

From the DEPARTMENT OF CLINICAL NEUROSCIENCE
Karolinska Institutet, Stockholm, Sweden

**RETURN TO WORK AFTER LONG-TERM SICK LEAVE:
BARRIERS AND FACILITATORS**

Bodil Heijbel



**Karolinska
Institutet**

Stockholm 2012

All previously published papers were reproduced with permission from the publisher.

Published and printed by Karolinska University Press
Box 200, SE-171 77 Stockholm, Sweden

© Bodil Heijbel, 2012
ISBN 978-91-7457-810-2

To María and Sven

*Det intressanta är inte vilken sjukdom en
människa har utan vilken människa det är
som har sjukdomen*

Hippokrates

ABSTRACT

Background: Musculoskeletal and psychiatric disorders are the dominating problems and disorders among people on long-term sick leave in all developed countries. From 1997 up to an all time high in 2002, there was a considerable increase in the number of people on long-term sick leave in Sweden.

Aim: The overall aim of this thesis was to investigate people on long-term sick leave in order to find factors that promote or hinder the return to work process.

Specific aims were: to describe the medical reasons for sick leave, the duration of the problems and of the ongoing spell of sickness absence, the rehabilitation support and the individuals' own expectations of their future return to work (Study I); to investigate whether the predictions of people on long-term sick leave concerning their future RTW had an impact on their return to work (Study II); to describe the frequency of full, partial and no RTW after long-term sick leave, and to investigate the influence of psychosocial work conditions, work ability and health, reported before the onset of sick leave, on full and partial RTW respectively (Study III); to describe the experience of driving and implementing a workplace-based rehabilitation intervention with good access to rehabilitation measures, to find out which people multimodal and/or vocational rehabilitation was advocated for and to find predictors of return to work (Study IV).

Material and methods: All the studies included are sub-studies of the longitudinal HAKuL study (Work and Health in the Public Sector in Sweden), which was launched in 1999. The studies were conducted in four county councils and in local authorities in six municipalities in Sweden. Main occupational groups were registered nurses, assistant nurses, home-based personal care workers in elderly care, employees at childcare centres, administrative personnel, and teachers. The majority, 81%, were women. Study I is a cross-sectional descriptive study with an 18-month follow-up (Study II). Studies III-IV are longitudinal and conducted over a period of three years with a two-year follow-up.

Results - barriers and facilitators of the return to work: The perception of the individuals on long-term sick leave regarding their RTW had a very strong predictive value for real RTW (OR=8.28, 95% CI: 3.31 - 20.69). Other factors found that were predictive of return to work in Study II were: being aged between 45-54 years; having been on the sick list for less than one year; having less pain than those in the quartile with most pain; feeling welcome back to work. In Study III, predictive factors found for full RTW were: low job strain according to the model of Karasek and Theorell (low demands-high decision latitude); good general health before the onset of sick leave; physical and mental demands in balance with the individual's capacity. Negative consequences of organisational changes gave decreased odds for full RTW. Predictive factors for partial RTW were low job strain and good general health. In the interventional study, Study IV, vocational rehabilitation, being under 45 years of age and low physical demands at work were found to be predictive of RTW.

Other results:

Study I: Musculoskeletal and psychological/stress-related problems were, as expected, the most usual causes of long-term sickness absence for 90 days or longer. Combinations of symptoms and disorders were common. The women had experienced their symptoms for six years

(median) before the start of their sickness absence and the men for seven years. Twenty-three percent of the women and 24% of the men did not feel welcome back to work. Personal contact and support by the regional social insurance officers were lacking for one third of the sick-listed people. Half of them had no contact with the occupational health service or the trade union.

Study III: Two years after the onset of sick leave, 77% had returned to work, 62% full-time, 15% part-time, and 23% were still not working. Part of the full-time returners, 21%, had returned via a period of partial working time, while 41% had returned directly from full-time sick leave to full-time work. The proportion of partial RTW increased with age.

Study IV: Problems were encountered at the beginning of the intervention. There were considerable obstacles in adapting the existing computerised personnel administrative systems to give a signal at 28 days of sick leave and the OHS sometimes had lack of resources. To counteract these problems the project organisation sent weekly reminder emails to the supervisors, the OHS were compensated at weak points, and feedback was given to those involved. After a check-up against the salary system, the decision was made to only include people with spells of sick leave of 90 days or more. Vocational rehabilitation was advocated for those with stress-related/psychological problems who were younger than 55 years of age. People with musculoskeletal problems had difficulties resuming work, despite the fact that they often received both multimodal and vocational rehabilitation.

Conclusion: The most important finding in this thesis is the impact of the sick-listed individuals' own perception of their future RTW. Only one question is required and it is essential to find out if the answer is yes or no in order to tailor rehabilitation measures. Supervisors, OHSs and employers have important roles in detecting psychosocial work conditions at work in order to prevent long-standing work strain and long-term sick leave. It is of great importance that people with musculoskeletal problems are taken seriously early on. When they are finally on long-term sick leave, considerable efforts are needed to help them resume work. Vocational rehabilitation is a favourable treatment for people with stress-related/psychological problems. Part-time sick leave often functions as part of the rehabilitation process and can enhance full RTW. Interventions at workplaces are difficult to accomplish. The structures and efforts must be considered in advance.

Keywords: Sick leave, sickness absence, return to work, multimodal, rehabilitation, vocational, workplace intervention, occupational health, supervisor, musculoskeletal, stress-related, physical workload, demand, control, strain, own perception.

LIST OF PUBLICATIONS

- I. Employer, insurance, and health system response to long-term sick leave in the public sector: policy implications.
Heijbel B, Josephson M, Jensen I, Vingård E.
J Occup Rehabil. 2005 Jun;15(2):167-76.
- II. Return to work expectation predicts work in chronic musculoskeletal and behaviour health disorders: prospective study with clinical implications.
Heijbel B, Josephson M, Jensen I, Stark S, Vingård E.
J Occup Rehabil. 2006 Jun;16(2):173-84
- III. Influence of self-reported work conditions and health on full, partial and no return to work after long-term sickness absence
Josephson M, Heijbel B, Voss M, Alfredsson L, Vingård E.
Scand J Work Environ Health. 2008 Dec;34(6):430-7.
- IV. Implementation of a rehabilitation model for employees on long-term sick leave in the public sector: difficulties, countermeasures and outcome.
Heijbel B, Josephson M, Vingård E.
Submitted

TABLE OF CONTENTS

| | | |
|----------|--|-----------|
| 1 | INTRODUCTION | 1 |
| 2 | BACKGROUND | 2 |
| 2.1 | THE GLOBAL BURDEN OF MUSCULOSKELETAL AND PSYCHIATRIC DISORDERS | 2 |
| 2.2 | SICKNESS ABSENCE IN SWEDEN | 2 |
| 2.3 | DISORDERS ASSOCIATED WITH LONG-TERM SICK LEAVE IN SWEDEN | 4 |
| 2.4 | CONSEQUENCES OF SICK LEAVE | 5 |
| 2.5 | THE IMPACT OF DEPRESSION | 5 |
| 2.6 | NUMEROUS DETERMINANTS OF RTW OUTCOME | 6 |
| 2.6.1 | THE RETURN TO WORK PROCESS | 6 |
| 2.6.2 | PERSONAL SYSTEM – RETURN TO WORK AS BEHAVIOUR | 7 |
| 2.6.3 | THE HEALTHCARE SYSTEM | 10 |
| 2.6.4 | THE WORKPLACE | 13 |
| 2.6.5 | LEGISLATION WITHIN THE NATIONAL INSURANCE ACT | 13 |
| 2.6.6 | COOPERATION AND INTERACTION BETWEEN STAKEHOLDERS | 14 |
| 3 | AIMS | 15 |
| 4 | MATERIAL AND METHODS | 16 |
| 4.1 | STUDY DESIGN | 16 |
| 4.2 | THE HAKUL STUDY | 16 |
| 4.3 | SUBJECTS | 17 |
| 4.3.1 | STUDY I | 17 |
| 4.3.2 | STUDY II | 18 |
| 4.3.3 | STUDIES III AND IV | 18 |
| 4.4 | METHODS | 19 |
| 4.4.1 | STUDIES I AND II | 19 |
| 4.4.2 | STUDY III | 20 |
| 4.4.3 | STUDY IV | 21 |
| 5 | RESULTS | 23 |
| 5.1.1 | STUDY I | 24 |
| 5.1.2 | STUDY II | 24 |
| 5.1.3 | STUDY III | 25 |
| 5.1.4 | STUDY IV | 26 |
| 6 | DISCUSSION | 29 |
| 6.1 | RESULTS | 29 |
| 6.1.1 | PHYSICAL PREDICTIVE FACTORS FOR RTW | 30 |
| 6.1.2 | PSYCHOLOGICAL PREDICTIVE FACTORS | 32 |
| 6.1.3 | SOCIAL FACTORS | 32 |
| 6.1.4 | PSYCHOSOCIAL FACTORS AT WORK | 33 |
| 6.1.5 | REHABILITATION | 34 |
| 6.2 | METHODOLOGICAL CONSIDERATIONS | 35 |
| 6.2.1 | GENERAL METHODOLOGICAL CONSIDERATIONS | 35 |
| 6.2.2 | METHODOLOGICAL CONSIDERATIONS CONCERNING THE REHABILITATION INTERVENTION | 36 |

| | | |
|--------------|---|-----------|
| 6.3 | GENERAL DISCUSSION | 37 |
| 6.3.1 | PARTIAL SICK LEAVE | 37 |
| 6.3.2 | TIME ASPECTS | 38 |
| 6.3.3 | THE ROLE OF THE OHS, THE SUPERVISOR AND THE EMPLOYER | 38 |
| 6.3.4 | EXAMINED FACTORS THAT WERE NOT FOUND PREDICTIVE OF RTW | 39 |
| 6.3.5 | TO ROUND OFF | 40 |
| 7 | CONCLUSION | 41 |
| 8 | FUTURE RESEARCH | 42 |
| 9 | ACKNOWLEDGEMENTS | 44 |
| 10 | REFERENCES | 48 |

LIST OF ABBREVIATIONS

| | |
|-------|---|
| CI | confidence interval |
| GP | general practitioner |
| HAKuL | <u>H</u> ållbar <u>A</u> rbetshälsa i <u>K</u> ommuner och <u>L</u> andsting (Work and health in the public sector in Sweden) |
| OR | odds ratio |
| OHS | occupational health service |
| RTW | return to work |
| WHO | World Health Organisation |

1 INTRODUCTION

Having a job is extremely important in our society. A ‘good job’ is not only a means of earning one’s living; it is also an arena for natural interactions with other people, leading to personal development and creating much of the identity of a person in our culture.

“Arbetslinjen” (based on the idea that everyone has the right and duty to work and support themselves) is a well-established principle that has been predominant in Swedish labour-market politics for many decades. The right of all citizens to work was for example emphasised by Ernst Wigforss, a Swedish Social Democratic politician who was Minister of Finance for some periods in the beginning of the 20th century.

During the last few decades the principle has been associated with sickness insurance and rehabilitation efforts. On 1st January 1992, a new reform with focus on working life was introduced in the National Insurance Act, in accordance with proposition 1990/91:141. Responsibility was placed on the employers and the regional social insurance offices to carry out the necessary measures for people to recover or maintain their work ability.

In accordance with “arbetslinjen”, the overall aim of working life rehabilitation is that as many citizens as possible should earn their living by gainful employment. Consequently, work is an advantage, as well as a right and a duty.

2 BACKGROUND

2.1 THE GLOBAL BURDEN OF MUSCULOSKELETAL AND PSYCHIATRIC DISORDERS

Wherever there are human beings there are musculoskeletal problems (1-6). Musculoskeletal disorders are the most common causes of severe long-term pain and physical disability, affecting hundreds of millions of people around the world. The costs are huge in terms of lost income and consumption of health and social resources, but musculoskeletal disorders are given low priority compared with the needs (7). After an initiative of researchers in Lund, Sweden, a decision was made in Geneva in January 2000 to launch a multi-disciplinary global campaign which was the start of the Bone and Joint Decade 2000-2010, endorsed by the United Nations and the WHO (7, 8). Low back pain is the most prevalent of musculoskeletal conditions and affects about 4-33% of the population at any given point (8). In a recent review of Roy et al on the global prevalence of low back pain, including 165 studies from 54 countries, the point prevalence was estimated to be 11.9% and the estimated one-month prevalence was 23.2%. Low back pain was found to be a major problem throughout the world, and was most common in women and people aged 40-80 years (9) The annual prevalence of neck pain among workers in a cohort of claimants to the Ontario Workplace Safety & Insurance Board in Canada was estimated to be 11.3% (10). Musculoskeletal conditions were found to be the most expensive disease category in Sweden, representing 22.6% of the total cost of illness (11).

When it comes to psychological conditions, it has been estimated that 14% of the global burden of disease has been attributed to neuropsychiatric disorders, mostly due to depression and other common mental disorders, as well as alcohol-use and substance-use disorders (12). In another study, 27% of the adult EU population, aged 18-65 years, were estimated to be, or to have been, affected by at least one mental disorder in the past twelve months, taking into account the considerable degree of comorbidity. About one third had more than one disorder, and the most frequent were anxiety disorders, depressive, somatoform and substance-dependence disorders (13). Long-term sick-listing due to musculoskeletal and psychological/stress-related disorders is a great problem in all developed parts of the world (14-21).

2.2 SICKNESS ABSENCE IN SWEDEN

From 1997 and up to an all time high in 2002, there was a considerable increase in the number of people on long-term sick leave in Sweden and especially among women. See Figure I.

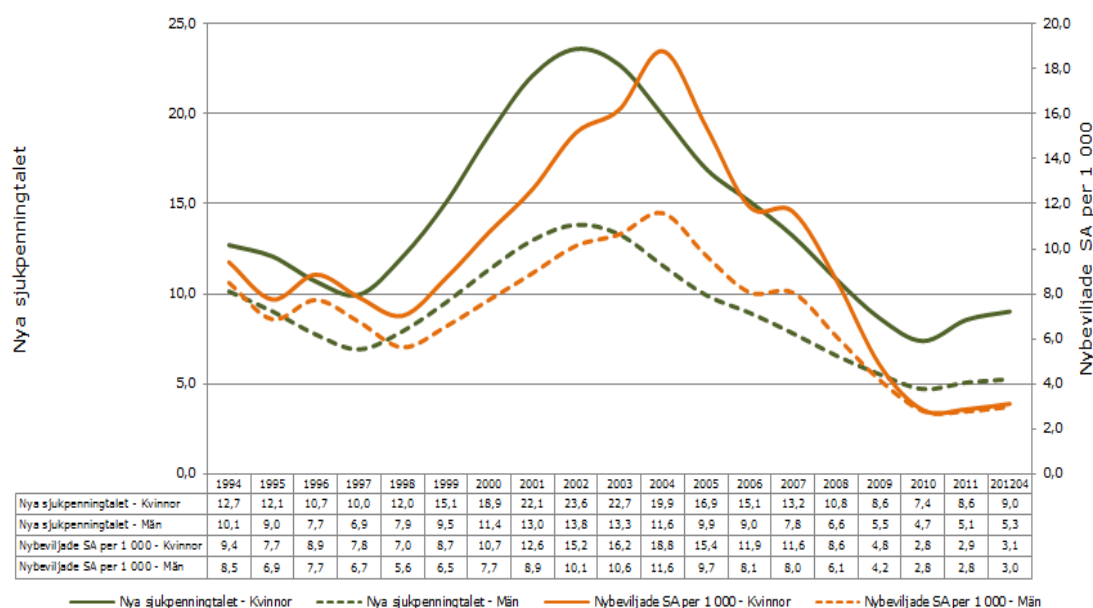


Figure I. The "new sjukpenningtalet" and newly granted disability pensions per 1000 inhabitants included in the insurance and between 16-64 years of age. Statistics from the Swedish National Social Insurance Board.

