medical/biological factors, psychosocial, environmental and ergonomic factors, and should be considered to understand human illness and disability. The model emphasizes the perspective of the person on their physical and mental health problem and their social context. Successful rehabilitation includes identification of biopsychosocial obstacles and finding ways of overcoming these to enhance recovery and return to work (2). Structured risk factor screening including biomedical, psychosocial and ergonomic aspects can be helpful to understand factors associated with delayed functional recovery and for choosing interventions (2, 225). Based on the biopsychosocial model, the analyses in studies I and II included both the patient's perspective with self-reported measures and the health care professional's assessment, identifying patients' current health condition and main clinical problem.

In study I, differences in self-reported work ability, work conditions, health and function in ICD-10 groups are analysed as well as factors associated with sick leave. In study II, professional assessment of the patient's main clinical problem and self-reported health were analysed in relation to recommended interventions.

Studies I and II: Procedure

Experienced physiotherapists at the occupational health service unit summarized the patients' clinical findings made by the physicians' and/or physiotherapists. No analyses of medical records were performed. Instead, the information was gathered from the clinical assessment using a checklist for registration of the following variables: diagnosis classified according to ICD-10, duration of the patient's problem classified as an acute, subacute or long-standing problem, sick leave status with alternatives yes or no, main clinical problem, functional limitations and recommended interventions. The professional assessment was performed blinded for the patient-reported outcome measures, except for the PSFS, which requires a dialogue between the physiotherapist and the patient. Patients filled out the questionnaire after completing the visit with the health care professional either at the clinic or by bringing the questionnaire home and returning it in a stamped envelope.

In study I, the subjects were grouped according to their medical diagnoses according to ICD-10 (85). When depression, burnout syndrome, anxiety and panic disorders were the main cause of sick leave, the physicians' classification according to ICD-10 was used. For stress and MSD, a physician or a physiotherapist made the classification. The study subjects were classified into: MSD, MD and MSD+MD.

In study II, the study subjects were grouped according to their main clinical problems. The physiotherapists were instructed to identify the main clinical problem for each patient for recommendation of treatment. The main clinical problem was defined as an identified, predominant, current problem affecting the patient's health situation and work ability, and is an obstacle for recovery. The patients' main clinical problems were grouped into: medical/organic, psychosocial or physical work-related problems. Activity limitations according to the PSFS were documented by the physiotherapist when seeing the patient at the clinic. The documented activities according to PSFS were then categorized by the researcher describing the type of activity the patient had difficulties in performing. The activity limitations were then sorted by the researchers into four main categories: limitations of physical activities, limitations of social interaction, limitation of cognitive abilities and limitations of work-related tasks. When analysing the mean score for each of the main categories, the first reported activity limitation was noted in each main category for each patient.

The physiotherapists also noted what type of intervention was recommended for the patient by the occupational health professionals (physician, physiotherapist/ergonomist, behavioural therapist, psychologist and nurse). The documented interventions were categorized in three steps. In the first step, all interventions were listed for each patient. In the second step, each intervention was sorted by the researcher into subgroups describing the type of clinical interventions (seven types) and work-related interventions (seven types). Clinical interventions comprised activities to enhance the patients' mental and physical capacity and function. The work-related interventions comprised changes in the workplace, work conditions, work adaptation or other work-related conditions. In the third step, the interventions were categorized into clinical interventions or work-related interventions.

ReWESS – the early rehabilitation process

In studies III and IV, the analyses focused on the early rehabilitation process and the intervention received in the first 90 days according to the time limits in the rehabilitation chain (203). The analyses were performed for the two diagnostic groups separately: patients with MSD and patients with MD. In study III, the patients were

grouped based on the intervention given: those who were given clinical intervention only, and those who were given a combination of clinical and work-related interventions. The patients in the clinical intervention group received clinical interventions from at least one health professional (physician, physiotherapist, occupational therapist, behavioural therapist, psychologist or nurse). Those who were classified into the work-related intervention group received some kind of intervention at the workplace. Factors associated with return to work were analysed based on personal, health and work-related factors and type of intervention received. In study IV, patient-reported interventions were further categorized. First, all interventions were listed for each patient and categorized into types of interventions. Medical intervention modalities were categorized into three types: medical treatment, medical investigation and other medical treatment. The rehabilitative intervention modalities were categorized into six types: health care advice, behavioural treatment (therapeutic conversation, cognitive therapy, body awareness), exercise therapy/physical activity, manual treatment (manual, acupuncture/transcutaneous electrical nerve stimulation), ergonomic advice given at the clinic/activities of daily living, equipment/orthosis and other). In this study, a multimodal treatment approach was defined as receiving two or more rehabilitative intervention modalities. The patient's description of work-related interventions was categorized into six types: ergonomic, adjustments to work tasks/work environment, change of work tasks/employment, change to working hours, rehabilitation support and other work-related interventions.

Three groups of interventions: medical intervention, clinical rehabilitative intervention, work-related intervention

In study IV, each patient's description of interventions was categorized into three groups based on the interventions they received, identifying three types of rehabilitation processes. The group referred to as the medical intervention group (MI) received only medical intervention modalities. Those who received a combination of medical and rehabilitative intervention modalities are referred to as the clinical rehabilitative intervention group (CRI). The third group are those who received work-related interventions in combination with medical or rehabilitative intervention modalities and are referred to as the work-related intervention group (WI). The results are presented separately for the MSD and MD diagnostic groups.

Statistical analysis

An overview of the statistical methods used in the four studies is shown in table 3. Statistics were calculated using SPSS (version 14.0–19.0; SPSS Inc., Chicago, IL). All tests were two-sided with a significance level of $p < 0.05$. Descriptive analyses for the total population and subgroups were carried out using proportions or means with standard deviations (SD) or 95% confidence intervals (95% CI) for the variables assessed. Group comparisons were made using the independent sample t test, Pearson's χ^2 test and ANOVA with the Bonferroni post hoc test for all pair-wise comparisons. For adjusted analyses of group differences, ANCOVA was used in studies II and III.

In studies I and III, logistic regression analysis was used to test the association between different explanatory variables and being on sick leave and returning to work, respectively. In study I, a forward step-wise procedure was used and in study III, explanatory variables were entered block-wise in three steps.

Table 3. *Statistical methods used in the studies*

Statistical method	Study			
	I	II	III	IV
Descriptive analyses	X	X	X	X
Pearson's chi-square test	X	X	X	X
Independent samples t test	X		X	X
Analysis of variance/covariance	X	X	X	X
Logistic regression	X		X	

Ethical considerations

Ethical considerations are of great importance when planning and conducting studies on individuals with disabilities who are seeking care. All researchers involved in such studies have a personal responsibility and must be aware of ethical and legal aspects when performing research. The Declaration of Helsinki and the act on the Ethical Review of Research Involving Humans provide guidance on the ethical principles for research on humans. This has been developed by the World Medical Association to guide physicians and other participants in medical research on human subjects (226). Health care professionals' adherence to ethical rules of clinical research protects participants and preserves the trust of both the patients and the public (227). In general, each profession also has its own ethical codes.

Initially when planning the studies and throughout the inclusion period, the research group discussed the ethical aspects of the studies and dealt with ethical questions that occurred. Approval for the studies was given by the Regional Ethics Committee in Linköping, Östergötland, Sweden (Dnr M78–05, Dnr T14–08). An individual seeking care might be in a dependent position with the health care provider they have contact with and might feel obliged to participate in a clinical study. There are several ethical issues related to assessment of work ability and sick leave (64). The individual seeking care is dependent on physicians' and other health care providers' assessment of health, function and work ability in order to apply for sickness benefit. From a professional perspective, work ability assessments can be in conflict with the role of supporting the patient and providing information for the sickness certificates as a basis for decisions regarding entitlement to sickness insurance benefits (142).

In the cross-sectional study performed at the occupational health service unit (studies I and II), all individuals who visited the clinic and were asked to participate in the study received information that participation was voluntary, and that it would not affect their contact with health care professionals if they chose not to participate. In studies III and IV, the subjects were recruited by telephone and they received the same information. All subjects included in studies I–IV received written and verbal information about the studies and all gave their consent to participate. Information was provided that they could withdraw from the study at any time without giving an explanation and this was not going to affect planned treatment or contact with their health care providers. The design of the studies entailed no treatment risk or consequences for the study subjects.

RESULTS

The main findings of the four studies are presented below, summarized in table 8. Additional results are presented in the separate papers.