In a statistical comparison regarding people on sick leave for 60 days or more undertaken by the Swedish National Social Insurance Board, it was found that there was a great increase in the number of people on long-term sick leave between the end of the 1980s and 1999. Furthermore, this increase was only found among Swedish women, not among men (22). Comparisons between 1999 and 2001 showed that sick-listed women were more often younger, had psychiatric disorders and returned to work less often than previously. The greatest increase was in the public sector, and mostly among women employed within healthcare and education (23).

During the period of 2000-2004, the number of days when people either received sickness benefit or were on disability pension was equivalent to approximately 14% of all those in the 20-64 age group, and the total cost to the state was roughly 125 billion Swedish crowns in 2004 (24).

When the number of people on long-term sick leave had started to decline after 2003, the number receiving disability pension increased, and those who were granted disability pensions were younger and younger.

A new approach to statistics by the Swedish National Social Insurance Board, is the new "sjukpenningtalet" which is defined as the total number of paid days with sickness benefit, workers' compensation benefit and rehabilitation benefit per thousand persons included in the general insurance system and between 16-64 years of age. Partial paid days are calculated into whole days (25). In Figure II, the unbroken green line represents women and the dotted green line refers to men. The difference between women and men can be clearly seen.

“Nybeviljade SA” is defined as the number of people with newly granted disability pension for those between 16 and 64 years of age and corresponding allowances for young persons, aged 19-29 (25). The unbroken orange line represents women and the dotted orange line refers to men. An increase in disability pension can be seen when “sjukpenningtalet” declines. See figure I.

Marklund and co-authors discussed explanations for the high incidence of sickness absence, such as increasing change in working life, low labour market mobility, the ageing population, sick leave instead of unemployment and shortcomings in the administration of the sick leave insurance system. Contributing factors were also emphasised, such as the strain of personal life and the puzzle of life, increases in alcohol consumption and increasing overweight, the transition from long-term sick leave to early retirement, less constructive coping patterns that can result in employees being “locked” in sick leave instead of looking for new jobs, the increased burden of work for physicians and the difficulties they experience in withstanding increased demands for sick leave certificates, and the fact that the occupational health services lost their governmental grant in 1993 (24).

2.3 DISORDERS ASSOCIATED WITH LONG-TERM SICK LEAVE IN SWEDEN

Musculoskeletal and psychiatric disorders are the dominating problems among people on long-term sick leave, also in Sweden (26). In the beginning of the 2000s psychiatric disorders increased and musculoskeletal decreased to an equal level with 30% each in 2006; since then psychiatric disorders have overtaken musculoskeletal disorders. Between 1999 and 2003 the share of people with long-term sickness absence due to psychiatric disorders increased from 18 to 30%. Depression, stress-related and anxiety disorders are the most common psychiatric disorders (26). See Figure II.

The share of musculoskeletal and psychiatric disorders among persons on sick-leave ≥ 60 days

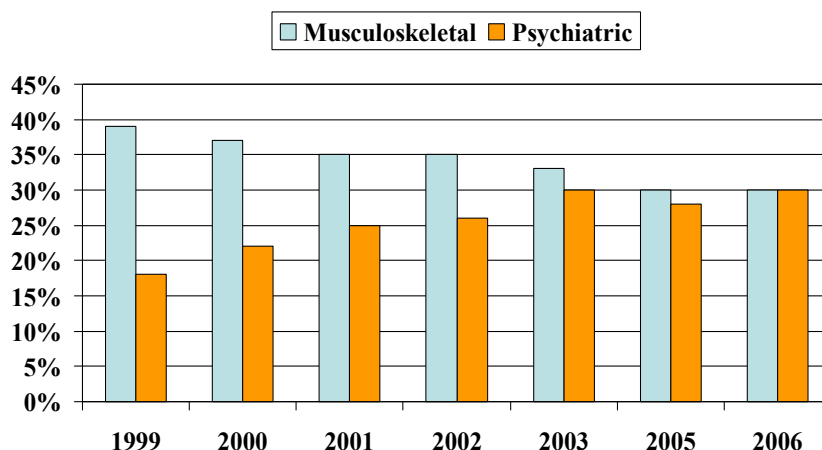


Figure II: The share of musculoskeletal and psychiatric disorders among people on sick leave ≥ 60 days

Depression and anxiety are more common in women, whereas alcohol problems are more common among men (16). Periods of sickness absence due to psychiatric problems tend to be long, and disability pensions are relatively common in younger people, which means that the costs to society for psychiatric disorders are high (16).

Hensing et al also pointed out that the increase does not necessarily mean that psychiatric disorders per se have increased in the working population. As a result of the change in attitude to psychiatric disorders they have become more acceptable. For this reason patients are more willing to talk about psychiatric problems, and physicians are more inclined to write sick leave certificates. There is also access to more and effective treatments for psychiatric disorders. The increase in stress-related disorders and psychosocial problems in the work environment, particularly in the public sector, may also contribute (16).

Sleep disturbances have become more common in the working population. Westerlund et al compared three cross-sectional samples of the Swedish working population aged 16-64 in 1993, 1995 and 1999. Questionnaire data were linked to records of medically certified spells of sick leave exceeding 14 days, taken from national registers. A total of 28,424 individuals completed data (17). The authors found that the proportion of work-related sleep disturbances at least once a week increased from 12.3% in 1993 to 21.7% in 1999. The corresponding figures for men were 12.5% to 18.6%. There was a strong cross-sectional association between work-related sleep disturbances and sickness absence (17).

Among the musculoskeletal disorders, back and neck pain are the most usual causes of both short- and long-term sick leave (27). In a study of Nyman et al in 2002, Sweden and the Netherlands have the highest rates of sick leave for back and neck disorders among the EU countries (28). In a Swedish study on cost of illness, conducted in 2001, Wolf et al found that musculoskeletal conditions were the most expensive disease category, representing 22.6% of the total cost of illness (11). However, since 1999 the proportion of people in Sweden on long-term sick leave of 60 days or longer due to musculoskeletal problems, has slowly but continuously decreased from 38% in 1999 to 26% in 2009, most of all among women. Among men, low back pain is still the most common cause of long-term sick leave (26).

2.4 CONSEQUENCES OF SICK LEAVE

There have been attempts to find out how sick leave per se has an influence on health and the course of long spells of sick leave. Vingård et al found research in this area scarce (29). The authors only found one study that addressed the consequences of long-term sick leave on an individual level, such as inactivity, social isolation, depressed mood, and lower self-confidence (30). Floderus et al found negative consequences particularly related to leisure activities, sleep and psychological well-being (31). Sieurin et al found that people on sick leave received lower wages and fewer promotions (32).

2.5 THE IMPACT OF DEPRESSION

Depression can be seen as a consequence of sick leave, but there is also a known association between pain and emotions such as depression (33-39). In a cohort of work-related musculoskeletal disorders it was found that participants reporting high depressive symptoms one month post injury, experienced that their symptoms persisted six months post injury, and many of them had not returned to work (40). Depression

and anxiety were found to have a great impact on the post-operative outcome of herniated disc surgery, RTW, and experience of pain (41). However, in a study of people with non-chronic pain, lasting less than three months and classified as non-specific low back pain, depression was not found predictive of RTW (42).

2.6 NUMEROUS DETERMINANTS OF RTW OUTCOME

In the literature numerous determinants of RTW are found, but context, study groups and factors of interest etc often differ. In a review of Krause et al (43) in order to support and suggest research priorities in connection with RTW, they provided lists of core risk factors for prolonged and delayed RTW. Such core risk factors were socio-demographic factors such as age, gender and previous injury, psychological factors such as depression, attitudes and beliefs, health behaviour, clinical measures, specific medical diagnosis, the severity of injury and illness, injured body parts, compensability, longer time off work, pain intensity and radiation, medical and vocational rehabilitation interventions in acute, sub-acute and chronic disability phases, physical and psychosocial job characteristics, social support, the organisational level of the employer, employer- or insurer-based disability prevention and disability management interventions, the complexity of the compensation system, dismissal during sick leave etc (43).

2.6.1 The return to work process

The process from long-term sickness absence to RTW is often complex, multifaceted, and explained not only by strict medical reasons. The return to work process can be viewed in different ways, and research in the field can be conducted from different perspectives, for example the characteristics of the person on sick leave, the medical care system, vocational rehabilitation, physical and psychosocial job characteristics, interventions in the workplace, the employer, the disability insurance system, the labour market and so on. Loisel et al have illustrated the arena in work disability prevention (44). This model can also serve as an illustration of domains involved in the return to work process. The framing domains are: personal system, healthcare system, workplace system, and legislative and insurance. See Figure III.

Overall societal context

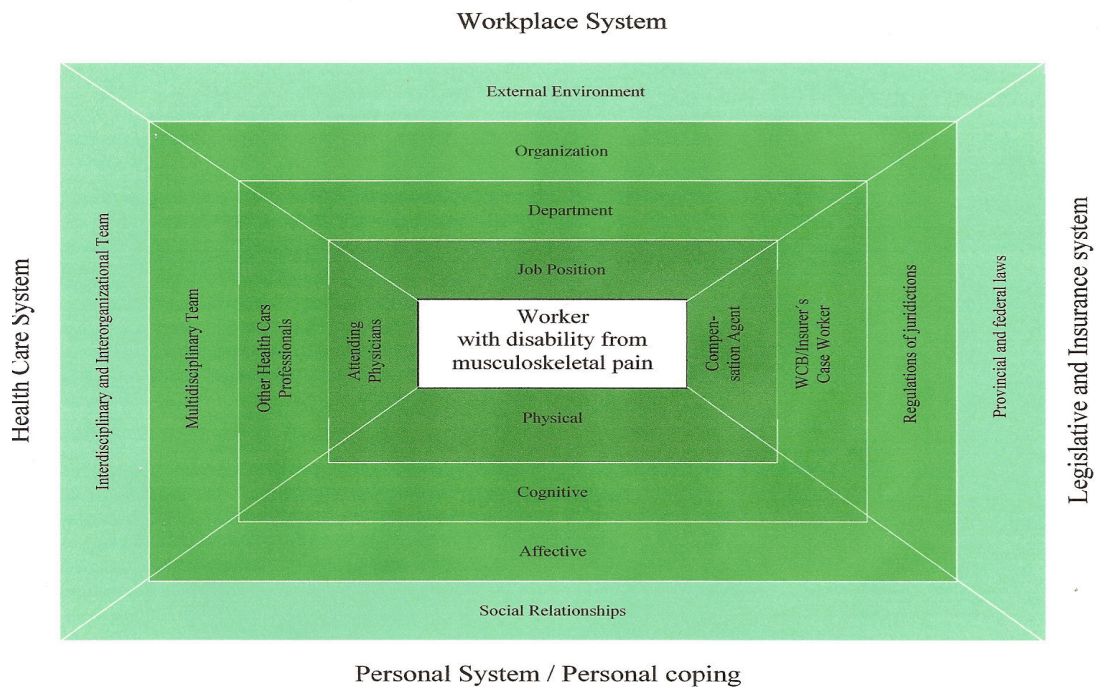


Figure III: Model after Loisel et al 2005, serving as an illustration of domains involved in the RTW process.

2.6.2 Personal system – return to work as behaviour

The complexity of RTW has resulted in efforts to find more apprehensible and fruitful perspectives on RTW, including the possibility of finding standardised methods for measuring the extent or grading the RTW process. Such a perspective is that return to work after injury or illness can be regarded as a behaviour influenced by physical, psychological and social factors (45). In order to find a conceptual framework for combining physical, psychological and social factors in the return to work process, the authors have tried to combine factors from two different models – the **Phase Model of Occupational Disability** (46), based on the duration of work disability and the development of the disabling process, and the **Readiness for Change Model** – into a new combined model called the **Readiness for Return-to-Work Model** (45). The Phase Model of Occupational Disability is based on findings that factors and interventions differ, depending on the length of time that has elapsed since the injury. Physical risk factors tend to be particularly important during the early phases, whereas psychosocial factors, such as mental disorders or presence of litigation, act predominately in later phases (46).

The Readiness for Change Model (47) is based on research of Prochaska et al, whose focus was health promotion and stages of change in relation to smoking and other addictive behaviours. They propose that individuals are at one of five motivational stages: pre-contemplation, contemplation, preparation for action, action, and maintenance (47). Frache and Krause have applied the Readiness for Change Model to the behaviour of returning to work. In the pre-contemplation stage, there is no attention

to initiating behaviours that support adaptive adjustment to RTW. In the contemplation stage, the employee begins to consider returning to work in the foreseeable future, but is ambivalent. In the preparation for action stage, the employee makes plans for RTW in the near future. Action means that the employee puts the plan into action and goes back to work in some capacity, but there is a high risk of relapse. In the maintenance stage, the employee uses specific skills to face situations that can trigger a relapse. The Readiness for Change Model also proposes certain time frames, which need to be considered when determining which stage the individual is at, but the severity of their injury also has to be taken into account.

Furthermore, three dimensions are involved in mediating progression from pre-contemplation to maintenance regarding behavioural change: decision balance, self-efficacy, and change processes (45). Decision balance reflects the cognitive process of weighing the pros and cons of returning to work. Self-efficacy refers to the individual's confidence in engaging in return to work. Processes of change involve both change in thoughts, feelings and attitudes as well as communication with others about the intention or desire to change. Decision balance, self-efficacy and change are not only processes within the person on sick leave; they are also processes within representatives of the employer/workplace, and the healthcare and insurance systems.

Over the years there have been many attempts to characterise human behaviour. Some of the theories that are still in current use are mentioned here.

2.6.2.1 Coping – cognitive and behavioural efforts to manage psychological stress

Richard Lazarus and his co-worker Susan Folkman are connected with the concept of stress and coping used in studies and theories that started in the United States in the 1960s. In an article from 1993, Lazarus summarises their theory and research on coping (48, 49). Coping is emphasised as a key concept in adaptation and health. There are two approaches to coping, which are in contrast with one another: coping as a style, i.e. as a personality trait, and coping as a process (49). From a process perspective, coping changes over time and in accordance with the situational context in which it occurs. From this standpoint, coping is defined as ongoing cognitive and behavioural efforts to manage specific external and/or internal demands that are regarded as taxing or exceeding the resources of the person. The definition can be simplified by saying that coping consists of cognitive and behavioural efforts to manage psychological stress. The term coping is used whether the process is adaptive or non-adaptive. Within the theory of coping as a process, there are two major functions of coping: problem-focused and emotion-focused. The function of problem-focused coping is to change the troubled person–environment relationship by acting on the environment or oneself. The function of emotion-focused coping is to change either the way the stressful relationship with the environment is attended to or the relational meaning of what is happening, which mitigates the stress even though the actual conditions of the relationship have not changed. Changing the relational meaning of what is happening is a very powerful and widely employed device for regulating stress and emotion (49).

2.6.2.2 Locus of control – difference in perception leads to difference in behaviour

Rotter and co-workers have investigated the concept of locus of control and distinguish between external and internal locus of control (50). A person with an external locus of control has the perception of a situation as controlled by chance, luck, fate or powerful others. This perception leads to predictable differences in behaviour in comparison with situations where a person feels that reinforcement is controlled by his own behaviour,

i.e. has an internal locus of control (50). Further results of their investigations show that individuals who tend to perceive reinforcement as contingent upon their own behaviour are more likely to take social action to better their life conditions, are more likely to learn and remember information that will affect their future goals and are generally more concerned with their ability. Individuals who seem to be more internal also appear to have a greater need for independence (50).

The concept of locus of control has also been found to predict different social behaviours, learning performances and more achievement-related activities (51). It has also been found that external locus of control is associated with powerlessness and helplessness. Seeman and Lewis showed associations between helplessness and health problems observed five and ten years later (52). Seeman and Seeman found that powerlessness is the most consistent predictor of alcohol use and abuse (52).

2.6.2.3 Salutogenesis and sense of coherence (SOC)

In 1979 Anton Antonovsky published a theoretical model designed to understand the relations between stressors, coping and health (53), which he further developed in 1987 (54). He regarded health as a movement in a continuum on an axis between total ill health (dis-ease) and total health (ease). In his early research he contacted women who had survived stays in concentrations camps and had managed to return to ordinary life, seeming to feel quite well. He found this a miracle and a mystery, which gave rise to his salutogenic concept instead of the current pathogenic in biomedical and science research (55). Salutogenesis means the origin of health, and Antonovsky regarded salutogenesis as a concept which focuses on resources and maintains and improves the movement towards health (56). The ability to comprehend the whole situation and the capacity to use the resources available was called sense of coherence (SOC) (56). Sense of coherence has three components: comprehensibility, meaningfulness and manageability. The capacity to use available resources was a combination of peoples' ability to assess and understand the situation they were in (comprehensibility), to find it meaningful to move in a health-promoting direction (meaningfulness) and also to have the capacity to do so (manageability) (56).

Antonovsky considered SOC to be in contrast to concepts such as self-efficacy, internal locus of control, and problem-orientated coping; these concepts are more associated with particular stressors in particular cultures, whereas SOC cuts across lines of gender, social class, religion and culture. (55).

Antonovsky also constructed the SOC scale, which has been widely used all over the world. In a systematic review, Eriksson and Lindström found that the SOC scale can predict a positive outcome also in a long-term perspective. The SOC scale seems to be a reliable, valid and cross-culturally applicable instrument for measuring how people manage stressful situations and stay well (57). SOC is strongly related to perceived health, especially mental health (58).

2.6.2.4 Motivation and return to work

Berglind and Gerner have presented an interesting study on RTW for people on long-term sick leave (59), based on an action theory approach developed by Berglind (60, 61). This perspective focuses on human actions as choices between different alternatives. Here the alternatives are to work or not to work. According to the theoretical perspective, three basic factors determine how a person on sick leave chooses: what the individual wants (preference), what he thinks he is capable of doing (perceived competence) and what he thinks he can get (opportunities). These three perceptions are more or less correlated, varying from one person to another. What a

person can do is related to both competence and opportunities. In this study, a questionnaire based on the action analysis model was composed, with questions about what kind of work they wanted, whether they thought they could get such job, and whether they thought they could manage this type of job. After two years a follow-up was performed regarding RTW. The results showed that the questions had good predictive validity, i.e. there was a clear correlation between the answers and employment status two years later. Wanting to return to work was connected to the individual's view of his/her possibilities. The authors concluded that what a person wants is not an isolated opinion; it is clearly connected with the other aspects, particularly own competence (what they can manage) (59).

The three basic components in the action analysis model – what the person wants, what the person thinks he is capable of and what he thinks he can get – have an association with self-confidence.

2.6.2.5 Self-efficacy and own expectations

Bandura's concept of self-efficacy, people's beliefs in their efficacy to manage their own functioning and to exercise control over events that affect their lives, is regarded as the most central foundation in human activities (62, 63). Whatever other factors serve as guides and motivators, they are rooted in the core belief that one has the power to produce desired effects by one's own actions. Self-efficacy beliefs regulate human functioning through cognitive, motivational, affective, and decisional processes (63). There is now much research that verifies the predictive generality of efficacy beliefs as significant contributions to the quality of human functioning (63).

In studies on return to work, Franche and Krause found that self-efficacy and expectations regarding recovery have a significant impact on rates of return to work (45). Fishbain et al also found a relationship between job perceptions and actual return to work after pain facility treatment among chronic pain patients (64). Similarly Heymans et al found that expectations and beliefs affected the RTW process among workers with low back pain (65). In a qualitative research study it was also found that both workers and stakeholders were of the opinion that it was important to consider workers' perceptions of recovery and work (66).

To sum up, the models mentioned here: coping, locus of control, salutogenesis, action analysis as well as self-efficacy and own expectations, have common elements, but they represent different approaches to try to understand the complexity of human behaviours.

All these theories are thought-provoking and show in different ways that human behaviours start with mental processes. Support, encouragement and guidance in taking these valuable mental resources into account, must have the highest priority when it comes to rehabilitation and RTW efforts.

2.6.3 The healthcare system

2.6.3.1 Organisation

When health is impaired and pain is present, people come into contact with the healthcare system, most often in primary care settings or in the occupational health services. In Sweden most primary care units are public and run by county councils, but it has become increasingly common that primary care units are under private management.

The occupational health services lost their governmental grant in 1993 (24) and are now obliged to support themselves and provide their own resources. The use of occupational health services is regulated in the Occupational Safety and Health Act, third chapter. The requirements of the law are specified in §12 in the regulations and guidelines of the Work Environment Authority about systematic environmental work (67). The basis for these regulations is contained in the Work Environment Act, which provides the framework for the environment at work. {regeringen, 2012 #208}. It is unique that private business is regulated by laws in this way (67).

According to statistics from the Work Environment Authority and Statistics Sweden, about 65% of all employees have access to an OHS through their employment (67). People working in the public sector are most often connected to an OHS. However, the connection rate to an OHS differs between large and small companies, and between different kinds of trades and professions. Furthermore there is considerable variation in what kinds of services the companies are willing to pay for.

Occupational health services have several tasks: serving as a resource in preventive environmental work in the workplaces; providing a resource when employees need work modification or rehabilitation, regardless of whether it is an occupational injury or impairment due to other injuries or illnesses; promoting health; and contributing to a sustained work ability among the workers (67).

It is possible to refer employees if necessary from primary care units, either public or private, and from the OHS to specialists, most often in hospitals but also in private clinics.

2.6.3.2 Medical intervention

When it comes to medical treatment of chronic pain conditions, evidence has been found in favour of multimodal team rehabilitation with a cognitive behavioural approach (68-70). Multimodal rehabilitation denotes a combination of psychological measures and physical activity/exercise, using manual or physical methods. Healthcare personnel work in a team, of which the patient is also a member. The measures need to be coordinated and continued over a lengthy period of time (71). A systematic review from 2006 showed strong evidence for the advantage of multimodal pain rehabilitation treatment. Multimodal team rehabilitation treatment has served as an intervention to reduce pain, shorten time on sick leave and as an enhancement of RTW (72). However, in a later systematic review the pain-reducing effect after multimodal rehabilitation could no longer be found regarding people with neck, shoulder and lower back pain, but multimodal pain programmes are still found to improve the potential for RTW, to reduce sick leave and also to increase patients' own perception of work ability (71). Furthermore, patients with long previous sick leave can increase their working time after a multidisciplinary rehabilitation programme (73). This study was performed on people who had been on sick leave for at least 90 days. Norrefalk et al still found an effect on RTW after multimodal rehabilitation in a six-year follow-up. In this study the interventional group also had a higher level of activity and a lower level of pain compared with the control group (74). Busch et al found positive effects on sickness absence and cost-savings even ten years after multimodal rehabilitation compared to those treated as usual (75).

To conclude, there are disparities in the literature about the benefit of multimodal rehabilitation on pain but clear evidence for its benefit on RTW.

Hoffman et al found in a meta-analysis that cognitive behavioural and self-regulatory treatments on chronic low back pain were especially beneficial regarding pain intensity, health-related quality of life and depression. Multidisciplinary approaches including a psychological component had positive long-term effects on RTW but only short-term effects on pain (76).

Netterstöm et al tested and found a significant effect of multidisciplinary stress treatment programmes on the RTW rate in people with work-related stress. The programme included identification of relevant stressors, changing coping strategies, relaxation techniques, physical exercise and test of depression scores. (77).

Treatment with cognitive behavioural therapy (CBT) has shown promising results, and studies have been performed in cohorts with problems of different kinds (78-83). Behavioural medicine is based on the concept that the patient's thoughts, behaviour and environment are of importance for rehabilitation (71).

The long-term results of CBT on people with anxiety disorders and psychosis have been tested in Scotland. The researchers contacted participants in eight earlier randomised studies and found that the relative gains of CBT were greater in anxiety disorders than in psychoses. Poor outcome after CBT was related to greater complexity and severity of presenting problems at the referral (79).

Lagerveld et al investigated a group of employees on sick leave due to common mental problems such as depression, anxiety and adjustment disorders, and found that work-focused CBT, where integrated work aspects were introduced early in the treatment, was more effective regarding RTW in comparison with usual CBT (80).

Hoefsmit et al studied RTW interventions from a broader perspective (84). The aim was to detect and identify characteristics of RTW interventions that generally facilitate RTW, i.e. in multiple target populations and across interventions. They found support for multimodal interventions, not only for people with back pain but also for people with adjustment disorders. Early interventions, within six weeks were scarcely found in the literature but gradual RTW was found effective for those with physical complaints.

2.6.3.3 Vocational interventions

The National Insurance Act in Sweden distinguishes between medical and vocational interventions, but in reality it is difficult to separate the two, since medical and vocational interventions, measures and treatments often take place in parallel. It is also difficult to find out exactly what was successful, when several measures have been taken. People with long-term pain and long-term sickness absence also have several needs, which is a reason why multimodal rehabilitation is preferable, where different sorts of individual measures can be interspersed with a scheduled programme and measures at the workplace such as work modification.

RTW programmes with a combination of clinical/medical and occupational interventions have shown promising results in reducing work absenteeism. Programmes with employer participation, a supportive work climate and cooperation between labour and management provided the best evidence for faster RTW, including reduction of pain and disability (85-90).

However, it has also been found that interventions which involve the work environment and concerted action by the various partners and stakeholders seem to require the greatest investments in terms of energy (91).

2.6.4 The workplace

In a country such as Sweden, where most people, both women and men, are engaged in gainful work outside the home, the workplace is an important part of life.

The Job Demand–Control model of Karasek and Theorell has been much in focus. They found that a hectic and psychologically demanding job and low decision latitude increased the risk of developing cardiovascular and cerebrovascular symptoms and premature death (92). Job strain, high level of psychological demands combined with a low level of decision latitude, has been hypothesised to induce mobilisation of energy and inhibition of anabolism (93).

De Jonge et al found in a large cross-sectional study on 11,636 Dutch men and women that employees reporting high job demands and low job control had an elevated risk of emotional exhaustion, psychosomatic and physical health complaints and job dissatisfaction (94). However, the adverse influence of increasing demands on job satisfaction, psychosomatic complaints and emotional exhaustion can be reduced with increasing job control (95). Lidwall and Marklund confirmed the demand–control model and its association with long-term sickness absence. The job strain hypothesis was found to be more evident in the private sector. Active jobs with high psychological demands and high decision latitude seemed to be more problematic for many women, especially in the private sector (96).

2.6.5 Legislation within the National Insurance Act

All persons living and working in Sweden are connected to the general social insurance system, regardless of whether or not they are employed. In 1991/92, legislation for a new rehabilitation reform was passed in Sweden. The goal was reduced rates of sickness absence, which was to be realised by improving working conditions, providing more effective rehabilitation, and promoting sustained gainful employment. The new rehabilitation legislation within the National Insurance Act stated that after 28 days of sick leave, the employer, in consultation with the employee, is responsible for carrying out a rehabilitation investigation addressed to the regional social insurance office. This was a way of emphasising that the employer, in consultation with the employee, is responsible by law for assessing the requirements of rehabilitation at the workplace, and for initiating measures to promote effective rehabilitation. However, from 1997 onwards, after some years when rates of long-term sick leave declined, there was a considerable increase in the rates of long-term sickness absence, and in 2002 they reached an ‘all time high’ level. See Figure I.

The government had to take counteractions and new legislation was launched, which came into force on 1st July 2008 (97). The ‘rehabilitation chain’ was introduced, which means that the right to financial sickness benefit is tested differently in the social insurance system according to a time schedule. For the first 180 days a person’s work ability is tested in relation to his/her ordinary work. After 180 days of sickness benefit the person’s work ability is tested in relation to the whole labour market, which means that many people drop out of the general social insurance system. Most of them continue within the employment office.

The duration of sick leave that had previously no legislated time limit in Sweden, was now set at a maximum of $365+550 = 915$ days, i.e. 2.5 years. If people are still unable to resume work after 2.5 years, they must go to the employment office for at least three months to get further allowances. At the employment office they receive individual help and support in their vocational rehabilitation. Those found to have no work ability must visit their physician again after three months to receive a new certificate of illness. The regional social insurance office can then establish their right to new sickness allowances and they can enter the system again from day 1. People found to have no work ability can apply for whole or partial sickness pension, but this is very difficult to receive despite a formal report from the employment office. More people than before, especially young people under 30 years of age, are now outside the ordinary social insurance system and are referred to social allowances from the municipalities where the level of benefit is lower (98).

The government has also introduced the so-called 'rehabilitation guarantee' for medical rehabilitation. It is now easier and quicker for people to get access to multimodal rehabilitation and cognitive behavioural therapy.

In the new legislation the former responsibility of the employer to conduct a rehabilitation investigation after 28 days of sickness absence is no longer applicable, but the employer is still responsible for assessing the requirements of vocational rehabilitation, to promote and adjust work to the extent that is possible and to provide assistive work devices.

However, the research in this thesis was conducted while the old legislation from 1991/92 was in force.

2.6.6 Cooperation and interaction between stakeholders

The interaction between organisations and stakeholders is important. In the Manitoba Work Ready Study many potential stakeholders were interviewed about barriers to RTW (99). The stakeholders included in the study were workplace owners, managers, employees, physicians, other health professionals, occupational rehabilitation specialists, workers, union members, advocacy and educational groups, government departments such as workplace health and safety, and regulation bodies for health professionals. Perceived barriers to RTW included delays in all types of processing or delivery of information or treatment, and ineffective communication among stakeholders. Facilitators for RTW included establishment of RTW programmes in the workplace, effective communication and team work, as well as trust and credibility among stakeholders. In the Manitoba Work Ready Study many potential stakeholders were interviewed about barriers to RTW. The interdependence of organisational structures and human interactions was evident. (99).