Biopsychosocial assessment in occupational health services (studies I and II)

Two hundred and ten individuals with MSD and/or MD (182 women and 28 men) were included in the occupational health service study (studies I and II). The average age was 45 years (SD 10.3). The majority were on sick leave (64%) and 81% reported long-standing symptoms (>3 months). Nearly half of the subjects (48%) had a university education. 22% lived alone. Eighty-one percent of the subjects worked within the public sector and 19% had a private employer. The most common occupations were health care-related and administrative professions.

Self-reported and professional measures (study I)

In study I, we found that according to the ICD-10 classification, 44% had MSD, 22% had MD, and 34% had MSD+MD. When comparing the three diagnostic groups from a broader perspective including self-reported patient measures we found that health, mental and physical functioning were significantly different between groups. The highest proportion of individuals with poor work ability was found in the comorbidity group, those with MSD+MD (86%), followed by the MD group (76%), and the MSD group (56%). Poor work ability was significantly more prevalent within the MSD+MD group compared with the group who only had MSD ($p=0.003$). The group with MSD was significantly less disabled according to measures of work ability, health, mental functioning and work conditions. The group with MD had significantly better physical functioning compared with the two other groups.

Association with sick leave

Individuals on sick leave reported worse health, mental functioning, physical functioning, work ability and work conditions compared with those who were not on sick leave. The self-reported measures EQ-5D, EQ-VAS, ZSDS, MSPQ, FRI, ERI, OC, WAI, and the ICD-10 group, were included as independent variables in the regression model. The results of the regression model showed that belonging to the MD group ($p<0.001$), belonging to the MSD+MD group ($p<0.001$), having poor work ability according to the WAI ($p=0.002$) and poor functioning according to the FRI ($p=0.001$) significantly contributed to the explanation of sick leave (table 4).

Table 4. Independent variables predicting sick leave using a forward step-wise logistic regression analysis, adjusted for age and gender

Independent variables	Beta value	Wald	df	Odds ratio	95% CI	p-value
Belonging to the MD group	3.9	27.8	1	47.4	11.3–199.0	<0.001
Belonging to the MD+MSD group	2.5	17.9	1	11.8	3.8–37.2	<0.001
WAI	1.7	11.8	1	5.5	2.1–14.6	0.001
FRI	0.07	15.7	1	1.07	1.04–1.1	<0.001

CI; confidence interval, df; degrees of freedom, FRI; Functional Rating Index, MD; mental disorders, MSD; musculoskeletal disorders, WAI; Work Ability Index.

Clinical reasoning (study II)

In study II, the clinical reasoning was based on a biopsychosocial model identifying three groups with different main clinical problems: medical/organic problem (39%), psychosocial problem (46%) and physical work-related problem (15%). There were no gender differences between the groups. Age was significantly lower in the group with physical work-related problems compared with the other groups. Educational level was higher in the group with psychosocial problems compared with the group with medical/organic problems.

Main clinical problem

The group with physical work-related problems had better health, as measured with EQ-5D, better work ability (WAI) and a higher physical work load, and they reported activity limitations mainly concerning physical activities and specific work tasks as most difficult according to the PSFS. The group with medical/organic problems had significantly worse physical functioning in FRI compared with the two other groups and they had activity limitations (PSFS) mainly concerning physical activities and social interaction. The group with psychosocial problems had significantly less physical work load, and were significantly more disabled than the patients in other groups in measurement of mental functioning (ZSDS), and 82% of the patients in this group had activity limitations involving social interaction according to PSFS.

Recommended interventions

In the clinical reasoning process, both clinical interventions and/or work-related interventions were recommended to the study subjects. The most common recommended intervention in the group with medical/organic problems and in the group with physical work-related problems was individual exercise therapy/physical activity. Training in work technique and ergonomic intervention was recommended for the group with physical work-related problems. For the group with psychosocial problems, behavioural treatment and coaching were the most common recommended interventions and 21% in this group had a need for change of employment. Clinical intervention was recommended more often in the group with medical/organic problems; the other two groups were more frequently recommended a combination of clinical and work-related interventions. Fifty-four percent of the patients were recommended a combination of clinical interventions and work-related interventions.

Clinical versus work-related interventions

The clinical reasoning processes were different depending on the main clinical problem identified and type of recommended intervention. Table 5 presents the results for the groups who were recommended clinical interventions versus those who were recommended work-related interventions with regard to the main clinical problem, health, mental functioning, physical functioning, social support, work ability and work conditions.

Table 5. Comparison between those who were recommended clinical interventions and those who were recommended work-related interventions, for the main clinical problem, educational level, work ability, health and functioning. Scores are presented as percentages and frequencies (n). Only significant health- and work-related measures are presented

Variable	Recommended clinical intervention (N=87), % (n)	Recommended work-related intervention (N=123), % (n)	p-value
Medical/organic problem			
Yes	51 (44)	30 (37)	0.003
No	49 (43)	70 (86)	
Psychosocial problem			
Yes	37 (32)	53 (65)	0.021
No	63 (55)	47 (58)	
Physical work-related problem			
Yes	13 (11)	17 (21)	n.s.
No	87 (76)	83 (102)	
Educational level			
Higher education	36 (31)	57 (70)	0.002
Lower education	64 (56)	43 (53)	
Work ability (WAI)			
Poor work ability (7–36)	63 (54)	76 (93)	0.046
Good work ability (37–49)	37 (32)	24 (30)	
Activity limitations (PSFS)			
Difficulties with social interaction	39 (31)	61 (69)	0.003
No difficulties with social interaction	61 (49)	39 (45)	
Health: EQ-5D			
Poor mobility EQ-5D (2–3)	26 (23)	15 (18)	0.039
Good mobility EQ-5D (1)	74 (64)	85 (103)	

EQ-5D, EuroQol; n.s., not significant; PSFS, Patient-Specific Functional Scale; WAI, Work Ability Index. The following variables were not significant: EQ-5D, EuroQol (self-care, usual activities, pain/discomfort, anxiety/depression); AVSI; ERI; FRI; and PSFS (yes, having limitations concerning physical activity, cognitive/psychological activities, and work-related tasks).

The results of the analyses show that significantly more patients with psychosocial problems ($p=0.021$), poor work ability ($p=0.046$), higher educational level ($p=0.002$) and those having difficulties with social interaction according to PSFS ($p=0.003$) were recommended work-related interventions. Significantly more patients with medical/organic problems ($p=0.003$) and those having poor mobility according to EuroQol ($p=0.039$) were recommended clinical interventions.

The early rehabilitation process for sick-listed patients (studies III and IV)

The timeframe for both studies III and IV was the early rehabilitation process. The studies are based on the same cohort, the ReWESS study, but in study III, only those with employment at the 3-month follow-up were included. The majority of the study population were recruited from primary health care (93%) and only a few from occupational health services (7%).

Association between interventions and return to work (study III)

Study III is based on a cohort of 699 patients, classified according to ICD-10 in two groups: 62% with MSD and 38% with MD.

Patients with MD

For those patients who had MD and received combined interventions, the mean age was lower ($p=0.03$), their educational level was higher ($p<0.001$), and their return-to-work expectations were higher at baseline ($p=0.04$) compared with those who received clinical intervention. The group of patients who received combined intervention had at baseline significantly better social support ($p=0.02$), better physical functioning according to FRI ($p<0.05$), better self-efficacy according to SES ($p=0.04$) compared with those who received clinical intervention. There were no significant differences between the intervention groups concerning measures of health (EQ-5D, EQ-VAS), mental functioning (SMBQ), effort–reward at work (ERI) or physical strenuousness of work. Self-reported work ability did not significantly differ for any of the intervention groups at baseline or at the 3-month follow-up. After 3 months, both intervention groups had significantly improved their work ability. The group with MD who received combined interventions had a higher prevalence of return to work (87%) at the 3-month follow-up compared with the group who received clinical intervention (77%) ($p=0.036$).

Association with return to work for patients with MD

The multiple logistic regression analyses showed that the demographic variables age, sex, education level and worries about private economy were not associated with return to work within 3 months. In model II, adjustments were made for return to work expectations, health measures, health resources, and work ability; no association with return to work was found. In model III, further adjustment was made for the type of intervention. Combined clinical and work-related intervention was associated with return to work within 3 months (OR 2.7, 95% CI 1.2–5.9).