3 AIMS

The overall aim of this thesis was to investigate people on long-term sick leave in order to find promoting and hindering factors in the return to work process.

Specific aims for each study were:

I. To describe medical reasons for sick leave, duration of the problems and of the ongoing spell of sickness absence, the rehabilitation support and the person's own expectations of their future return to work.

II. To investigate if the predictions of people on long-term sick leave on their future RTW had an impact on their return to work.

III. To describe the frequency of full, partial and no RTW after long-term sick leave, and to investigate the influence of psychosocial work conditions, work ability and health, reported before the onset of sick leave, on full and partial RTW respectively.

IV. To describe the experiences of driving and implementing a workplace-based rehabilitation intervention with good access to rehabilitation measures, to find out who were advocated to receive multimodal and/or vocational rehabilitation, and to find predictors of return to work.

4 MATERIAL AND METHODS

4.1 STUDY DESIGN

Study I: A descriptive cross-sectional study.

Study II: An 18-month follow-up of Study I.

Study III: A prospective study with a two-year follow-up.

Study IV: An interventional prospective three-year study, including a two-year follow-up.

Table I. Overview of the design and methods of the studies

| | Study I | Study II | Study III | Study IV |
|---------------------|--|--|--|--|
| Design | Descriptive cross-sectional | An 18-month follow-up of Study I | A prospective three-year study with a two-year follow-up | A prospective interventional three-year study with a two-year follow-up |
| Study population | 21,000 employees | 21,000 employees | 9,000 employees | 9,000 employees |
| Data collection | Postal question-naire | Follow-up by reports from the human resource departments | Reports from the human resource management and a preceding questionnaire | Reports from the human resource management with additional information from the OHS and from a form |
| Study group | n=535 people 484 women, 51 men | n=508 people 462 women, 49 men | n=853 people 777 women, 76 men | n=779 people 704 women, 75 men |
| Response rate | 69% | 95% of the responders in Study I | 71% | 77% |
| Age | Median-age: Women 50 years (24-64) Men: 51 years (31-64) | 18 months older than in Study I | Mean age: 48 years at the onset of sick leave | Mean age: 47 years (20-63) |
| Methods of analyses | Chi-square test | Logistic regression | Logistic regression | Narrative Logistic regression |
| Main exposure | Full-time sick leave for 90 days or more | Full-time sick leave for 90 days or more | Full-time sick leave for 28 days or more | Full-time sick leave for 90 days or more and intervention |
| Outcome measure | Descriptive data such as medical reasons for sick leave, duration of the problems and actual sick leave, rehabilitation support, and the people's own expectations of their future RTW | Return to work | Return to work and environmental factors at work before the sick leave | Experiences of driving and implementing an interventional project. Characteristics of people receiving multimodal and/or vocational rehabilitation and return to work |

4.2 THE HAKUL STUDY

The participants in all four studies in this thesis were connected with the longitudinal HAKuL study (Work and Health in the Public sector in Sweden), which started in 1999 and was completed in 2004, with the overriding aim to promote health and sustained

work ability as well as implementation and support of early rehabilitation for people with impaired work ability. The study was conducted in four county councils and in local authorities in six municipalities representing the southern, the middle, and the northern parts of Sweden, and comprising about 9,000 people in all. The participating county councils and local authorities were strategically chosen in collaboration with the national and local employer organisations and unions, in order to cover different parts of the country as well as different fields of activities in the public sector, such as preventive work, work environment and rehabilitation. This procedure was necessary in recruiting organisations with a long-standing commitment to the study, as the included organisations had to help with administration of questionnaires, take part in rehabilitation measures, report employees on long-term sick leave to the research group etc. The majority, 81%, of those asked to participate were women, which is the usual gender distribution among employees in county councils and municipalities. The main occupational groups were registered nurses, assistant nurses, home-based personal care workers in elderly care, employees at childcare centres, administrative personnel, and teachers.

The study population in Studies III and IV were the same as in the longitudinal HAKuL study: about 9,000 people in all.

The study population in Studies I and II consisted of a whole municipality in the middle of Sweden in addition to employees in the above-mentioned longitudinal HAKuL study. The source population was in total 21,000 persons.

About 25% of all people gainfully employed in Sweden work in local authorities in municipalities and county councils, and the majority are women.

All four studies in this thesis were addressed to people on long-term sick leave and had a focus on return to work. The studies were performed between 1999/2000 and 30th of June 2005.

4.3 SUBJECTS

4.3.1 Study I

From the 21,000 people in the source population, all those with an ongoing spell of full-time sickness absence for 90 days or longer, were identified by the human resource department on one special day for each municipality and county council over a period of one year during 1999 and 2000. Individuals with advanced malignant tumours, pregnancy complications and serious mental illnesses such as psychoses were excluded. The remaining group of 776 people were asked to participate. Postal questionnaires with three reminders were sent out from Karolinska Institutet, and if necessary a telephone call was also made. Non-responders were sent a short form of the questionnaire and an alternative offer of an interview by telephone. The original questionnaire was answered by 476 people, the short form by 54 people and five people were interviewed by telephone.

In total answers were received from 535 people, 484 women and 51 men, giving a response rate of 69%. The median age of the women was 50 years (24–64) and of the men 51 years (31–64). The largest occupational groups among the women were home-based carers (n=129), assistant nurses (n=59), childcare workers (n=46), mental attendants (n=28), registered nurses (n=25), and cleaners (n=25). The occupational

groups among the men were varied, but the largest groups were teachers (n=8) and mental attendants (n=4). Analyses of responders in comparison with non-responders, 216 persons, did not reveal any significant difference in sex, age, or occupation tested by chi-square test.

4.3.2 Study II

A follow-up of Study I was performed 18 months later regarding RTW. The same human resources departments as in baseline were asked to report the study persons' actual occupation, workplace and sickness absence over the 18 months. We classified RTW as their work status on the 18th month after the baseline investigation. People on sick leave for a part of the 18th month were counted as returners if they had been working for more than 15 days in the 18th month, and otherwise as non-returners. Those who had returned to work part-time were counted as returners. For those who had left their jobs or where data obtained from the human resources departments were not sufficient, an additional form was sent out by post. Non-responders and those for whom data were still incomplete were contacted by telephone. It was found that of the 535 people who had answered 18 months earlier, seven had retired due to age and three had died; these people were excluded from the following analyses. RTW data were missing for 17 people, those who had quit their jobs and had not answered the final questionnaire or were impossible to reach by telephone. The analyses were made on the remaining 508. See Figure IV.

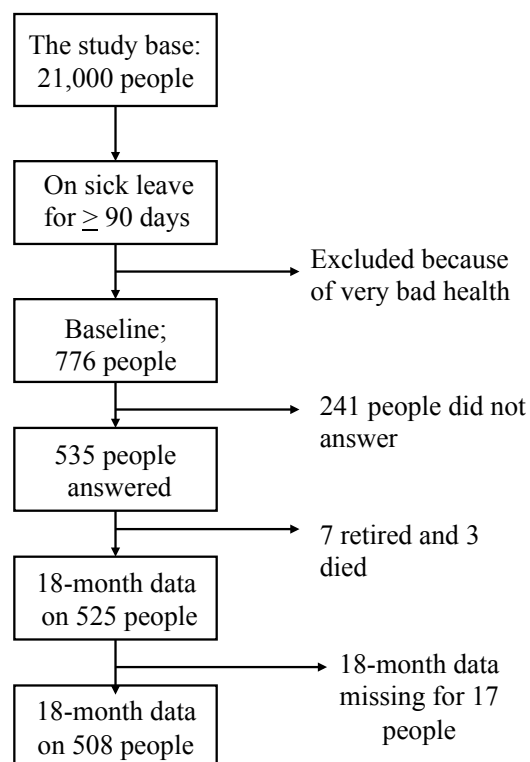


Figure IV: Flow chart of included cases, excluded cases and dropouts

4.3.3 Studies III and IV

New spells of sick leave among the source population of 9,000 persons in the longitudinal HAKuL study were reported by the supervisors during a period of three years. The development of the sick leave spells was followed by regular contact

between the HAKuL project organisation and the human resource management. The occupational health services provided additional information about rehabilitation measures. All were employed when the study started. The study groups in both Studies III and IV were sub-samples of employees in the longitudinal HAKuL study.

In Study III, associations were made between sick leave and answers to the questionnaire distributed prior to the start of the longitudinal HAKuL study when they were not on sick leave. The participants in Study III had at least one spell of continuous full-time sick-listing for 28 days or more during the three years, after the questionnaire, and at the time of the onset of sick-listing were younger than 63 years of age (1202 subjects). The dropout rate, due to not answering the questionnaire (234 subjects), ending their employment contract (72 subjects) and lack of information concerning RTW (42 subjects), was 29%. The actual study group consisted of 853 employees who had at least one spell of sick leave for 28 days or more during a three-year period. Of the 853 who were sick-listed, 89% were females, the mean age was 48 years and 53% were 50 years or older at the onset of sick leave.

Study IV included a rehabilitation interventional part designed for people on long-term sick leave with musculoskeletal problems with or without concurrent psychological/stress-related problems, and for those with cardiovascular and respiratory problems.

The three-year study period revealed 947 people reported with full-time sick leave of 90 days or more. For 37 of the sick-listed people no cause of sick leave was given, and 90 had problems and complaints that were not in line with the inclusion criteria. At the two-year follow-up, 14 people had passed away, 9 had reached retirement age and 18 had left their jobs and were impossible to follow up. A further 44 people had quit their jobs, but the actual status when they left was known and they remained in the study group despite a follow-up of less than two years.

The final study group comprised 779 people: 704 (90%) women and 75 (10%) men. The overall average age was 47 years (20-63).

4.4 METHODS

4.4.1 Studies I and II

Study I was a descriptive study of long-term sick-listed people based on a questionnaire with questions collected from two previous Swedish studies (100, 101). The questions covered demographic data, occupation, medical diagnoses, duration of the disorders, measures to facilitate return to work, the feeling of being welcome back to work, and their own prognosis of return to work.

Measures to facilitate return to work included personal contact between the employer and the employee, the rehabilitation investigation of the employer (which was required by law at that time), personal contact by the regional social insurance officer, contact with the occupational health service or the trade union, and rehabilitation measures. 'Compound rehabilitation' included rehabilitation programmes at least four hours a day and four days a week for at least two weeks. Vocational rehabilitation included change of task at the workplace and/or general education and/or vocationally oriented education and/or assistive work devices. 'Other kind of compound rehabilitation'

addressed a combination of physiotherapy, psychotherapy, and at least one vocational measure mentioned above.

The short-form questionnaire and interview included questions about demographic data, occupation, medical diagnoses, duration of sick leave, rehabilitation support, treatment and rehabilitation measures, and the person's own opinion of their chances of returning to work.

Study II was an 18-month follow-up of Study I regarding RTW. In the baseline study, self-reported symptoms and disorders were divided into five groups: musculoskeletal problems, mental problems, respiratory disorders, cardiovascular disorders and others. Thirty-five per cent, 185 out of 525, had combinations of symptoms and disorders from the different groups. In this study we chose to test those with one self-reported complaint contra those with two or more complaints. The questions about pain and function were based on von Korff's questionnaire (102), which contains three questions about pain and function respectively. The mean of the three questions multiplied by ten, gave a measure from zero to 100. These numbers were then divided into quartiles. In the standard instructions of von Korff, pain and function were combined, but as we had different kinds of symptoms and disorders we separated pain from function.

Occupation was divided into physically strenuous work and not physically strenuous work. The following occupations were regarded as physically strenuous: home-based carers, assistant nurses, childcare workers, mental attendants, cleaners and kitchen staff. Registered nurses, teachers, office workers and those with an academic education were regarded as not having physically strenuous occupations. As registered nurses in Sweden have a great deal of administrative work besides straight nursing duties, we regarded their work as not physically strenuous. The remaining variables from Study I were dichotomised, such as contact with workmates, perception of being welcome back to work and contact with different rehabilitation providers and stakeholders at the workplace.

The question about the participant's own prediction of RTW was phrased: "What is your opinion about your work ability in the long term?" with five response alternatives. Four alternatives were positive predictions, but with differences in profession and working hours as follows: 1. I will be working in my profession with the same working hours as before. 2. I will be working in my profession but with reduced working hours. 3. I will be working in another profession but with the same working hours as before. 4. I will be working in another profession but with reduced working hours. The fifth alternative was a negative prediction: I will not be able to work any more. This question about RTW has been used in the international ISSA (International Social Security Association) study (103).

4.4.2 Study III

The study aimed at describing the frequency of full, partial, and no return to work after at least 28 days of full-time sick leave, and at ascertaining the influence of work conditions and health. Outcome variables were: full return to work, partial return to work or no return to work (i.e. full-time sick leave or disability retirement). Potential predictive variables were: self-rated health, work ability, and psychosocial work conditions assessed by a questionnaire before the onset of sick leave. Physical and mental demands at work that were related to the employee's own capacity were measured by questions from the questionnaire concerning the work ability index (104).

General health was assessed by the following item: “In general, how would you describe your health? As very good, good, neither good nor poor, poor, or very poor? “. The response alternatives “very good” and “good” were classified as “good general health”.

The demand–control model was assessed by a Swedish version of the Job Content Questionnaire (105, 106). Five items were used to estimate mental workload, and six items covered decision latitude. In this study, a score of 14-20 for mental demands was considered as “high demands”, and a score of 6-17 for decision latitude was considered as “low decision latitude”. An index of social support at the workplace included six items, and a score of 13-22 was considered as “low social support” (107).

Organisational changes at work the year before the baseline and the consequences of these changes were assessed by items used in the Swedish MOA study (108), with some adaptations to the current study group. The changes at work that were asked about were: workload, time pressure, work requirements, opportunities for developing and learning new things, support, cooperation, influence and control, downsizing, job security, and involvement. Negative consequences of changes at work that were experienced were: “not being able to perform work as well as I would like to”; “not certain my competence is sufficient”, “maybe the demands will be too high”, “there will be conflicts at work” or “maybe I will lose my job”. Those reporting three or more negative consequences were classified as having negative consequences of changes at work. Poor leadership and a tendency towards social exclusion (bullying) at the workplace were assessed by single items.

Age, gender, level of occupational skill, the disorder resulting in sickness absence, and a compounded rehabilitation measure as measured in Studies I and II, were also considered in the analyses. The rehabilitation measures were considered to be an indicator of the severity of the illness.

The disorders, reported by the occupational health services, the rehabilitation clinics, or by the person on sick leave, were divided into three main categories: musculoskeletal disorders, mental disorders and other disorders and complaints. Participation in rehabilitation measures was interpreted as an indicator of the severe grade of the illness and adjusted for in the multivariate analyses.

Level of occupational skill was classified according to the International Standard Classification of Occupations (ISCO-88). The occupations were stratified into three skill levels: occupations requiring at least four years of academic education after upper secondary school (ISCO level 4), occupations requiring at least two years of education after upper secondary school (ISCO level 3) and occupations requiring less education (ISCO-level 1,2).