Patients with MSD

For patients who had MSD and received a combined intervention, the educational level was higher ($p=0.005$), they were significantly younger ($p=0.008$), and they were on part-time sick leave to a higher degree ($p=0.004$) compared with those who received clinical intervention. Patients with MSD who received a combined intervention perceived their work at baseline as less physically strenuous ($p<0.05$) compared with those who received clinical intervention. There were no significant differences between the groups in measures of health (EQ-5D, EQ-VAS), mental functioning (SMBQ), physical functioning (FRI), social support (AVSI), self-efficacy (SES) or effort–reward imbalance at work (ERI). Self-reported work ability did not significantly differ between the groups at baseline or at the 3-month follow-up. After 3 months, both groups had significantly improved their work ability. The groups with and without combined intervention did not differ in prevalence of return to work within 3 months.

Association with return to work for patients with MSD

A multiple logistic regression analyses was performed and showed that the demographic variables age, sex, education level and worries about private economy were not associated with return to work within 3 months. In model II, adjustments were made for return to work expectations, health measures, health resources, and work ability. High return-to-work expectations (OR 2.4, 95% CI 1.2–4.8), better work ability (OR 1.2, 95% CI 1.1–1.4), and better self-rated health (EQ-5D) (OR 3.89, 95% CI 1.24–12.2) were significantly associated with return to work within 3 months. In model III, further adjustment was made for the type of intervention, which did not change the results of model II.

Evaluation of self-reported work ability and usefulness of interventions (study IV)

Study IV is based on a cohort of 810 patients where MSD was the most common diagnosis (499 patients, 62%). The MSD group was significantly older ($p<0.001$), included more men ($p<0.001$), and had a lower educational level ($p<0.001$) compared with patients with MD. White-collar professions were more common in the MD group (44%) than in the MSD group (18%), and blue-collar professions were less common in the MD group (14%) than in the MSD group (40%) ($p<0.001$). In the MSD group, 74% received full-time sickness benefit and in the MD group, 63% received full-time sickness benefit ($p<0.05$).

Three types of rehabilitation processes were identified; the analysis showed that 24% ($n=193$) were in the medical intervention group (MI), 45% ($n=368$) were in the clinical rehabilitation intervention group (CRI), and 31% ($n=249$) were in the WI category. The group who received work-related interventions in combination with medical or rehabilitative intervention modalities are referred to as the work-related intervention group (WI). Patients with MD were significantly more prevalent in the group who received WI compared with the two other intervention types ($p<0.001$).

Comparison of intervention groups

For MD patients, those who received WI were significantly younger compared with those who received MI: mean age for MI, 47 years (SD 11.7 years); for CRI, 44 years (SD 11.1 years); for WI, 42 years (SD 9.9 years) ($p<0.05$). Those who received WI also had higher education than the other two intervention types: MI, 30% with higher education; CRI, 30%; WI, 55% ($p<0.000$). White-collar professions were more common among those who received WI (60%) compared with those who received CRI (36%) or MI (24%) ($p<0.001$).

For MSD patients, those who received WI were significantly younger compared with those who received MI: mean age for MI, 50 years (SD 10.5 years); mean age for CRI, 48 years (SD 11 years); mean age for WI, 46 years (SD 10.3 years) ($p<0.05$). Those who received WI were also more educated than those who received CRI: MI, 17% with higher education; CRI, 15%; WI, 27% ($p<0.05$). Table 6 presents the distribution of medical intervention and rehabilitative intervention modalities and patients' judgement of specific usefulness. For patients with MD, medical treatment was more common compared with those with MSD ($p<0.05$). Patients with MD perceived

medical treatment ($p<0.001$) and medical investigations ($p<0.05$) as significantly more useful compared with patients with MSD. Among the six types of rehabilitative intervention modalities (RIMs), behavioural treatments were more common for patients with MD (65%) compared with those with MSD (10%) ($p<0.001$). Significantly more patients with MSD received exercise therapy/physical activities ($p<0.001$) and manual treatment ($p<0.001$). Health care advice was perceived as significantly more useful by patients with MD ($p<0.05$); there was no difference between the diagnostic groups in judgement of usefulness of all other RIMs. Significantly more patients with MSD received ergonomic advice compared with patients with MD ($p<0.001$). Ergonomic advice was mainly given at the clinic except for 6 patients who received ergonomic interventions by an ergonomist at the workplace.

Table 6. Frequency of intervention and judgement of specific usefulness of medical intervention modalities and rehabilitative intervention modalities, presented in diagnostic groups as percentages, frequencies (n), means and SD

Type of intervention	Frequency, % (n)		Level of significance	Specific judgement of usefulness of interventions ^a , mean (SD)		Level of significance
	MSD (n=499)	MD (n=311)		MSD (n=390)	MD (n=275)	
Type of medical intervention modalities						
Medical treatment	52 (257)	62 (192)	*	3.2 (1.2)	3.8 (1.0)	***
Medical investigation	34 (169)	30 (92)	n.s.	3.1 (1.2)	3.5 (1.2)	*
Other MI	6 (32)	6 (17)	n.s.	3.0 (1.4)	2.8 (1.2)	n.s.
Type of RIMs						
Health care advice	23 (113)	37 (116)	***	3.7 (1.2)	4.0(0.9)	*
Behavioural treatment	10 (51)	65 (202)	***	3.9 (1.2)	4.1(0.9)	n.s.
Exercise therapy/physical activity	41 (203)	7 (22)	***	3.8 (1.1)	4.0(0.8)	n.s.
Manual treatment	34 (170)	12 (37)	***	3.9 (1.0)	4.2(0.8)	n.s.
Ergonomic, equipment/orthosis	8 (39)	1 (3)	***	3.6 (1.1)	3.7 (1.1)	n.s.
Other RIMs	4 (21)	2 (5)	*	2.6 (1.3)	2.6(1.7)	n.s.

Levels of significance: * $p<0.05$; ** $p<0.01$; *** $p<0.001$

^aThe scale runs from 5 (very good) to 1 (very poor)

MSD, musculoskeletal disorders; MD, mental disorders; n.s. non-significant; RIMs, rehabilitative intervention modalities

Types of work-related interventions given are presented in table 7. The most common work-related intervention for both diagnostic groups was adjustment of work tasks/work environment (42–43%). Significantly more patients with MD received rehabilitation support (31%) compared with patients with MSD (18%) ($p<0.05$).

Table 7. Frequency of work-related interventions presented in diagnostic groups as percentages and frequencies (n)

Type of work-related intervention	MSD	MD	p-value
	Frequency, % (n)	Frequency, % (n)	
Ergonomic	23 (29)	2 (3)	***
Adjustments to work task/work environment	42 (53)	43 (53)	n.s.
Change of work task/employment	14 (17)	18 (22)	n.s.
Adaptation of working hours/organizational change	21 (26)	30 (37)	n.s.
Rehabilitation support	18 (23)	31 (38)	*

Levels of significance: * $p<0.05$; ** $p<0.01$; *** $p<0.001$.

Combination of Rehabilitative Intervention Modalities (RIMs)

Among the total population, 72% ($n=581$) received RIMs. Patients with MD received significantly more RIMs compared with patients with MSD (77% versus 68%, $p<0.01$). The frequency of receiving one, two, three or more RIMs was analysed for those patients who received RIMs. About half of the patients in both diagnostic groups received unimodal treatment (one type of RIM, MSD 48% and MD 53%). Significantly more patients with MD reported better effect of health care contacts on work ability with one or two RIMs compared with patients with MSD (one RIM, $p<0.05$; two RIMs, $p<0.05$). Thirty-six percent of the total study population received a combination of two or more RIMs.

Types of interventions and the patients' judgement of usefulness

Patient judgement of usefulness was analysed by comparing the medical intervention group (MI), the clinical rehabilitation intervention group (CRI), and the group who received work-related interventions in combination with medical or rehabilitative intervention modalities, referred to as the work-related intervention group (WI).

Among patients with MD, WI was perceived as more useful compared with the other two intervention types (WI versus MI, $p<0.001$ and WI versus CRI, $p<0.01$). Significantly more patients with MDs who received WI reported better effect of health care contacts on work ability compared with the other two intervention groups ($p<0.001$). For patients who had MSDs, no significant difference was found between the intervention types concerning judgement of overall usefulness of interventions, or for effect on work ability.

For patients with MDs, self-reported work ability at baseline was significantly better in the MI group compared with the other two intervention types (MI versus CRI, $p<0.05$ and MI versus WI, $p<0.01$). Self-reported work ability at 3-month follow-up was significantly lower for CRI compared with the other two intervention types ($p<0.001$ and $p<0.05$). The MD group improved their work ability most if they received WI ($p<0.05$). No significant difference in work ability at baseline was found for patients with MSD, and self-reported work ability at the 3-month follow-up was significantly worse for patients who received CRI compared with those who received WI ($p<0.001$). For patients with MD receiving WI, the overall reported usefulness of interventions was significantly better compared with patients with MSD receiving the same type of interventions (4.1 versus 3.5) ($p<0.001$). Patients with MD also reported significantly better usefulness of CRI compared with patients with MSD (3.8 versus 3.2) ($p<0.001$). The change in work ability was significantly better for patients with MD who received WI (3.2) compared with patients with MSD (2.2) ($p<0.001$). Significantly more patients with MD receiving WI (68%) reported that their intervention and contact with health care improved their work ability compared with patients with MSD (51%) ($p<0.001$).