4.4.3 Study IV

4.4.3.1 The rehabilitation intervention

In order to strengthen the rehabilitation structures for people on long-term sick leave, the HAKuL model was developed and formed from existing organisational structures and current legislation on rehabilitation issues. The model was well anchored at the top of the organisations. The supervisors at the workplaces were given central roles in identifying the people who had reached 28 days or more of full-time sick leave and in referring them to the occupational health service (OHS) where an early team

assessment was to be carried out in order to establish a rehabilitation plan. The intervention included an offer to receive intense multimodal rehabilitation at special rehabilitation centres paid for by the project. The rehabilitation centres were all well-known centres with certified programmes, offering multimodal rehabilitation based on a bio-psycho-social model, combining a cognitive and physiotherapeutic approach and including education. The programmes most often lasted four weeks, with a follow-up after six or twelve months. In cases where the sick-listed person and the staff at the occupational health service had different opinions about the need for a multimodal rehabilitation programme, the patient's voice had precedence.

However, the intervention encountered many difficulties, such as poor reporting of people on sick leave to the OHS. Supervisors had no routines to refer employees to an assessment and we found obstacles in adapting existing computerised personnel administrative systems to give a signal at 28 days of sick leave. The project also revealed that some OHS centres were under-dimensioned and consequently were unable to meet the increased requirements of early team assessments. Countermeasures taken by the project organisation were: weekly reminders to the supervisors via email to send people on 28 days of sick leave to the OHS, direct calls from the physicians in the project organisation to those on long-term sick leave and different forms of feedback systems. These measures had effect. Nevertheless, it was not until it was decided that only people on sick leave for 90 days or more should be incorporated in the project, that the coverage of cases was good, 77% in a sub-sample, in comparison with the employers' salary registration systems.

The variables

Age was divided into three categories: younger people up to and including the age of 44, those between 45 and 54 years, and those who were 55 years or older.

Occupation was divided into professions with high versus low physical demands. The following occupations were regarded as involving high physical demands: home-based carers, assistant nurses, childcare workers, mental attendants, cleaners and kitchen staff. Registered nurses, teachers, office workers and other professions with an academic education were regarded as professions involving low physical demands.

Vocational measures comprised work training, transfer to other jobs within the same employer and/or commencement of studies.

We had data on pain and function from a short questionnaire that was sent out when the spell of sick leave had been reported to the project organisation. However, the response ratio of the questionnaire was low (54%): 424 out of 779 people answered. The questions were based on von Korff's questionnaire (102) which contains three questions about pain and function respectively. The mean of the three questions multiplied by ten gave a measure from zero to 100. In von Korff's standard instructions, pain and function were combined, but as we had different kinds of symptoms and disorders we separated pain from function.

Vocational rehabilitation, where the employers took an active part, was also of special interest. The employers are required by law to investigate whether it is possible to adapt the job assignments.

5 RESULTS

See Table II for a summary of the results from all four studies regarding RTW.

Table II: Summary of significant predictive factors for return to work found in this thesis: results from uni- and multivariate logistic regression models. Empty cell means variable was not tested.

| | Study II | | Study III | | Study IV |
|--|--|--|------------------------------------|------------------------------------|--------------------------------------|
| | Uni-variate | Multi-variate | Uni-variate | Multi-variate | Multi-variate |
| Gender | No | No | | | No |
| Age | <55 years | 45-54 years | | | <45 years |
| Own prediction of return to work | Yes | Yes | | | |
| Complaints from >1 group of symptoms | Yes | No | | | |
| Duration of complaints | < 5years | No | | | |
| Duration of sick leave | < 1 year | < 1 year | | | |
| Pain | Less than the 4 th quartile | Less than the 4 th quartile | | | |
| Function | Less than the 3 rd quartile | No | | | |
| Not physically strenuous work | Yes | No | | | Yes |
| Contact with the workplace/workmates | No | No | | | |
| Perception of being welcome back to work | Yes | Yes | | | |
| Contact with the occupational health service | No | No | | | |
| Contact with the regional social insurance officer | No | No | | | |
| Contact with the trade union | No | No | | | |
| Rehabilitation programme (at least 4h/day 4 days/week) | No | No | | | |
| Demand-control model | | | Low demands-high decision latitude | Low demands-high decision latitude | |
| Negative consequences of changes | | | | Yes, but in a negative way | |
| Bullying | | | No | No | |
| Poor leadership | | | No | No | |
| Poor social control | | | No | No | |
| Good general health | | | Yes * | Yes | |
| Physical demands at work in balance with the individual's capacity | | | Yes* | Yes* | |
| Mental demands at work in balance with the individual's capacity | | | Yes* | Yes* | |
| Problems or complaints (diagnoses) | | | | | No |
| Rehabilitation | | | | | Only vocational or no rehabilitation |

* Only for people with full return to work, not for those with partial return to work

5.1.1 Study I

The most common symptoms and disorders resulting in sickness absence were musculoskeletal problems, and mental distress, especially depression and burnout syndromes. Combinations of symptoms and disorders from different organ systems were common, and were reported by 36% of women and 26% of men.

Many had experienced their symptoms for a long time. The women had experienced their symptoms for six years (median) before the start of their sickness absence and the men for seven years.

The sick-listing time was long. More than half of the study group – to be exact, 57% of the women and 47% of the men – had been on the sick list for more than one year, and 25% of the women and 14% of the men had been sick-listed for more than two years.

There was no contact between the employer and the employee in 12% of the cases. Twenty-three percent of the women and 24% of the men did not feel welcome back to work. Personal contact and support by the regional social insurance officers were lacking for one third of the sick-listed people. Half of them had no contact with the occupational health service or the trade union.

In total, 33% of the women and 31% of the men had received compound rehabilitation. When it came to vocational training, 34% of the women and 33% of the men had been given such training.

Among those women where a rehabilitation investigation was carried out, 68% continued in rehabilitation programmes and/or vocational rehabilitation, as compared with 41% among the cases where a rehabilitation investigation was not carried out. The difference was statistically significant among women, Pearson chi-square 24.966 and $p < 0.001$. The men showed corresponding but lower figures.

One third of the study group reported that, in their own opinion, the most crucial factor for return to work was diminishing symptoms and medical problems. Less than 10% asked for a change of jobs or work tasks, education, vocational training, or help from their employer.

Sixty percent of the women and 54% of the men judged that they would return to gainful work anyhow, within a new occupation and/or with fewer working hours.

5.1.2 Study II

At the follow-up after 18 months, 135 out of 508 people (27%) had returned to work, 74 (15%) full-time and 61 (12%) part-time.

We were interested in the value of their own predictions of their future RTW. Only six out of 162 people with a negative prediction of their RTW had returned to work full- or part-time, representing a predictive value of 96%. Of 323 people who gave a positive prediction of their future return to work, 123 had returned, representing a predictive value of 38%.

The exposures from the baseline study, representing possible predictors of RTW, tested in a univariate logistic regression model, revealed the following predictive factors:

being under 55 years of age, OR 2.2 for persons between 45 and 54 years of age and OR 2.5 for persons up to 44 years of age; having made a positive prediction of their own RTW, OR 16.0; having had complaints from not more than one group of symptoms, OR 2.0; having suffered from the problems for less than five years, OR 1.8; having been on the sick list for less than one year, OR 2.7; having less pain and better function than those in the quartile with most pain or greatest impairment of function, OR for pain: 1st quartile 3.7, 2nd quartile 5.5 and 3rd quartile 2.2. OR for function: 1st quartile 2.7, 2nd quartile 2.1 and 3rd quartile 1.6; having had an occupation implying a job that was not physically strenuous, OR 1.5; perceiving that they were welcome back to work, OR 1.9.

Variables tested in the univariate logistic model that proved not to be significant were sex, contact with the workplace/workmates, contact with the occupational health service, contact with the regional social insurance officer, contact with the trade union and participation in rehabilitation programmes.

When the univariate logistic regression of the same factors was performed separately for women and men, the results were in the same direction for the two sexes with the exception of two variables; whether or not their work was physically strenuous, and whether or not they felt welcome back to work had no impact on return to work for men.

Significant exposures in the univariate model were tested in a multivariate logistic model. Five significant factors predicting return to work were found: being under 55 years of age, OR 2.37 (1.07 - 5.23) for persons 45-54 years of age and OR 1.85 (0.82 - 4.20) for persons up to 44 years of age; the individuals' own predictions of their future return to work, OR 8.28 (3.31 - 20.69); having been on the sick list for less than one year, OR 2.09 (1.19 - 3.67); having less pain than those in the quartile with most pain, 2.65 (1.21 - 5.81); feeling welcome back to work, OR 1.17 (0.65 - 2.08).

Variables that proved not to be significant in the multivariate model were: having had complaints from one or more groups of symptoms; medical problems lasting for more than five years; having had physically strenuous work or not.

5.1.3 Study III

Two years after the onset of sick leave, 77% had returned to work, 62% full-time and 15% part-time. Some of the full-time returners, 21%, had returned via a period of partial working time, while 41% had returned directly from full-time sick leave to full-time work.

Regarding age, the youngest and the oldest age groups had the best RTW rates: 83% of those 40-59 years of age had returned, and 85% of those older than 60 years of age compared with 75% of people 40-59 years of age had returned to work.

Regarding type of symptoms and complaints, 74% of those with musculoskeletal disorders and 77% of those with mental disorders had returned to work full- or part-time.

The proportion of partial RTW increased with age. Partial RTW was most common in occupations requiring at least two years of education after high school: 20% had partially returned to work compared with 13% of those in occupations requiring less

education. Regarding type of symptoms and complaints, those with mental diagnoses had the highest rate, 21%, of partial RTW; on the other hand, these had a lower rate, 56% of full RTW.

Of those who reported low job strain, 85% were back in work, fully or partially, compared with 72% of those with high job strain. Low job strain increased the odds both for full RTW (OR=2.72, 95% CI 1.60-4.62) and for partial RTW (OR=2.42, 95% CI: 1.21-4.85) compared with no RTW. Negative consequences of organisational changes gave decreased odds for full RTW (OR=0.54, 95% CI 0.38-0.77) but not for partial RTW. Bullying, social support and poor leadership reported before the onset of sick leave were not associated with full or partial RTW, compared with no RTW.

Good general health, reported by 63% before the onset of sick leave, increased the odds for full RTW (OR=2.16, 95% CI: 1.54-3.03) but not considerably for partial RTW (OR=1.35, 95% CI: 0.86-2.11). Good physical and mental work ability before the onset of sick leave showed the same pattern: it increased the odds for full RTW but not for partial RTW, compared with no RTW.

Multiple regression models

Low job strain implied increased odds both for full-time and partial RTW, even when the analysis was adjusted for age, sex, diagnosis, rehabilitation measures and level of occupational skill. When the model was additionally adjusted for self-reported health, work ability and negative consequences of organisational changes, the directions of the estimates remained but the estimated odds ratios were diluted. Negative consequences of organisational changes and good general health remained as significant factors for full RTW.

Occurrence of periods of partial RTW during two years

Of the 347 who had periods of partial RTW within two years, 176 people (50.7%, 95% CI: 45.5-55.9%) were back in full work after two years and 130 (37.5%, 95% CI: 32.5-42.7%) were still partially back at work. A smaller number, 41 people, had had periods of partial RTW but were back in full-time sick-listing.

Periods of partial RTW were more frequent among those who were 40 years of age or older, for those at a high occupational level, and for those with mental diagnoses. The frequency of periods of partial RTW was higher among females compared with men, but due to the small number of men, this observation is uncertain.

The occurrence of periods of partial RTW tended to be higher among those who reported high mental demands compared with employees with relatively low mental demands. Good self-reported health and work ability, bullying, poor social support, poor leadership and negative consequences of organisational changes, reported before the onset of sick leave, were not related to periods of partial sick-listing.

5.1.4 Study IV

In the original model, people with 28 days of sick leave were to be included in the rehabilitation programme. However, although this was well anchored in the organisation, only limited numbers were reported. A check-up against the employers' salary registration systems carried out for one year in four of the participating municipalities, revealed that only 27% of the spells lasting 28-59 days had been reported to the HAKuL organisation. For spells lasting 60-89 days 42% had been

reported, and for spells of 90 days or longer 77% had been reported to the project organisation. Because of the poor reporting regarding shorter spells of sick leave, only people with spells of sick leave for 90 days or more are investigated here.

From the study population of 9,000 employees, 947 were reported with sick leave of 90 days or more during the three-year study period. For 37 of them no reason for sick leave was given, and 90 had problems and complaints that were not in line with the inclusion criteria. At the two-year follow-up, 14 people had passed away, 9 had reached retirement age and 18 had left their jobs and were impossible to follow up.

A further 44 people had quit their jobs, but their actual status when they left was known and they remained in the study group despite a follow-up of less than two years.

The final study group comprised 779 people: 704 (90%) women and 75 (10%) men. The overall average age was 47 years (20-63). In relation to physical workload, 467 (60%) had high physical demands at work and 295 (38%) had low physical demands at work; 17 people (2%) could not be categorised.

Of the included diagnoses, musculoskeletal problems were the main causes of sickness absence, followed by psychological/stress-related problems: 412 people (53%) and 340 (44%) respectively.

In all, 168 people (22%) had participated in advanced multimodal rehabilitation programmes and 92 of these continued in vocational rehabilitation. Another 212 had only received vocational rehabilitation. Thus, totally 304 people (39%) received vocational rehabilitation.

Within the two-year follow-up period, 527 people (68%) returned to work full- or part-time: 374 (48%) full-time and 153 (20%) part-time. Many returned to full-time work via a period of part-time work. This was the case for 132 people, corresponding to 35% of all those who returned to full-time work.

5.1.4.1 The rehabilitation process

The time processes in the HAKuL model must be regarded as slow. In several variables the median is shorter than the mean. This indicates a positively skewed distribution and a “tail” of long cases, which is why the median values are selected here. The time from the first day of sickness absence to the start of the multimodal rehabilitation programme was 194 days and the time period up to RTW, for those who had the capacity to do so, was 348 days. It is notable that for this group the mean and the median values were about the same, indicating that after the programmes a decision about the person’s working capacity was made. There was no time difference regarding RTW for those with musculoskeletal problems compared with those with psychological/stress-related problems: 210 and 220 days respectively.

5.1.4.2 Who received multimodal rehabilitation programmes?

Women received more multimodal rehabilitation than men did (OR=2.62, 95% CI: 1.21-5.65). There was no significant selection to multimodal rehabilitation programmes regarding age or whether the work was strenuous or not.

5.1.4.3 Who received vocational rehabilitation?

A similar multivariate logistic regression model showed that those who were younger than 45 years of age (OR=1.63, 95% CI: 1.05-2.53) as well as those between 45 and 55

years of age (OR=1.55, 95% CI: 1.00-2.41) received more vocational rehabilitation than older people. Those with stress-related/psychological problems (OR=1.52, 95% CI: 1.08-2.14) received more vocational rehabilitation than other groups. There were no gender differences and no differences due to whether their occupation was physically strenuous or not.

5.1.4.4 Predictors for return to work

A third multivariate logistic regression model stated that predictive factors for return to work after at least 90 days of sickness absence were: being less than 45 years of age (OR=2.04, 95% CI: 1.36-3.07) and with a trend for people between 45 and 54 years of age (OR=1.48, 95% CI: 0.99-2.21), having low physical demands at work (OR=1.79, 95% CI: 1.26-2.55) and having received vocational rehabilitation (OR=3.48, 95% CI: 2.22-5.45) or no rehabilitation at all (OR=2.59, 95% CI: 1.76-3.82). Type of problems and complaints, or having received multimodal rehabilitation, did not influence the RTW.

The same multivariate logistic regression as above was tested on a selection of people with musculoskeletal problems and a selection of people with psychiatric/stress-related problems. The result was the same, except for the fact that those with psychiatric/stress-related problems who were 45-54 years of age returned to work, as did those who were younger than 45 years of age.

5.1.4.5 Scores for pain and function

Comparisons between means of scores for pain and function according to von Korff showed no differences between women and men.

People with musculoskeletal problems had more pain compared with those with psychological/stress-related problems, and also compared with those with cardiovascular and respiratory problems, and had more impaired function than those with psychological/stress-related problems. Those who had been in multimodal rehabilitation programmes also had more pain and more impaired function than people who only received vocational rehabilitation.

6 DISCUSSION

6.1 RESULTS

The most interesting finding in this thesis is that the perception of the individuals on long-term sick leave regarding their RTW had a very strong predictive value for real RTW. One of the aims of the thesis was to investigate the impact of individuals' own predictions of RTW, and this was also found to have the strongest predictive value for RTW in the included studies.

Only one single question with five alternatives of response alternatives was used to find out the participants' own predictions of their future RTW. The question was phrased: "What is your opinion about your work ability in the long term?" Four alternatives were positive predictions but with differences in professions and working hours. The fifth alternative was a negative prediction phrased: "I will not be able to work any more".

It is not until recent years that recovery expectations of patients on sick leave have seriously been taken into account as a prognostic factor for health recovery and RTW, and found predictive (42, 45, 64-66, 109-114).

Mondloch and Cole et al found a correlation, both in their review and in their interview study, between positive expectations and period of time receiving benefits (109, 115). Marhold et al concluded that patients' perceptions and beliefs about RTW might be a significant hindrance for recovery (110). The study of Ockander et al based on semi-structured interviews with 82 middle-aged women with personal experience of long-term sickness absence. The perception of their own situation and especially what they thought about their future was associated with their feeling of power to take initiatives, and their well-being (111). Brouwer et al investigated whether the subjects' expectations of their general capacities differed between subgroups of health conditions (113) and found that among other factors, only self-efficacy remained predictive in all subgroups, which included musculoskeletal problems, other physical problems and mental problems. Sampere et al studied RTW expectations in a cohort of workers with lengthy non-work-related sick leave and found that RTW expectations were an important prognostic factor for all types of health conditions (114).

The single question we used in this thesis to investigate people's own expectations concerning their RTW, has been shown to separate people on long-term sick leave into two groups with completely different predictive outcome: those with a positive prediction and a high chance of realising their RTW, and those with a negative prediction, whose statement in this study had a predictive value of 96% for not returning to work. It is obvious that these two groups start their RTW processes from different positions and that the rehabilitation interventions must be different, at least to start with. Those who do not believe in their RTW need motivational help and improvement of self-confidence to change their view of their chances of returning to work. Another alternative that should be investigated is whether they, or at least some of them, have reached the requirements for a disability pension to be granted. It might be a waste of resources and time to try to rehabilitate people who do not believe in their own RTW. From a clinical perspective, resources and efforts should be invested in the group who believe in their RTW.

The result from this thesis confirm the statement of Benight and Bandura, that no other mechanism is more central for humans than their belief in their efficacy to manage their own functioning and exercise control over events that affect their lives (63).

Franché et al regard RTW after illness or injury as a behaviour influenced by physical, psychological and social factors (45), which is an attractive perspective.

The physical predictive factors for RTW found in this thesis were: age, being in considerable pain, non-strenuous work and a self-assessment of good general health before the onset of sick leave. This was regardless of gender.

Regarding psychological factors, a feeling of being welcome back to work had a positive predictive power.

Self-assessed psychosocial factors at the workplaces before the onset of sick leave were examined in Study III. Low demands and high decision latitude at work were a combination predicting good RTW, both for full and partial RTW. Physical and mental demands at work in balance with the individual's capacity predicted full but not partial RTW.

6.1.1 Physical predictive factors for RTW

6.1.1.1 Age

In the literature, age is a well-known predictor of RTW, both for people with musculoskeletal problems (27, 116, 117) and those with mental problems (16, 110, 118, 119). In Study II in this thesis, middle-aged people between 45 and 54 years of age had returned to work to a greater extent than both younger and older ones. There was only a trend for those younger than 45 years of age to return to work (OR=1.85, 95%CI: 0.82-4.20). It is interesting that somewhat older people showed a better RTW result. One can speculate that people between 45 and 54 years of age are less burdened at home with small children and are therefore more focused on their own RTW. Voss et al found in a one-year prospective cohort of 1464 female municipal employees under 50 years of age in Sweden, that single women with children, but not married/cohabiting women, had a higher risk of repeated spells of sick leave or long-term sickness absence (120).

However, in Study IV, those younger than 45 years of age had a higher RTW rate than older people. In Study II half of the study group had been on sick leave for more than a year at study start with a follow-up after 18 months. In Study IV, people had been on sick leave for 90 days with a follow-up after two years. To conclude, those younger than 45 years of age with a sick-listing time of 90 days at study start have a greater chance of returning to work than older people. But in a cohort where many have a sick-listing time of one year at study start, it is an advantage to be between 45 and 54 years of age as far as RTW is concerned.

Despite the fact that there was a difference in design between Studies I-II and III, age was a common predictive factor. Even though it is not possible to have an influence on age, this is something to take into account. The Swedish labour force is getting older and people are expected to work after 65 years of age. We can expect to see more and more older people who require rehabilitation efforts.

6.1.1.2 Pain

Another predictive physical factor found in this thesis affecting RTW was being in considerable pain. People who perceived a great deal of pain and entered the highest quartile of self-assessed pain, returned to work to a lesser extent than others with low or more moderate levels of pain (Study II).

Our study is well in line with previous findings. Pain is often pointed out as a negative predictor of RTW (65, 116, 121-123). McGreary et al found that extremely high pain ratings after rehabilitation were most predictive of poor outcomes (121). Hoedeman et al studied 489 sick-listed employees registered within five occupational health physician group practices. Intensity of pain was measured with the SF-36 (Short Form Health Survey) (122). Pempeii et al studied 589 nursing personnel, nurses and nurses' aides with work-related back pain and found that severe pain predicted delayed RTW (123). Lydell et al conducted a 10-year follow-up of a cohort that participated in a rehabilitation programme between 1992 and 1999. A comparison was made between the group who worked full-time and the sick-listed group, and pain among other factors was found predictive of RTW (116). However, in a study of Shiri et al, who compared part-time sick leave with full-time sick leave, pain intensity was not found to predict RTW (124). In a cohort with long-standing pain and long-term sick leave, Norrefalk et al found no correlation between pain intensity and reduction of benefit level either (125).

With regard to mental disorders, the review of Cornelius et al only found limited evidence of health-related issues such as stress and shoulder/back pain and RTW (118).

The fear-avoidance model has been used to try to understand the transition from acute to chronic musculoskeletal pain (126, 127). The central concept in this model is fear of pain. Pain after an accident or movement can be linked to catastrophising, which causes fear and anxiety and avoidance behaviour in relation to movements or activities. Coutu et al conducted semi-structured interviews with 16 participants, three times, during an intensive work rehabilitation programme. They found that pain representations remained as an indicator of the type of action the participants were ready to take throughout the process (128). Flink et al tested the links between catastrophising, problem-framing and problem-solving behaviour with two possible theoretical models: the misdirected problem-solving model and the fear-anxiety-avoidance model. They found support for viewing catastrophising as a mediator of the relation between biomedical problem-framing and medically oriented problem-solving behaviour (129).

During recent years it has become possible to follow physiological processes in the brain by fMRI (functional magnetic resonance imaging). Yoshino et al found in healthy persons that subjective pain ratings and cortical responses after pain stimuli were influenced by sad emotional context, i.e. when sad faces were shown. These findings suggest that sadness can modulate neural responses to pain stimuli (130). This provides evidence of a neurophysiological correlation to pain reinforcement by emotions.

6.1.1.3 Strenuous work

The findings of this thesis confirm that strenuous work is a negative factor regarding RTW, primarily for people with musculoskeletal problems; this has also been found in other studies (27, 117, 131). Adjustment of work tasks can facilitate RTW. Johansson et al found that the likelihood of RTW increased with increased opportunities to adjust work. They found that the possibility of adjusting work to the state of health, by e. g. being able to choose among work tasks and deciding about work pace and working hours, increased both full- and part-time RTW (132). Williams et al found in a review that clinical interventions with occupational interventions, as well as early return to work/modified work interventions, were effective in achieving faster RTW (86). In another review of Carroll et al, work modifications were more effective than other interventions for people with back pain who were on long-term sick leave (133).

However, modified work as the only advice given by an occupational health physician did not influence the total duration of sick leave (134).

6.1.1.4 Perceived good health

Perceived good health before sick leave was another predictor of RTW that was found in this thesis. A person with good health from the outset probably has more strength to face new problems. It is not unusual for people with ill health to have recurrent periods of sick leave, which changes their prerequisites for RTW (135).

6.1.2 Psychological predictive factors

A psychological factor, predictive of RTW, found in this thesis was the feeling of being welcome back to work. Strunin et al interviewed 204 workers in Florida and found that half of them had experienced an indifferent or hostile attitude in response to their attempts to return to work after an occupational back injury (136). The background to employers' attitudes to disabled workers naturally varies. A worker who has caused trouble by being on sick leave, for shorter or longer periods, might not be welcome back, which can be expressed in different ways. However, the strength of the employers' efforts and willingness to try to find solutions surely both affects the result and encourages the employee to do his/her best.

In Sweden it is prohibited by law for employers to discharge employees on medical grounds. This law is intended to secure the right of the employee, but it delays the rehabilitation process in cases where the employee will not fully recover and the employer has no suitable available work tasks. To confirm this situation an investigation into alternative work tasks has to be conducted and clearly documented. Only when this has been done can the employee be dismissed due to lack of work tasks that he or she can perform. The next step for the worker is to contact the unemployment agency, where people with reduced working capacity due to medical reasons can get special help and support. However, the process from employment in the public sector to unemployment may be a protracted and emotionally difficult process for the employee.

6.1.3 Social factors

6.1.3.1 Gender

Gender does not always refer to the biological differences between men and women. It can be looked upon as a social construction with socially constructed roles, behaviours, activities and attributes that a particular society considers appropriate for men and women (World Health Organization: www.who.int/topics/gender/en).

The WHO further state that these distinct roles and behaviours may give rise to gender inequalities, i.e. differences between men and women that systematically favour one group. In turn, such inequalities may lead to inequities between men and women in terms of both health status and access to healthcare. In the medical literature, attention has been paid to gender bias, often in favour of men (137, 138).

Our studies were conducted in predominantly female contexts. In our study population of 9,000 employees, 81% were women, which is the usual gender distribution among employees in county councils and municipalities. The three biggest occupational groups were registered nurses, assistant nurses and home-based personal care workers in elderly care. In our study groups of people on long-term sickness absence in the four

studies, 90-91% were women. In Sweden it is well known that at least since 1997, women have a higher sick-listing rate than men. See Figure II.

When it comes to rates of RTW in our studies, we could not find any predictive differences in the RTW rate between men and women. In Study IV, women had more access to multimodal rehabilitation programmes than men did. The question is whether women's needs for rehabilitation were satisfied in this intervention with good access to rehabilitation, which in turn resulted in women returning to work to the same extent as men? However, the unequal gender distribution in our studies and the predominantly female context makes it difficult to draw any conclusions.

6.1.4 Psychosocial factors at work

6.1.4.1 Low demands and high decision latitude

Among the psychosocial factors at the workplace examined in Study III, the demand-control model of Karasek and Theorell was used. High demands in combination with low decision latitude, i.e. high job strain, increase the risk of health problems (139). Lidwall and Marklund showed that high-strain jobs increase the risk of long-term sickness absence in both the public and private sector in Sweden (96). Work strain has been found a significant independent predictor of a later RTW, after acute coronary syndrome (140).

In Study III in this thesis, the combination of low demands and high decision latitude, i.e. a relaxed job situation, was predictive for RTW, both full- and part-time. However, this combination does not occur so often in the public sector of social care, healthcare and education.

6.1.4.2 Physical and mental demands in balance with capacity

Physical and mental demands at work in balance with the individual's capacity, predicted full but not partial RTW. It is understandable that a mismatch between demands and capacity causes work stress and can serve both as a gateway to poor health and a barrier to resuming work. In addition to the interplay between demands and control, there is an interplay between demands and capacity, and it is stressful when demands are not adjusted to the individual's capacity.

6.1.4.3 Negative consequences of organisational changes

Organisational changes are common in working life. During the 1990s there were extensive changes in the Swedish labour market. Lidwall et al examined risk factors for long-term sick leave before and after these changes. They found that after the 1990s, long-term sick leave was more strongly associated with various aspects of the psychosocial work environment and job situations (141). Previous studies in the HAKuL project show that negative consequences of organisational changes increase the risk of both long-term sick leave and of terminating an employment contract (142, 143). Study III in this thesis revealed that perceived negative consequences of organisational changes at work before long-term sick leave were associated with a decreased probability of full RTW. Fishbain et al also found a relationship between pre-injury job perceptions and actual RTW after pain facility treatment (64)

6.1.5 Rehabilitation

6.1.5.1 Rehabilitation support in Study I

Only half of the study group had undergone the rehabilitation investigation which was required by law at that time. Less than half of them had been in contact with rehabilitation actors connected to the workplace, the OHS or the trade union. In spite of this, 60% of the women and 54% of the men had a positive view of their future RTW. Our conclusion was that there was a great potential for improvements in rehabilitation at the workplace arena. This gave rise to the rehabilitation intervention.

6.1.5.2 The rehabilitation intervention

The rehabilitation intervention comprised a multidisciplinary team assessment at the OHS, where an individual rehabilitation plan was drawn up. The project included an offer of referral to an advanced multimodal rehabilitation programme, free of charge. It was of interest to follow what happened in a context which provided good access to rehabilitation measures.

We made a distinction between multimodal rehabilitation, which is regarded as a medical rehabilitation, and vocational rehabilitation, where the employer has an important role. Vocational rehabilitation comprised work training, transfer to other jobs within the same employer and/or commencement of studies.

A total of 168 people (22%) participated in advanced multimodal rehabilitation programmes and 92 of these continued in vocational rehabilitation. A further 212 had only received vocational rehabilitation. In all, 304 people (39%) received vocational rehabilitation. In a report from the government in 2000, it was estimated that 55% of people on sick leave for more than 30 days, including all diagnoses, require vocational rehabilitation (144). It is impossible to make a statement about the real need for vocational rehabilitation, but it seems more probable that our figures of around 40% mirror the need in the public sector better than the more general estimation in the governmental report.