Table 8. Summary of studies I–IV

	Study I	Study II	Study III	Study IV
Title of the paper	Is an expert diagnosis enough for assessment of sick leave for employees with musculoskeletal and mental disorders?	Clinical reasoning in occupational health services for individuals with musculoskeletal and mental disorders	Association between clinical and work-related interventions and return to work for patients with musculoskeletal or mental disorders	Evaluation of self-reported work ability and usefulness of interventions among sick-listed patients
Main focus	Compare self-reported work ability, work conditions, health and function between ICD-10 groups with MSD, MD and MSD+MD. Analyse variables associated with sick leave	Analyse association between professional assessment of patients main clinical problem and patients self-reported health and work status. Explore professional recommendation of interventions in relation to patient's characteristics	Explore what characterizes patients receiving clinical versus combined clinical and work-related interventions and factors associated with RTW	Investigate the relationship between type of intervention given, patient judgement of usefulness and the effect on self-reported work ability
Main findings	MSD: 44% MD: 22% MSD+MD: 34% Patients with MSD+MD reported more problems with mental functioning, had higher psychological demands at work and poorer work ability compared to those with MSD only. Being on sick leave was associated with poor work ability, reduced functioning and having MD and MSD+MD. Self-reported health and work measures can complement the expert-based diagnosis	Main clinical problem: Medical/organic: 39% Psychosocial: 46% Physical work-related: 15% There is an association between the professional biopsychosocial assessment and patients' self-reported measures of health, functioning and work ability. Psychosocial problems and activity limitations concerning social interaction skills are a frequent problem among patients with MSD and MD. This can be identified by using the PSFS	Three-quarters of newly sick-listed individuals return to work within 90 days, a subgroup of patients do not. For patients with MD, combined clinical and work-related interventions were associated with higher prevalence of RTW. For patients with MSD, high RTW expectations, better work ability, self-rated health were associated with RTW	Intervention type: MI: 24% CRI: 45% WI: 31% Unimodal rehabilitation was widely applied, 72% received at least one rehabilitative intervention. 36% of the total study population received a combination of rehabilitative interventions. One-third received WI. Among patients with MD, WI was reported as more useful compared with the two other intervention types

MI; medical interventions, CRI; clinical rehabilitative interventions, WI; Work-related interventions; MSD; musculoskeletal disorders, MD; mental disorders, PSFS, Patient-Specific Functional Scale; RTW; return to work

DISCUSSION

The overall aim of the study was to contribute to the development of the rehabilitation process by gaining better knowledge on biopsychosocial assessment and praxis behaviour in the early rehabilitation process for individuals with MSD and MD seeking occupational health services or primary health care. The main findings of the studies are discussed and presented in two major topics: (1) biopsychosocial assessment and (2) the early rehabilitation process. The discussion ends with methodological considerations, clinical implications and finally directions for future research.

Biopsychosocial assessment

The approach to assessment of health, functioning and work ability performed within health care is based on the view that disability should be understood and managed according to a biopsychosocial model. The importance of using this approach for assessment and management of human illness is strongly recommended in previous research (58, 81, 94, 122, 132). The professional biopsychosocial classification into main clinical problems corresponds well with the patients' self-reported health and functioning. The patient-reported outcome measures used in studies I and II represent biological, psychological and social dimensions of health and functioning from a patient's perspective. The findings in this thesis indicate that clinical assessment based on a biopsychosocial approach can be used to analyse patients' main clinical health and work-related problems as a basis for dialogue between the patient and health care professionals concerning recommended interventions.

The results also show that the recommendations of clinical and work-related interventions were associated with the professional assessment of the main clinical problem, educational level, work ability, social interaction skills and mobility. Adding the dimensions of main clinical problem and patient's self-reported measures can provide additional information and complement the medical classification to further understand the severity of the patient's problem and how the patient perceives their work ability. This may improve clinical reasoning and strengthen the inclusion of the patient's perspective.

As in our study, previous research has shown that self-reported reduced work ability has been linked to sick leave, poor health, poor functioning, and high physical and mental demands at work (22, 149, 228). High disability and severity are found to be associated with longer duration of sick leave for patients with MSD and for patients with MD, and might be an observandum in assessment of work ability (67, 80). In a study by Bethge et al. (228) self-reported poor work ability was associated with high job strain due to high demands and low control and also by effort–reward imbalance, and a recent study by Hultin et al. (229) showed that stress at work or problems in workplace relationships can reduce work ability and be a trigger for sick leave. Reduced work ability and lack of job control is also associated with loss of productivity (230). These results strengthen the importance of adjusting work demands since this can have an influence on employees' self-reported work ability. For men and among health care employees, Johansson et al. (164) found that few opportunities to adjust work to health influenced self-reported work ability negatively.

It is known that work ability decreases with age (22) and there is a need to increase work participation among older workers. It is highly debated in Sweden as well as in other western countries, if and how employers can increase flexible work options since governments have suggested increasing the retirement age. Older workers with reduced work ability are also a challenge for health services according to Ilmarinen (231) who propose better support for disabled older workers to promote work ability. In study II, we found that individuals who had physical work-related problems were significantly younger compared with the other groups with medical/organic or psychosocial problems. Furthermore, in the ReWESS study, we found that older age was related to receiving clinical interventions compared with receiving combined clinical and work-related interventions. Age is a factor to consider in the clinical assessment, and it is known from previous research that older age is associated with long-term sick leave among sick-listed employees (78, 79). Besides older age, Vlasveld et al. (200) found that moderate to severe depressive symptoms, high physical symptoms, high physical job demands and contact with medical specialists were associated with a higher risk for longer duration of sick leave.

Comorbidity of MSD and MD is more prevalent among older workers (231). Understanding problems related to comorbidity is highly relevant clinically. We found that individuals who sought health care with co-morbid conditions, having both MSD and MD, reported more problems with mental functioning according to the ZSDS, higher psychological demands at work according to the ERI questionnaire, and poorer work ability according to the WAI compared with those with MSDs only. Patients with co-morbid conditions also had worse outcome compared to having mental disorders only, but to a lesser extent. The findings in this study underscore the need to

address aspects of both mental and physical functioning, age, and aspects of work demands in clinical screening because being on sick leave was associated with having a diagnosis of MD, having co-morbid conditions with both MSD and MD based on a professional opinion and having poor work ability and physical functioning. In clinical assessment, screening for psychological symptoms might be valuable because overlap between pain and psychological symptoms is common. Thus, pain is a frequent symptom of many MDs, and depression and anxiety frequently accompanies musculoskeletal pain (114, 232). At first, patients might present somatic problems and physical complaints when visiting the clinic rather than referring to the problem as being psychological. This requires skills in clinical reasoning among health care professionals to recognize and analyse symptoms and problems from a broader perspective together with the patient (118, 119). Our findings are in line with previous research. In a literature review on upper limb disorders focusing on assessment, treatment and return to work (75), the authors found that individual psychological factors such as anxiety and depression were associated with a range of aspects of upper limb disorders and there is a need to address psychological and psychosocial aspects in treatment, coordinated among the actors involved in the rehabilitation. Even though evidence gaps exist, the authors conclude that biopsychosocial factors need to be addressed early because they influence upper limb complaints. Biopsychosocial models have increasingly been used to understand work disability and identify psychological and psychosocial risk factors of importance for return to work (81, 233), and are used in guidelines in the United Kingdom for management of long-term sickness absence (>4 weeks) (32). The importance of recognizing psychological and psychosocial factors are further emphasized in current guidelines on low back pain (124, 133). In our study, the predominance of psychological and psychosocial problems was expected because it is known that problems at work and personal psychological factors have been linked to both MSD and MD (108, 110, 160, 234). There is evidence for the role of psychological symptoms in the transition from acute to long-standing low back pain (234, 235).