Who received multimodal and vocational rehabilitation respectively? Women in this study received more multimodal rehabilitation than men did. Those with musculoskeletal problems also received more multimodal rehabilitation, which is expected, as multimodal rehabilitation programmes are often tailored to meet problems of this kind.

People with psychological/stress-related problems were a group who received only vocational rehabilitation to a greater extent than people with musculoskeletal and cardiovascular/respiratory problems. To have received only vocational rehabilitation was also found to predict RTW. Of the 212 people who received only vocational rehabilitation, 163 (77%) resumed work. This can be compared with people who received a multimodal rehabilitation programme, where 84 out of 168 people (50%) resumed work. However, as can be expected, those who were referred to multimodal rehabilitation were worse off with regard to both pain and function. Nevertheless, the power of vocational rehabilitation for people with stress-related/psychological problems is something to take into account.

Another aspect is that people with musculoskeletal problems often need both multimodal and vocational rehabilitation, and still have difficulties in returning to work. Those with musculoskeletal problems should therefore be dealt with urgently, as soon

as problems emerge, to prevent them ever appearing on the list of people on long-term sick leave.

6.2 METHODOLOGICAL CONSIDERATIONS

6.2.1 General methodological considerations

All four studies in this thesis were conducted among employees in county councils and local authorities in Sweden representing the northern, middle and southern parts of Sweden and most occupations in these organisations. It was not possible to have a random selection of participating organisations, which can be seen as a limitation. It was necessary to recruit organisations with a long-standing commitment to the study, as the organisations had to take part in the rehabilitation project and other work-related preventive measures, help with administration of questionnaires, report employees on long-term sickness absence to the research group etc. In each unit of the participating municipalities and county councils, all employees without exception were invited to participate. The majority (81%) of the study population were women, which is a common gender distribution among employees in county councils and municipalities in general. However, the context is to a large extent very similar in county councils and municipalities all over the country: the same laws apply, they have the same goals to provide citizens with good service, and they are in the same often strained financial situation.

Studies I-II are cross-sectional studies and show the prevalence of the examined factors at a certain time point. There is a high prevalence of long-standing problems and complaints, which is what musculoskeletal and psychological/stress-related problems often are, in the studied population compared with an incidence study. The follow-up was carried out after 18 months. This cohort contains people who have been on sick leave for a very long time, half of them for more than a year but many for much longer than that. During this time some of them have taken part in different rehabilitation interventions but have not returned to work. In other words, this cohort contains a remaining group of difficult and severe cases, whose problems have not been solved in relation to RTW. Maybe RTW is not an ideal and realistic goal for part of this group. When the studies were conducted, there was no upper time limit for the duration of sick leave in Sweden, which might have been a contributing factor to the long duration of the periods of sick leave.

Studies III and IV are longitudinal studies where new cases have been introduced in the study group as they have reached 28 days and 90 days of full-time sick leave respectively. The inclusion of cases took place during a period of three years and with a two-year follow-up.

Differences appear in the study groups between Study II compared with Studies III and IV when looking at the RTW rates. The RTW rate in Study II was 27% (15% full-time and 12% part-time). Those in the longitudinal Study III, who were included after 28 days of full-time sick leave, had an RTW rate of 77% (62% full-time and 15% part-time) at the follow-up. In Study IV, where people were included after 90 days of full-time sick leave, the RTW rate was 68% (48% full-time and 20% part-time) at the follow-up. The figures are reasonable given the methods used.

The individual's own prediction of their RTW was of great importance for later RTW. In this study only one question was used. Other studies have often used a battery of

questions or validated questionnaires. Is one question enough? During recent years there has been a considerable interest in the topic and several studies have been published. Our findings are well in line with other studies (42, 45, 64-66, 109-111, 113, 114). The individual's own prediction is therefore something important to take into account. From a clinical standpoint it is a great advantage to have one question that can serve as a dividing line between people who have different rehabilitation needs.

The response rates in the studies must be seen as sufficiently high. In the four studies they were as follows: 69%, 65%, 71%, and 77%. The question is always if the non-responders are representative of the responders, or if there is a selection bias. Comparisons between responders and non-responders in Study I regarding sex, age and occupation did not reveal any significant differences. Dropout in Study II represented 27 of 535 people: data were missing for 17 of them, seven 7 had retired from working life and three 3 had passed away.

In Study III, information on employees' sick leave was reported from day 28 of full-time sick leave, by workplaces and supervisors, not taken from register data. There was certainly an underreporting of cases close to the cut-off point: 28 days. This could be due to lack of insight on the part of the supervisor in question; a decision made based on the fact that the reporting supervisor expected RTW soon; a wish not to disturb the person on sick leave; or time pressure in the daily work which made it hard to participate in external research projects. The dropout rate of 29% represented 234 people who did not respond to the questionnaire before the onset of sick leave, 72 who terminated their employment contract, and lack of RTW information for 42 people.

In Study IV it was possible to compare reported cases on sick leave against the salary systems carried during one year in four of the six participating municipalities, which revealed that 77% of the spells of sick leave sick that were 90 days or longer had been reported to the project organisation.

A limitation is that we did not have a comparable control group in Study IV. However, with the help of the Swedish national social insurance board, it was possible to make a selection of cases from another study conducted in Sweden during 2000-2004. The comparison group comprised employees in municipalities and county councils with 90 days of sick leave due to diagnoses similar to those in our study. However, the inclusion criterion in our study was full-time sick leave for 90 days, whereas in the latter study full-time sickness absence was only required on the first day and the rest of the days could consist of full or partial sick leave. In their follow-up after 13 months, 1896 out of 2976 (64%) had returned to work: 48% full-time and 15% part-time. The figures are quite similar to the RTW result in our study after two years where 68% had returned to work: 48% full-time and 20% part-time. To conclude, the rehabilitation intervention in Study IV did not for certain enhance RTW. However, compliance with the model was low at the beginning. Furthermore, more severe cases might have been selected to our project, as the rather expensive multimodal rehabilitation programme was free of charge.

6.2.2 Methodological considerations concerning the rehabilitation intervention

The rehabilitation intervention was launched in order to strengthen the rehabilitation structures for people on long-term sick leave. It was formed from existing systems and stakeholders, and included an offer of a multimodal rehabilitation programme. This

approach was in line with existing recommendations and evidence for good rehabilitation. However, several difficulties emerged. What went wrong?

The project seemed to be well-anchored in the organisations but should probably have been even better anchored among the supervisors. Several authors have pointed out the difficulties in carrying out interventions at workplaces (44, 145, 146). Such problems include: paying attention to the intervention itself; clarifying the selection of samples; having a theoretical basis for the intervention and having a control group; having an adequate follow-up time and appropriate statistical analyses (145, 146).

However, this study had a prospective three-year design with a two-year follow-up. There was theoretical evidence in favour of a multimodal approach, both in the assessment stage at the OHS centres and in the medical rehabilitation, and results for workplace-based interventions were promising. As mentioned, the lack of a control group was a limitation. In this study many stakeholders were involved, which as Loisel et al also found, is a barrier when it comes to interventions at workplaces (44).

It is also our experience that it is difficult to come from outside the organisation and try to implement an intervention. Such interventions probably have better penetration if the ideas come from inside the organisation and thereby are more asked for. Another reflection is that the team assessment required considerable resources and temporal cooperation. There might be an easier way to find out the needs and requirements of rehabilitation measures. As the individuals' own predictions proved to have such an impact, this could be one of the first questions. Probably the person on sick leave should have a prominent, empowered role. Empowerment supports the patients in improving and using their knowledge, skills, attitudes and self-awareness to enhance the quality of their lives (147).

6.3 GENERAL DISCUSSION

6.3.1 Partial sick leave

In Study III it was an interesting finding that partial RTW often precedes full RTW, and as such serves as part of the rehabilitation process and a step towards full RTW. Theoretically, part-time sick leave can be seen as implying a risk of prolonged part-time sick leave. However, in a context such as the Swedish one, where most women are employed in gainful work, often in the public sector, it is more probable that partial RTW serves as a long-term opportunity to remain in active work despite reduced work ability. In a study of Sieurin et al, also conducted in county councils and municipalities in Sweden, 92% of those on part-time sick leave believed that the part-time sick leave was good for them, even if many thought it had negative consequences for their employer and colleagues. The authors concluded that there is a potential for an increased degree of partial RTW in the group of people on long-term sick leave (32). Viikari-Juntura et al could confirm this in a study on people with musculoskeletal problems who were unable to perform their normal work. These people were randomly allocated to part- or full-time sick leave. For the former group, work was modified according to time at work and work duties. Total sickness absence during the twelve-month follow-up was about 20% lower in the intervention than the control group. The study shows that early part-time sick leave contributes to increased work participation (148). Further investigations of the same cohort showed that part-time sick leave did not exacerbate pain-related symptoms and functional disability, but improved self-rated general health and health-related quality of life in the early stages of work disability (124).

6.3.2 Time aspects

Study I revealed that many had experienced their symptoms for a very long time. The women had experienced their symptoms for six years (median) before the start of their sickness absence and the men for seven years. The duration of experienced symptoms was not predictive of RTW when tested in a logistic multivariate model in Study II, but the period of time on sick leave was. It was predictive of RTW to have been on the sicklist for more than a year. This was the case for 57% of the women and 47% of the men. It is not unexpected that people who have been sick-listed for more than a year have difficulties in returning to work. What is more interesting is the finding that it is possible to return to work despite being on sick leave for a period of one year or more. Out of 195 people in Study II with a positive prediction, 34 could actually resume work.

In Study IV, the median time for starting the multimodal rehabilitation in the project was 194 days, i.e. more than six months, and the time to RTW for this group was about one year. The rehabilitation process must be regarded as slow but in other comparable studies it was even slower. The time that elapsed up to the rehabilitation meeting in the Stockholm Cooperation Project conducted in the municipality of Stockholm was 233 days (149). In a study from the early 90s, Selander et al found that for people on sick leave of 90 days or more due to low back pain or neck/shoulder pain, there was a median wait for rehabilitation measures of 227 days for employed people, and 291 days for unemployed people (150).

However, the new legislation within the National Insurance Act, introducing the ‘rehabilitation chain’, which came into force on 1st July 2008, demands more immediate actions. The government has therefore established the ‘rehabilitation guarantee’, and funds are provided for people to have access to evidence-based rehabilitation efforts as soon as possible. It is possible to refer people suffering from pain problems or minor psychiatric/stress-related problems to multimodal rehabilitation teams and a trained CBT therapist with accreditation, on the condition that they do not have to wait longer than one month. Other prerequisites are that those referred are between 16 and 70 years of age and that they are referred by their GPs in primary care. To start with, the upper age limit was 65 years, but as the age for retirement has been changed, the upper age limit was changed to 70 years. The fact that it is only GPs and not specialists that can refer patients is to stress that primary care is the basis for healthcare.

6.3.3 The role of the OHS, the supervisor and the employer

Many factors in this thesis that were found predictive of RTW are connected with the work itself and workplaces: low demands and high decision latitude, physical and mental demands in balance with capacity, negative consequences of organisational changes. Factors predicting RTW in Study IV were: vocational rehabilitation and low physical demands at work. Here the OHS is a natural link and has a key position in providing and enhancing support and rehabilitation.

The OHS has unique knowledge about workplaces, both from a physical and psychosocial standpoint, and is a natural connecting link between the employee and the employer. The work of the OHS includes several tasks both in terms of prevention, as a

resource when employees need work modification or rehabilitation, and in contributing to sustained work ability (67).

Holmgren and Dahlin Ivanoff performed a focus group study with the aim of exploring supervisors' views on employer responsibility in the return to work process (151). The supervisors found themselves to be key persons, carrying the main responsibility for the rehabilitation of sick-listed employees and for creating a good work environment, thus preventing ill health and sick-listing among the employees. When it came to their view of factors influencing rehabilitation work, they mentioned aspects of society, the demands and resources of the workplace and the interplay between all parties involved (151). In another study of Janssen et al, where the demand–control–support model was tested, it was found that supervisor support was the most predictive of RTW without adjustments (152).

In Study IV, it was found that people with musculoskeletal problem have difficulty returning to work, despite considerable efforts including both multimodal and vocational rehabilitation, and should therefore be dealt with urgently as soon as problems emerge, to prevent them from ever appearing on the list of people on long-term sick leave. This is a major issue for the OHS; the alertness of OHS personnel in detecting circumstances which can be addressed has high priority and must be an ongoing and never-ending task.

One result in Study I was the fact that the rehabilitation investigation which was stipulated by law after 28 days of sick leave was often missing, but those employees that had undergone a rehabilitation investigation after 28 days of sick leave, had later had access to more multimodal rehabilitation than those who had not had a rehabilitation investigation. However, employer responsibility to perform such an investigation was withdrawn from 1st July 2008 when the new rehabilitation reform was launched. The withdrawal of the responsibility is perhaps an adjustment to real life. The possibility to make a rehabilitation investigation should be seen as a tool, and not a duty, to use when suitable in rehabilitation work. The employer still has the responsibility to try to adapt and adjust the workplace when there is a need for such measures.

The participants in Study I had been on sick leave for a long time, half of them for more than a year. They had had problems and complaints for about six years before the onset of sick leave. In spite of this, only half of them had been in touch with the OHS. From this point of view there seemed to be great potential for improvements in rehabilitation at the workplace arena. However, long-term absence from work might have been a contributory factor, but as long as there is an employer contract the employer also has responsibilities towards the employee, even if RTW seems far off.

The new legislated rehabilitation chain speeds up the rehabilitation process, which in a way is a stress factor for all involved, but it also brings about possibilities. People on long-term sick leave are no longer forgotten in their homes.

6.3.4 Examined factors that were not found predictive of RTW

Study I revealed that the most common reason for sick-listing was long-lasting musculoskeletal problems, especially neck-shoulder pain or other musculoskeletal problems, and mental problems, especially depressions. This is the situation all over the developed world (14-21). In Study II we chose to examine whether a combination of

symptoms and complaints was predictive of RTW. This was the case in the univariate logistic regression model, but the relevance disappeared when tested multivariate. In Study IV, the three groups of problems and complaints: musculoskeletal, psychological/stress-related and cardiovascular/respiratory, were tested against RTW, and none were found predictive of RTW.

Duration of the complaints did not prove to be predictive of RTW in Study II either. However, it is thought-provoking that so many years, here about six years, precede the long-term sick leave; this is time that could be used for rehabilitation measures in order to stop the progression of the symptoms.

Contact with the workplace/workmates, with the occupational health service, with the regional social insurance officer and the trade union, did not prove to be predictive in the cross-sectional Study II. In spite of these findings, early communication with and between stakeholders who can help people on sick leave in different ways is regarded important. In the Manitoba Work Ready Study, perceived barriers to RTW included delays of all kinds in processing or delivering information or treatment, and ineffective communication (99).