We found that social interaction skills were a problem for many patients with MSD and MD. The PSFS can add new dimensions in understanding patients' activity limitations and is one way of assessing what activity limitations are perceived as problematic for the patient without a predefined list of areas. The assessment can clarify what dimensions of activity limitations are most affected and mirror the severity of the patient's health problem and the consequences on functioning and ability to perform activities. The activity limitation profile according to PSFS gives a more individualized self-report compared with standardized self-report instruments, supporting the interaction between patients and professionals, and strengthening the patients' opportunities to understand their problems. This is in line with a client-

centred problem-solving process presented by Shaw et al. (122) that emphasizes dialogue with patients to identify concerns about returning to work and overcoming work barriers. As well as being a basis for choice of treatment and for assessing outcome (134, 135, 236), self-reports are also used in combination with the medical history and clinical examination to identify patients with indications of serious illness, high risk of sickness absence, and poor outcome of intervention (32, 98, 122, 124, 236). However, specific knowledge is needed for health care professionals to interpret the results of self-reported measures and to use them in clinical praxis. The use of self-reported measures may give the patient a new active role in their contact with health care professionals and can provide the patient with more knowledge about their disorders (123). In conclusion, the PSFS adds new dimensions in the biopsychosocial assessment because it allows the patient to choose activity limitations of importance without predefining specific areas. The PSFS was developed for patients with different MSDs (218-220, 237) and needs to be further tested in other groups, as in this study. A future challenge is to implement and test the biopsychosocial approach of assessment further in a standardized manner within clinical praxis.

The early rehabilitation process

We found that three-quarters of sick-listed individuals with MSD or MD return to work within 90 days. However, the treatment approach for those who are sick-listed is still very medically and clinically oriented and involvement from employers in the rehabilitation process is rare. The findings suggest that increased focus on external environmental factors such as adjustments at work may be needed. Only about one-quarter of patients with MSD and less than half of the patients with MD received combined clinical and work-related interventions. The results presented in this thesis indicate a large variation in the rehabilitation process and the process may not be equal in practice for sick-listed patients with MSD and MD. The prevalence of work-related interventions was higher for those who were younger and had higher education. Furthermore, the type of intervention offered in the early rehabilitation process seemed to be influenced by factors such as patient's expectations, self-reported health and degree of sick leave.

A previous Swedish study presented by Heijbel et al. (169) showed similar results in a cohort of employees on long-term sick leave. They observed that less than half of the employees had been in contact with rehabilitation providers and stakeholders at the workplace. In an international comparison, it was found that work interventions were used sparingly for workers with low back pain in Sweden compared with other

countries. For example, 9–20% received work interventions in Sweden versus 8–60% in the Netherlands (66). Furthermore, a recent Swedish review by Burstrom et al. (62) found differences concerning access; for example, men, younger employees, those on long-term sick leave and those who were employed rather than unemployed were more likely to receive vocational rehabilitation. The importance of providing work-related interventions and adaptation of work for sick-listed patients with MD (86, 129, 157) and for patients with MSD (1, 60, 77, 181, 193) is underscored by previous research.

We found that receiving combined clinical and work-related interventions was associated with increased prevalence of return to work within 3 months for patients with MD. Individual factors, such as better health, positive return-to-work expectations and better work ability, were associated with return to work for patients with MSD. As shown in this study and suggested in previous research, personal and job-related factors should be taken into consideration when choosing interventions (200, 238). Some of these personal resources have been found to reduce sickness absence for MSD in previous studies (78, 80, 198, 201). Lindell et al. (198) showed that low total previous sick-listing, young age and positive expectations of return to work were predictive for return to work and are important considerations in clinical practice. However, the results are ambiguous because Anema et al. (66) found that patients' health characteristics only contribute somewhat to the explanation for return to work; job characteristics, receiving work interventions and compensation policies were more strongly related to sustainable return to work. Others have shown that pain intensity and heavy physical and mental work are the main significant factors for long-term sickness absence in MSD (70, 80). A study by Ekberg et al. (70) including patients with disorders in the neck and shoulders showed that individuals who are on long-term sickness absence (more than 101 days) perceived higher physical and mental loads in their jobs compared with those on short-term sick leave, underscoring the importance of increased attention to adjusting work conditions. According to Shaw et al. (103), work demands that are self-reported appear to be more predictive of disability duration than objective work assessment measures. We found that factors associated with return to work at the 3-month follow-up differed for the two patient groups with MSD and MD.

For patients with MD, the effect of receiving combined clinical and work-related intervention was greater than other prognostic factors for return to work. A recent study by Oostrom et al. (129) concluded that workplace intervention is only effective for those employees on sick leave due to distress who are motivated about returning to work. Present health status and return-to-work expectations are shown to influence the prognosis of returning to work (67, 78, 199). Karlsson et al. (86) also found positive effects of work-related interventions for patients with MD. Recently published studies

have identified other important prognostic factors associated with return to work for individuals with MD, and both health and work-related factors influence time to return to work (67, 79, 199). For example, long duration of the problem, prior mental problems, older age, somatization and high disability were negative predictors for return to work. It might be expected that the characteristics of individual health and work-related factors would influence the choice of intervention, but these factors were quite similar for patients with MSD in the intervention groups. Further analyses showed that within the group of patients with MSD, patients who received combined interventions were to a higher degree younger, had higher education and were more often on part-time sick leave. All these factors can be expected to influence a more successful return to work, which in part has been shown in previous studies of prognostic factors for duration of sick leave and return to work (78, 80, 198, 201). Choice of work-related interventions seems to be more influenced by these factors than by work-related factors. Irrespective of the type of intervention, the effect on return to work was the same. Part-time sick leave seems to increase access to work-related intervention, and as suggested by Sieurin et al. (34), it provides opportunities for employees with lower work ability to stay in work. Similar results were presented by Viikari-Juntura et al. (69) who found that early part-time sick leave provided a faster and more sustainable return to work, with increased possibilities of performing regular work duties compared with full-time sick leave. Factors of importance associated with return to work in the rehabilitation process can be identified within the personal system at all levels as well as within the health care and workplace systems.

Previous research suggests that employers should have an active role in adapting the workplace for sick-listed patients in order to enhance possibilities for sustainable return to work (53, 60, 93, 193), but this is not implemented for most patients according to our study. We found that for those who received work-related interventions, adjustments to work tasks or the work environment were the most prevalent interventions at the workplace for both diagnostic groups. This is in accordance with de Rijk et al. (239), who found that work modifications were commonly given to sick-listed patients with MSD and MD, and with van Oostrom et al. (129), who found that work design and reorganization were frequently used for distressed employees. We also found that rehabilitation support from the workplace, including support from the employer, workmates and other stakeholders, was given to a higher degree for patients with MD compared with patients with MSD. Previous research has shown that support from others is important in the process of returning to work (53, 157).

Interventions in the studies were evaluated by analysing types of interventions rather than evaluating a specific treatment approach given by a specific health care

professional, and different types of rehabilitation processes were compared in studies III and IV. The findings of this thesis show that medical interventions and unimodal rehabilitation were widely applied in the early rehabilitation process, but the type of treatment approach varied depending on the diagnosis. This is in line with previous research showing that health care utilization is high among sick-listed individuals and increases with severity of pain and disability (33, 90). The most common intervention for patients with MD was behavioural treatment (therapeutic conversation, cognitive therapy, body awareness). However, less than 10% of patients with MD received an active physical approach, a remarkably low prevalence given that physical exercise is known to improve patients' health and is recommended as a treatment strategy for depression (107, 180, 191). As pointed out by Martinsen (191), it is crucial to support individuals to take active responsibility for their own health. More patients with MSD received a physically active approach with exercise therapy/physical activity (40%), in line with recommendations in the research literature (186–189). Sjöström et al. (240) found that patients with MSD participating in a multidisciplinary rehabilitation programme considered physical activity a key factor in coping with pain when striving to get back to work. Furthermore, results of a meta-analysis (241) showed that patients with non-acute low back pain can benefit from exercise interventions to reduce days on sick leave. Specific behavioural treatment for patients with MSD seems to be underutilized in clinical praxis. This indicates that patients with MSD are not receiving interventions that are specifically targeted to increase their ability to cope with pain and their present life situation to any large extent. The effect of a cognitive treatment approach as well as tailored behavioural treatment and exercise-based physical therapy for patients with persistent MSD have been emphasized in previous research (127, 181, 182). Furthermore, patients reported that clinical rehabilitative interventions with a specific work focus were used infrequently.

In this thesis, no cost-effectiveness or cost-benefit analysis was performed. A study on the costs and benefits of interventions in relation to direct health care costs and costs due to absence from paid work remain a challenge for the future. It has already been proposed that a combination of intervention modalities may not always be necessary and it is more expensive than single intervention modalities for patients with back pain (242). Scientific evaluation of the economics relating to sick leave and interventions enhancing return to work is scarce and is presented in only a few studies (196, 243, 244). According to an English study by Squires et al. (245) focusing on long-term sickness absence, the analyses showed that interventions that led to even a small effect on increased return to work were likely to be cost-effective compared with other interventions. For example, Anema et al. (246) showed that sick-listed workers with subacute low back pain returned to work sooner if they received workplace interventions in addition to multidisciplinary rehabilitation compared with those who

received graded activity. The mean difference in sick leave duration was 27 days, showing that the intervention was cost-effective. In our study, about a quarter of the patients did not return to work within 90 days. This patient group, which is costly for society, might need special attention in the early rehabilitation process. Previous research suggests that subgroups of patients with a risk of poor outcome can be identified in clinical screening (38, 134–136), and it is known that both personal and work-related factors need to be considered to increase the possibilities of returning to work (79, 80, 200). From a positive perspective, the results showed that the majority of newly sick-listed patients do return to work within 90 days, although work ability is still reduced for most patients when returning to work. This merely shows that the likelihood of returning to work is influenced by many factors as reported in previous research (78–80, 233). There is an increased concern about problems related to sickness presence and some patients have an increased risk of becoming sick-listed again. Lötters et al. (76) showed that patients with chronic complaints measured at baseline and poor health status measured when returning to work had a higher risk for recurrent sickness absence. Gustafsson et al. (35) showed that, in a sample of working-age individuals, sickness presence was found to be associated with poor health, physical complaints, poor mental well-being, poor work ability and future sickness absence. These results highlight the need for further research into factors associated with sustainable return to work for individuals with MSD and MD. When analysing present praxis behaviour of the early rehabilitation process in Sweden as performed in our study, it appears that the medical interventions and clinical rehabilitative interventions were prioritized. From a patient perspective, employers are not providing work-related interventions to any great extent indicating that there is a gap between present praxis behaviour and what is recommended in the research literature.

We studied patients' judgements on the usefulness of early interventions in the rehabilitation process and patients with MD were analysed separately from patients with MSD. The main findings were that patients with MD who received a combination of work-related interventions and clinical interventions reported best usefulness of interventions and best effect of health care contacts on improved work ability. This was not found to be significant for patients with MSD. The results indicate differences between patients with MSD and MD in how rehabilitation processes are perceived. This innovative question, asking patients for their judgement of usefulness, specifically in relation to how interventions influence work ability, can be valuable because improvement in work ability and health is a common goal and a prerequisite for return to work. Since the goal is improved work ability, we wanted to capture the patients' views of interventions related to their own report of work ability. In our study, the results may reflect that the expectations of improved work ability were met

to a higher degree for patients with MD. Previous studies have shown that patients' treatment satisfaction may be related to expectations, preferences and adherence to treatment (177, 179, 184). As patients with MD were more often on part-time sick leave, work-related interventions might be given at an earlier stage than for patients with MSD. More patients with MD were also given work-related interventions compared with patients with MSD.

We found that the change in self-reported work ability using the single WAI item "current work ability compared with lifetime best" was perceived better for patients with MD compared with patients with MSD when receiving work-related interventions. The reasons why patients with MSD in our study did not perceive the same usefulness of work-related interventions as patients with MD might be a reflection of a more severe health condition as found in study III. Improvement in work ability was lower and they had more physically demanding work conditions in another occupational sector than patients with MD. Furthermore, work modifications that require more preparation and have a larger impact seem to be more often applied later in the return to work process (239). Carroll et al. (193) concluded in a review that not all interventions involving the workplace are effective for patients with MSD. Appropriate work modifications involving active collaboration between employee, employer and occupational health practitioners seems to be most effective for helping individuals with back pain on long-term sick leave go back to work. Previous research based on patients' experiences have shown that support and adjustment at the workplace is a facilitating prerequisite for returning to work and staying at work (53, 54, 157). Interventions at the workplace can be used to describe both preventive and rehabilitative measures, and there is evidence supporting the value of workplace health promotion when measuring well-being, work ability and sickness absence (137, 247).

Recently, Kuoppala et al. (247) presented the so-called "job well-being pyramid", a model of the working environment and its relationship with employee health. The pyramid contains aspects of the job and work environment, work ability, and action. Workplace health promotion includes both preventive and rehabilitative measures integrated in a process over time. Workers' health and work ability varies throughout working life and is influenced by job-related circumstances such as support from employer, job balance and receiving preventive and rehabilitative measures at the workplace. In a Swedish study by Larsson et al. (248) focusing on factors promoting work ability and self-efficacy among employees working in health care, they found that work ability was positively associated with; higher perceived personal safety, stronger safety climate, higher self-efficacy, musculoskeletal wellbeing as well as younger age and longer seniority. Although, explanatory variables of work ability varied between assistant nurses and care aides.

When analysing the patients' judgement of the usefulness of each intervention specifically, we found that patients with MD reported better usefulness of medical treatment and health care advice compared with patients with MSD. However, previous research has shown that only a minority of patients with depression seeking primary health care prefer medication; most prefer individual counselling (126, 178). In a study by Stein et al. (179), receiving psychosocial care was found to be associated with higher satisfaction with mental health care for patients with anxiety disorders. In our study, patient judgement of usefulness was higher when evaluating clinical rehabilitative interventions compared with medical interventions. Patients' judgement of usefulness was high among those patients included in our study who received behavioural treatment (therapeutic conversation, cognitive therapy, body awareness). In addition, among patients who received a physically active approach or manual treatment, patients' judgement of usefulness was positively rated. A population-based survey by Leijon et al. (174) indicates that persons in most need of increased physical activity appreciate and expect to receive support from health care professionals to increase their activity level.

Manual treatment was given to one-third of patients with MSD and the perceived usefulness was high. Manual treatment is widely accepted as a treatment strategy for patients with back pain in clinical praxis and is recommended in clinical guidelines in most western countries (124, 133), although there is not enough evidence to recommend one form of manual therapy over another. Evidence supporting manual treatment/spinal manipulation as a single treatment strategy for return to work is scarce (92, 172). It is suggested that manual treatment should be combined with exercise-based treatment and a cognitive treatment approach. Less than 10% of patients with MSD were given ergonomic advice/orthosis provided by health care professionals, and just a handful of patients were given ergonomic intervention by health care professional at the workplace. Considering the effect that ergonomic interventions may have on return to work and functional status (60, 74, 181, 196), and the reported usefulness found in our study, it was used sparingly in the early rehabilitation process.

When studying the usefulness of interventions in the early rehabilitation process, we found that access to clinical rehabilitative interventions was high and the specific perceived usefulness was good, but a multimodal treatment approach was rare; only one-third received a combination of at least two clinical rehabilitative interventions and only one-third received work-related interventions. In the ReWESS study, the majority of patients were recruited from primary health care, which may partly explain why receiving work-related interventions were not more prevalent. A study by Anema et al. (155) found that general practitioners mainly prescribed medical interventions for patients sick-listed due to MD and seldom discussed work conditions or applied work-

related interventions, whereas occupational physician had a stronger work focus and mainly applied work-related interventions. Increased occupational focus in early treatment of MSD and MD is suggested in a Finnish study by Ikonen et al. (91) because MSD and MD are often caused by work. In Sweden, the role of occupational health services is mainly to provide work-related interventions, whereas primary health care provides medical and rehabilitative interventions at the clinic. Nevertheless, it is the employer's responsibility to provide adjustments at the workplace in Sweden to optimize work participation for their employees.

There is evidence supporting that multidisciplinary interventions have an effect on return to work for people on sick leave due to back pain (92, 249) and for patients on long-term sick leave with mainly MSD and MD (151). However, evidence on the effect of multidisciplinary interventions for patients with neck pain is lacking (92), and the evidence base is also scarce for patients with MD. The evidence on a unimodal treatment strategy with regard to effect on return to work is limited (92, 154, 171, 172), and more research is needed. Our results might reflect the fact that resources for health care professionals working together are limited. In Sweden, rehabilitative interventions do not have to be prescribed by physicians; patients can seek different registered health care professionals on their own initiative, which makes it more likely that interventions in the rehabilitation process are not coordinated by health care professionals from one health care unit.

The interventions perceived as useful, only partially matches the interventions patients actually receive in the early rehabilitation process. Efforts are needed to implement strategies for increased equal access to work-related interventions, increased use of physical activity as a treatment approach for patients with MD and behavioural treatment for patients with MSD. Within a systems-based approach, the biopsychosocial model considers medical/biological, psychosocial, environmental, and ergonomic factors (81). According to this reasoning, we found that reported interaction among medical, psychosocial, ergonomic, and system-based factors seems to be lacking in the rehabilitation process, which implies that the rehabilitation process needs to adopt a broader perspective.

Methodological considerations

The cross-sectional design used in studies I and II has some limitations that must be considered when interpreting the results and does not guarantee generalizability for all employees with MSD and/or MD who seek care. We used a convenience sample,

which mainly consisted of female employees working in the public sector and with long-standing symptoms. Although the recruitment strategy might be a weakness of the cross-sectional study, its strength lies in the use of both professional and standardized self-reported measures for analysing patterns of health and work, sick leave and recommended interventions for 210 individuals with MSD and/or MD. A strength in the design was that the professional assessments were performed blinded to the patient-reported outcome measures, except for the PSFS, which requires a dialogue between the physiotherapist and the patient. The size of the population was chosen on the basis of having at least 30 study subjects in each subgroup in order to analyse possible differences between the groups as performed in the studies. Few clinical studies have included patients with both MSD and MD, mainly because they have different kinds of health-related problems. Causes of sick leave may differ and the interventions need to be given according to the patient's symptoms, needs, and life and working conditions. However, these two groups represent the most common causes of sick leave; they are frequent visitors to health care and factors associated with longer duration of sickness absence overlap (78, 200). From a patient perspective, the sick leave process has similarities no matter what the diagnosis is, challenging for health care providers and employers to handle together with the sick-listed person (53, 200).

In this thesis, the four studies included more women than men, which might reflect that women are known to use health care services more often than men (250). In addition, the prevalence rate for MSD and depression is known to be higher for women (88, 95, 113). Women have a higher risk of being sick-listed compared with men, and being a woman with MSD is associated with increased risk for long-term sickness due to MSD compared with men (80, 251). In study III, we found that the gender distribution was similar with regard to the type of intervention given in the early rehabilitation process. Future studies should include more men in order to make supplementary analyses of gender differences because there are biological differences and work and life conditions may differ for men and women (29, 50–52). Another aspect to consider in the cross-sectional study is that the majority of the study population worked within the public sector, which limits generalizability to other job sectors such as industry or manufacturing.

The strength of studies III and IV was the longitudinal prospective design, with a strong recruitment strategy based on a representative sample of newly sick-listed individuals defined by ICD-10. The newly sick-listed were recruited from a majority (39 units) of the primary health care centres in the county of Östergötland, Sweden, and from five occupational health service units. Östergötland has about 450,000 inhabitants and is representative of Sweden socio-economically. Our findings can be generalized to the Swedish working population at large and can be considered to have

high external validity. In return to work research, self-reported work disability and duration of sick leave are frequently used outcomes (60, 151, 181). Other commonly used sources to register length of sick leave and time until return to work are company payrolls (38), registers at the occupational health service unit (200) and the Social Insurance Agency's register (29). We used self-reported measurement of at least part-time return to work as the primary outcome versus not returning to work. Further analyses are needed to understand whether these patients were stable in their return to work; this has also been recommended in other research (194). Returning to at least part-time work has positive consequences for the patients (34), although in most countries part-time sick leave is rare. The severity of patients' health problems was looked at from a patient perspective by using self-reported measures of health, mental and physical functioning and work ability, providing a more nuanced understanding of the patient's condition, but self-reported measurement might be criticized. Earlier studies have found good agreement on self-reported data from employer and register information on sickness absence (252), and between self-reported data on sickness absence days and employers' registers for the same period (253).

Based on previous research, we used the single item "current work ability compared with lifetime best" for measurement of work ability in studies III and IV (149, 150), and the complete WAI was used in studies I and II. Alavina et al. (149) found that all of the separate scales in the WAI had predictive power for future disability with the highest influence of current work ability in relation to job demand. Improvement in work ability is commonly used as an outcome measure for evaluating return to interventions (1, 151). Most of the measurements used in the studies are well validated and have been used previously in research on individuals with MSD and/or MD. However, not all of the measurements were standardized. On the one hand, a weakness of studies III and IV was the use of non-standardized self-reported measures for evaluating the type and usefulness of interventions. On the other hand, we wanted to capture the patient's perspective of usefulness related to work ability and interventions given in the rehabilitation process. Therefore, a follow-up questionnaire specifically designed for the research questions and focusing on which patients received what type of intervention was used. The best level of evidence to evaluate the effect of interventions is to use a randomized controlled trial as a study design. In study IV, the patients were specifically asked about the effect on work ability due to health care contacts on a 5-point scale and therefore the results were presented as patients' perception of the effect on work ability, which may be used as an indication of patients' judgement. Further studies are needed to explore more precisely what work-related interventions are perceived as useful for the patients in their rehabilitation process.

The design of the studies entailed no treatment risk or consequence for the study subjects. A negative aspect may have been the time it took to answer the questionnaires included in the studies. The questionnaires contained several questions and, for an individual with reduced mental functioning, this might have been too demanding, and might be a reason for not returning the questionnaire and participating in the study. However, the response rate in the ReWESS study can be considered to be acceptable (approximately 70%). In studies I and II, no analysis of those who did not want to participate in the study was performed; only six subjects were registered as turning down the offer to participate. Future studies need improved and more standardized registration of exactly how many individuals seek care during the study period and how many deny participating. The use of health care professionals to ask individuals who seek care to participate in the clinical studies and having supportive management at the primary health care or occupational health service unit enhanced the recruitment process in our studies.

Clinical implications

The findings of this thesis indicate that clinical assessment of individuals with MSD and/or MD who seek care, based on a biopsychosocial approach, can be used to address health-related, personal, and work-related aspects by using a combination of professional judgement and patient judgement. The PSFS adds new dimensions to the biopsychosocial assessment because it allows the patient to choose important activity limitations without presenting predefined areas. Increased focus on social interactions seems to be of great importance to the patients. The biopsychosocial approach needs to be implemented and tested further in clinical praxis.

A clinical implication of our findings is that employers, health care professionals, and other stakeholders involved in the early rehabilitation process needs to adopt a broader perspective for sick-listed patients to include patients' individual health-related needs and aspects of employment and work conditions. Efforts are needed to implement strategies for increased equal access to work-related interventions, increased use of physical activity as a treatment approach for patients with MD and behavioural treatment for patients with MSD. As shown in this thesis, analysing self-reported health, functioning, work ability, expectations and work measures can be valuable factors to better understand return to work. This knowledge might be helpful for clinicians to identify those at risk for not returning to work in the early rehabilitation process versus those who have a good prognosis of return to work. Having a dialogue with the patients about their expectations for return to work in clinical assessment can

be helpful to understand how patients perceive their prerequisites for return to work, and may influence the choice of interventions. Incorporating measures based on patient-reported usefulness of interventions and the effect on work ability seems to be valuable in the management of patients with MSD and MD. It is proposed that health care professionals should use scientific evidence to support decisions in clinical reasoning. And as suggested, evidence-based practice (EBP) includes both perspectives of patients preferences, clinical expertise, and the use of best available evidence. In general, a prerequisite for implementing evidence-based methods besides providing education for health care professionals is to find practical, economical and technical solutions that support development in clinical praxis.

Future research

The results from this thesis provide some new knowledge about the early rehabilitation process and that access to work-related interventions is important to many patients. Reported usefulness of behavioural treatment, exercise therapy/physical activity and manual treatment was high but seldom used in combined treatment strategies. Further evaluation is needed to incorporate the type, the amount and duration of interventions given in the rehabilitation process. Future studies should strive to explore praxis behaviour comprising preferences of interventions not only from the patients' perspective but also from the employers' perspective. A future challenge is to assess who needs medical interventions, rehabilitative interventions, and work-related interventions, and who needs a combination of these interventions using a multimodal approach, and to evaluate whether it is cost-effective or not. More research is needed to understand the factors that predict return to work in the long term. It remains a challenge to understand who needs what type of intervention.

The next step is to implement knowledge gained from this thesis in clinical praxis. It would be of great interest to study the implementation process of increased use of standardized health and work measures in clinical assessment based on a biopsychosocial approach. Primary health care, occupational health services and the workplace are key arenas. Prioritized research questions are to identify and study the barriers and facilitators for access to work-related interventions and to clinical rehabilitative interventions, and how to implement and stimulate better use of interventions that promote return to work and optimize work participation and health-related quality of life for care-seeking individuals.

CONCLUSIONS

Biopsychosocial assessment

- There is an association between professional biopsychosocial assessment and patients' self-reported measures of health, functioning and work ability. Self-reported health and work measures can complement the expert-based diagnosis.
- Patients who had co-morbid conditions with musculoskeletal and mental disorders reported more problems with mental functioning, had higher psychological demands at work and poorer work ability according to the Work Ability Index compared with those with musculoskeletal disorders only. Patients with co-morbid conditions also had worse outcome compared to having mental disorders only. This underscores the need to address aspects of both mental and physical functioning, and assess aspects of work in clinical screening.
- Psychosocial problems and activity limitations concerning social interaction skills were a frequent problem among patients with musculoskeletal disorders and mental disorders. This can be identified in clinical screening by physiotherapists in dialogue with the patient using the Patient-Specific Functional Scale.

Praxis behaviour in the rehabilitation process

- Three-quarters of newly sick-listed individuals return to work within 90 days, but a subgroup of patients do not. This indicates the importance of identifying those who are at risk for long-term sick leave in clinical assessment.

- The treatment approach to sick-listed individuals is still very medical and clinically oriented. Access to work-related interventions seems to be limited in the early rehabilitation process and may not be equal in practice. Those who were younger, had higher educational level and reported stronger health resources were favoured. In the rehabilitation process, there is a need to strive for access to work-related interventions.
- There seems to be a gap between scientific evidence and praxis behaviour in the rehabilitation process. Unimodal rehabilitation was widely applied in the early rehabilitation process, a multimodal treatment approach was rare and only one-third received work-related interventions.
- For patients with musculoskeletal disorders, behavioural treatment seems to be underutilized in clinical practice considering the effect it may have on developing coping strategies and reducing symptoms.
- In order to meet the recommendations in guidelines, physical activity needs to increase as a treatment strategy for patients with mental disorders.
- Receiving combined clinical- and work-related interventions was associated with increased prevalence of return to work within 90 days for patients with mental disorders. Individual factors, such as better health, positive return-to-work expectations and better work ability, were associated with return to work for patients with musculoskeletal disorders.

Usefulness of interventions

- Patients with mental disorders who received a combination of work-related and clinical interventions reported best usefulness and best effect of health care contacts on work ability. Patients with musculoskeletal disorders did not perceive as good usefulness.
- Patients with mental disorders perceived better usefulness of medical interventions and health care advice compared with patients with musculoskeletal disorders. Patient in both diagnostic groups perceived high usefulness of behavioural treatment, physical activity or manual treatment but these were seldom used as combined treatment strategies. What patients perceive as useful interventions and what they actually receive only partially match.

SUMMARY IN SWEDISH

Rehabiliteringsprocessen för individer med muskuloskeletala besvär och psykisk ohälsa - Utvärdering av hälsa, funktion, arbetsförmåga och återgång till arbete.

Muskuloskeletala besvär och psykisk ohälsa är vanligt förekommande bland individer i arbetsför ålder. Dessa problem är vanliga anledningar till att söka vård och de främsta orsakerna till sjukskrivning i Sverige liksom i många andra industrialiserade länder. Försämrad hälsa och funktionsförmåga samt nedsatt arbetsförmåga är vanligt i dessa grupper. Rehabiliteringsprocessen för individer som söker vård kan beskrivas som ett samarbete mellan olika aktörer över tid, där åtgärderna syftar till att ge bättre hälsa, ökad arbetsförmåga och en ökad delaktighet i arbetslivet. Patienters upplevelser av rehabiliteringsprocessen och deras rapporterade nytta av åtgärder kan bidra till att förbättra insatser från vården och även insatser på arbetsplatsen. Forskning kring den tidiga rehabiliteringsprocessen för individer med muskuloskeletala besvär och psykisk ohälsa är dock begränsad. Det övergripande syftet med avhandlingen var att öka kunskapen om biopsykosocial bedömning av hälsa, funktion och arbetsförmåga för individer med muskuloskeletala besvär och/eller psykisk ohälsa som söker vård. Ett annat syfte var att få bättre förståelse för klinisk praxis i rehabiliteringsprocessen för sjukskrivna patienter genom att utvärdera självrapporterad arbetsförmåga, typ av åtgärder, nytta av åtgärderna samt rapporterad återgång till arbetet.

Avhandlingen baseras på fyra delstudier där patientens perspektiv står i fokus. För studie I och studie II användes en tvärsnittsdesign, där 210 individer som sökte företagshälsovård för muskuloskeletala besvär och/eller psykisk ohälsa inkluderades. Datainsamlingen bestod av enkäter som baserades på självrapporterad hälsa, funktion, arbetsförmåga, arbetssituation, samt professionell bedömning av diagnos, huvudsakligt kliniskt hälsorelaterat problem, rekommenderade åtgärder och sjukskrivning. Studie III ($n=699$) och studie IV ($n=810$) baserades på en longitudinell kohortstudie, ReWESS, med 3 månaders uppföljning. Den inkluderade individer som sökte primärvård eller företagshälsovård i Östergötland för muskuloskeletala besvär eller psykisk ohälsa och som sjukskrivits av läkare. Datainsamlingen innefattade upprepade frågeformulär till patienterna med avseende på självrapporterad hälsa, funktion, arbetssituation, arbetsförmåga, förväntan på återgång till arbete, typ av åtgärd och upplevd nytta av åtgärderna samt rapporterad återgång till arbete. I tvärsnittsstudien tyder resultaten på att det finns överensstämmelse mellan den professionella biopsykosociala bedömningen av patienternas besvär och patienternas självrapporterade mått på hälsa,

funktion och arbetsförmåga. Individer som hade samsjuklighet med muskuloskeletala besvär och psykisk ohälsa hade högre psykologiska krav i arbetet, högre grad av psykiska besvär och lägre självrapporterad arbetsförmåga jämfört med dem som endast hade muskuloskeletala besvär. Individer som hade samsjuklighet måste även sämre än dem som endast hade psykiska besvär. Studierna tyder på att psykosociala faktorer har stor betydelse vid bedömning av arbetsförmåga. Förmågan till social interaktion var ett vanligt förekommande aktivitetsproblem för majoriteten. Detta kunde identifieras av sjukgymnaster i dialog med patienten utifrån instrumentet Patient-Specifik Funktionell Skala. Användningen av frågeformulär kan vara ett komplement till den kliniska bedömningen och ge en ökad förståelse vid kliniskt resonerande för hur individen uppfattar sin hälsa, funktion, arbetsförmåga och arbetsförhållanden.

Den longitudinella studien visade att tre fjärdedelar återgick till arbetet inom 90 dagar. Åtgärderna var i huvudsak medicinskt och kliniskt inriktade. Tillgång till arbetsrelaterade insatser tycks vara begränsad i den tidiga rehabiliteringsprocessen och resultaten tyder på att processen inte är jämlik. De som var yngre, hade högre utbildningsnivå och bättre hälsorelaterade resurser gynnades. För patienter med psykisk ohälsa var tillgång till kombinerade kliniska- och arbetsrelaterade åtgärder associerat med återgång till arbetet. För patienter med muskuloskeletala besvär förklarades återgången till arbete av bättre hälsorelaterad livskvalitet, högre positiv förväntan på återgång till arbete, samt bättre arbetsförmåga. Studien indikerar att faktorer som förklarar återgång till arbetet kan identifieras med hjälp av självrapporterade mått. Patienter med psykisk ohälsa som fick en kombination av arbetsrelaterade och kliniska åtgärder rapporterade störst nytta och bäst effekt på arbetsförmågan av den insats de fått av vården. Patienter med muskuloskeletala besvär rapporterade inte lika god nytta. Resultaten tyder på att den forskningsbaserade kunskapen om åtgärder för att främja återgång till arbete inte implementerats till fullo i klinisk praxis i rehabiliteringsprocessen: unimodal rehabilitering erhöles i stor utsträckning, en multimodal behandlingsstrategi förekom sällan och bara en tredjedel fick arbetsrelaterade insatser. För patienter med muskuloskeletala besvär tycks beteendeorikta åtgärder vara underutnyttjade med tanke på den effekt sådan behandling kan ha för att utveckla copingstrategier och minska symtom. För patienter med psykisk ohälsa saknades oftast fysisk aktivitet som behandlingsstrategi vilket rekommenderas i riktlinjer och i nyare forskning. En klinisk implikation är att rehabiliteringsprocessen behöver anamma ett bredare biopsykosocialt perspektiv där både individuella hälsorelaterade behov och aspekter av arbetsförhållanden värderas vid bedömning och vid val av åtgärder. Utmaningen består i att förstå vem som behöver vilken typ av åtgärd. Det förefaller som om det biopsykosociala synsättet behöver implementeras och beforskas vidare i den tidiga rehabiliteringsprocessen.

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