6.3.5 To round off

The studies were conducted between 1999/2000 and 30th June 2005. During these years the number of new cases of long-term sick leave increased incredibly in Sweden, to an all time high in 2002, and most of all in the public sector. This means that these studies were conducted during a very interesting period of time in the history of Swedish social insurance, and might contribute to an increased international interest, where growing demands in working life together with an ineffective rehabilitation system might have contributed to the increase in numbers of people on long-term sick leave.

7 CONCLUSION

According to the studies in this thesis, the ideal situation for people on long-term sick leave is as follows. They should have self-assessed good health before the onset of sick leave, low demands and high decision latitude at work, and a job that is not physically strenuous. They should not have experienced negative consequences in connection with organisational changes, their own predictions of their RTW should be positive, and they should not have a very high intensity of pain. They should have a sick-listing time of less than one year, be younger than 55 years of age, have a feeling of being welcome back to work, and those with psychological or stress-related problems should have access to vocational rehabilitation. However, these ideal circumstances are not so often seen for workers in the public sector in municipalities and county councils.

After all, the best thing is to try and prevent poor health. The role of supervisors, OHSs and employers is important in detecting problems and circumstances early on, and in keeping an eye on the psychosocial climate and other environmental factors at work, in order to prevent long-standing work strain and long-term sick leave.

It is of great importance that people with musculoskeletal problems are taken seriously early on. When they are finally on long-term sick leave, considerable efforts are needed to help them resume work.

The most important finding in this thesis is the impact of sick-listed individuals' own perception of their future RTW. Only one question is required and it is essential to find out if the answer is yes or no, in order to tailor rehabilitation measures. People who do not believe in their future RTW need motivational help most of all and before traditional rehabilitation interventions. Some of them might have extended impairments and be in need of a disability pension.

Vocational rehabilitation is a favourable treatment for people with stress-related/psychological problems.

Part-time sick leave often functions as part of the rehabilitation process and can enhance full RTW.

Interventions at the workplaces are difficult to accomplish. The HAKuL model of rehabilitation can be used in a wider context, but it is important to consider the structures in the cooperation and use of available resources in advance. A team assessment at the OHS might better serve as a resource for selected cases.

8 FUTURE RESEARCH

- It would be interesting to test different rehabilitation methods based on the answers given by individuals to the question about their own perceptions concerning their future RTW.
- It would also be valuable to study the impact of patient empowerment in rehabilitation contexts.
- Many women are working in municipalities and county councils, and we know that the age of the workforce is continuously rising. The next challenge might be to keep these women working as long as possible.

9 ACKNOWLEDGEMENTS

The work for this thesis was financially supported by AFA Labour Market Insurances.

I would like to express my gratitude and appreciation to all of you who have helped me and encouraged me during these years. It has been a long process interspersed with clinical work at different workplaces and I have met many people who have supported me in different ways. Special thanks to:

Eva Vingård, my supervisor, for your patience, encouragement, efficiency, generosity and hospitality. Thank you for your initiatives and arrangements in connection with our "writing-days" in France, where we could take a swim between the discussions, and in your beautiful garden in Simrishamn. You have shared not only your scientific competence with me and the other PhD students, but also invited us into your private sphere and interests! You have helped me arrange accommodation in Uppsala and with much more than can ever be expected from a supervisor.

Malin Josephson, my co-supervisor, for always being positive, helpful and having time for questions. You have introduced me to critical scientific thinking, which is not an easy topic.

Irene Jensen, my second co-supervisor, with whom I share "rehabilitation thinking" and who has been a sounding board on certain occasions.

Kristina Alexanderson, for your positive attitude and helpfulness whenever I have been in touch with the Division of Insurance Medicine.

Marianne Ekdahl, the project co-ordinator of the HAKuL project, for your support during many years, for your never-ending work in collecting and adding data to our databases. Without you there would never have been a thesis!

Christian Garheden, technician and computer expert, for your instant and effective support when it is needed the most! Thank you so much!

Stefan Stark, statistician, for your positive attitude and your willingness and ability to slowly and clearly explain how to make the calculations. You have made my life easier.

Margareta Voss, for friendship and for help in comparing our figures on sick leave with those in the salary system.

Per Lindberg, for being such a positive and good friend and furthermore a good cook! I hope to see more of you and Ola!

Mustafa Ghaffari, for friendship, support and interesting discussions. You have increased my understanding of quickly developing countries such as Iran. Thank you for your help in collecting signatures from assigned persons when I applied to defend my thesis. Thanks also to your wife Elham.

Hilary Hocking, for your excellent language revision of my manuscripts. Clear and correct language is essential when communicating research, and it is always a pleasure

to make the corrections according to your advice. Your support and flexible working hours during the final throes of writing this thesis were invaluable!

Lars Alfredsson, for your willingness to share your competence with me and for enjoyable discussions.

Riitta Hölttä, secretary at “Myntet”, for your open attitude and generosity.

Anna Lundgren-Kvist, for your laughter, for help in detecting data about rehabilitation that seemed difficult to interpret, and for your positive attitude that has always made me happy.

Tove Kongsvold, for your help with my first poster.

Thanks to all my old workmates at Myntet. I appreciated the warm positive attitude among you all.

Åke Nygren and Marie Åsberg, who I met now and then, and had a quick word with, often in the doorway.

Eva Skillgate, for giving me the opportunity to learn more about naprapathy.

Henning and Karin Rodhe, whom I regularly visited and stayed with during my trips to Stockholm over a period of several years. Thank you for your hospitality and for letting me come into your family! Also special thanks to Henning who never stopped asking me about the date when I was going to defend my thesis.

Akbar Alipor, as a representant for the international arena of research.

Leif Sieurin, for friendship, support and many interesting discussions. I hope that our long-planned family trip to Copenhagen will come true one day. And thank you for your introduction to bowling.

Thank you to all my workmates at my temporary workplace in Uppsala, where I met a great deal of interest, knowledge, friendship and joy.

Special thanks to Åsa Stöllman, for good friendship and good cooperation in our work with the qualitative report.

Special thanks also to Margaretha Torgén, for interesting discussions about rehabilitation and interventions at workplaces. Thank you for taking me and my other workmates out to the theatre.

Thank you to all my former workmates in Karlshamn, where I worked for some years. Special thanks to my former boss and colleague, Katharina Prenzlau-Johansson, Charlotte Malm, Monica Nobach and my dear colleagues Charlotte Berg and Lena Sandin-Wranker, for support, engagement and interesting discussions.

Thanks to all my workmates on my home ground and at my current workplaces:

Adaptus Rehab AB, with Brita Larsson, Karoline Karlsson, Åsa Osberg, Petra Kylbo, Sandra Nolin-Svensson, Carina Bjerling, Eva-Lott Jönsson, Patrick Öberg, Glenn Rydberg and Mikael Öberg for understanding and patience, and to all my workmates at the Primary Care Center in Tollarp. Thanks also to Ole Malmberg for your interest.

Special thanks to:

Brita Larsson, my workmate in north-east Skåne for many years, for long-standing support, understanding, excellent cooperation, readiness to always find solutions, for your good heart and for your initiative in starting the "chocolate fund".

Ingemar Andersson, for valuable scientific support and encouragement on my home ground. You helped me to regain skills and confidence in working with the computerised statistics after a period of standstill. You have in many ways served as my mentor. Thank you very much!

Lena Nilsson, my current boss at the Primary Care Center in Tollarp, for your calmness, understanding and empathy.

Christer Petersén, for instant help when I had my big computer crash one week before my deadline.

On my home ground I would like to thank "matlaget": Arne Tegnér, Karin Arén, Hasse and Eva Cronert, Ulf and Susanne Sjölin, Tomas Andersson and Ingemar Holgersson and Christina Nordqvist. We have regularly met and had dinner together for about 25 years. On special occasions "matlaget" is extended and includes Håkan and Gunborg Johansson, Erland Bååt, and Kerstin Arnlind. Thank you for friendship, understanding, good food and many engaging discussions. Also, thanks to all the "matlagsbarnen".

Special thanks to:

Our families in Haväng and Furuboda, for encouragement and interest.

Thanks to Marina Liamina and Olga Paltanaviciene-Karlsson, for help, friendship, joy and care.

Thanks to Vita Jumike, for kind assistance with paper work when you were in Sweden.

And now what is most important in my life – the family.

My beloved husband Erik, who with great patience has followed this long-drawn-out process from becoming a PhD student right up to the defence of the thesis and is longing for life "afterwards", and for a home without papers and articles in every room. Thank you for your understanding, encouragement and all the good meals you have served! Soon I'll be with you out in the countryside, watching birds again!

To our two children, Maria and Sven, who have become trustworthy grown-ups while I have been writing my thesis. Thank you for your enthusiasm, understanding, joy, support and love just when I needed it the most. You are the future!

To Maria's boyfriend, "Fredri" Tischhauser, for interest, support and for the picture on the front cover.

To my sisters "Bitte" and Berit, for our annual visit to a "spa" without partners, and for interesting discussions and reflections about rehabilitation and life in general.

To my beloved parents Bo and Barbro, for always supporting me whatever happens. Somehow you are the ones who have given me the courage to ever start this process, and I am happy that you have had the opportunity to be there with me all the way right up to the public defence of my thesis.

10 REFERENCES

1. Barrero LH, Hsu YH, Terwedow H, Perry MJ, Dennerlein JT, Brain JD, et al. Prevalence and physical determinants of low back pain in a rural Chinese population. *Spine*. 2006;31(23):2728-34. Epub 2006/11/02.
2. Dagenais S, Caro J, Haldeman S. A systematic review of low back pain cost of illness studies in the United States and internationally. *The spine journal : official journal of the North American Spine Society*. 2008;8(1):8-20. Epub 2008/01/01.
3. Ghaffari M, Alipour A, Farshad AA, Yensen I, Vingard E. Incidence and recurrence of disabling low back pain and neck-shoulder pain. *Spine*. 2006;31(21):2500-6. Epub 2006/10/07.
4. Louw QA, Morris LD, Grimmer-Somers K. The prevalence of low back pain in Africa: a systematic review. *BMC musculoskeletal disorders*. 2007;8:105. Epub 2007/11/03.
5. Oksuz E. Prevalence, risk factors, and preference-based health states of low back pain in a Turkish population. *Spine*. 2006;31(25):E968-72. Epub 2006/12/02.
6. Suka M, Yoshida K. The national burden of musculoskeletal pain in Japan: Projections to the year 2055. *The Clinical journal of pain*. 2009;25(4):313-9. Epub 2009/07/11.
7. Woolf AD. The bone and joint decade 2000-2010. *Annals of the rheumatic diseases*. 2000;59(2):81-2. Epub 2000/02/09.
8. Woolf AD, Pfleger B. Burden of major musculoskeletal conditions. *Bulletin of the World Health Organization*. 2003;81(9):646-56. Epub 2004/01/09.
9. Hoy DG, Bain C, Williams G, March L, Brooks P, Blyth F, et al. A systematic review of the global prevalence of low back pain. *Arthritis and rheumatism*. 2012. Epub 2012/01/11.
10. Cote P, Kristman V, Vidmar M, Van Eerd D, Hogg-Johnson S, Beaton D, et al. The prevalence and incidence of work absenteeism involving neck pain: a cohort of Ontario lost-time claimants. *Journal of manipulative and physiological therapeutics*. 2009;32(2 Suppl):S219-26. Epub 2009/03/11.
11. Woolf AD, Akesson K. Understanding the burden of musculoskeletal conditions. The burden is huge and not reflected in national health priorities. *BMJ*. 2001;322(7294):1079-80. Epub 2001/05/05.
12. Prince M, Patel V, Saxena S, Maj M, Maselko J, Phillips MR, et al. No health without mental health. *Lancet*. 2007;370(9590):859-77. Epub 2007/09/07.
13. Wittchen HU, Jacobi F. Size and burden of mental disorders in Europe--a critical review and appraisal of 27 studies. *European neuropsychopharmacology : the journal of the European College of Neuropsychopharmacology*. 2005;15(4):357-76. Epub 2005/06/18.
14. Fulton-Kehoe D, Franklin G, Weaver M, Cheadle A. Years of productivity lost among injured workers in Washington state: modeling disability burden in workers' compensation. *American journal of industrial medicine*. 2000;37(6):656-62. Epub 2000/05/08.
15. Hansson EK, Hansson TH. The costs for persons sick-listed more than one month because of low back or neck problems. A two-year prospective study of Swedish patients. *European spine journal : official publication of the European Spine Society, the European Spinal Deformity Society, and the European Section of the Cervical Spine Research Society*. 2005;14(4):337-45. Epub 2004/05/20.

16. Hensing G, Wahlstrom R. Swedish Council on Technology Assessment in Health Care (SBU). Chapter 7. Sickness absence and psychiatric disorders. *Scandinavian journal of public health Supplement*. 2004;63:152-80. Epub 2004/10/30.
17. Westerlund H, Alexanderson K, Akerstedt T, Magnusson Hanson L, Theorell T, Kivimaki M. Work-related sleep disturbances and sickness absence in the Swedish working population, 1993-1999. *Sleep*. 2008;31(8):1169-77. Epub 2008/08/22.
18. Vaez M, Rylander G, Nygren A, Asberg M, Alexanderson K. Sickness absence and disability pension in a cohort of employees initially on long-term sick leave due to psychiatric disorders in Sweden. *Social psychiatry and psychiatric epidemiology*. 2007;42(5):381-8. Epub 2007/04/24.
19. Alexanderson K, Kivimaki M, Ferrie JE, Westerlund H, Vahtera J, Singh-Manoux A, et al. Diagnosis-specific sick leave as a long-term predictor of disability pension: a 13-year follow-up of the GAZEL cohort study. *Journal of epidemiology and community health*. 2012;66(2):155-9. Epub 2011/10/18.
20. Foss L, Gravseth HM, Kristensen P, Claussen B, Mehlum IS, Knardahl S, et al. The impact of workplace risk factors on long-term musculoskeletal sickness absence: a registry-based 5-year follow-up from the Oslo health study. *Journal of occupational and environmental medicine / American College of Occupational and Environmental Medicine*. 2011;53(12):1478-82. Epub 2011/11/15.
21. Roelen CA, Koopmans PC, Hoedeman R, Bultmann U, Groothoff JW, van der Klink JJ. Trends in the incidence of sickness absence due to common mental disorders between 2001 and 2007 in the Netherlands. *European journal of public health*. 2009;19(6):625-30. Epub 2009/07/08.
22. RFV TNSIB. Långtidssjukskrivna - bakgrund, diagnos och återgång i arbete. (In Swedish) (Long-term sick leave - background, diagnoses and return to work). Stockholm: 2000.
23. RFV TNSIB. Långtidssjukskrivna - diagnos, yrke, arbetsgivare och återgång i arbete. (In Swedish) Long-term sickness absentees - diagnoses, professions, employer and return to work). Stockholm: 2002.
24. Marklund S, Bjurvald M, Hogstedt C, Palmer E, Theorell T. Den höga sjukfrånvaron - problem och lösningar. (In Swedish) (The high incidence of sickness absence - problems and solutions). Stockholm: 2005.
25. Försäkringskassan. Nya ohälsomått inom sjukförsäkringen (In Swedish) (New standards for measurements of poor health within the general social insurance). <http://www.forsakringskassan.se>: 2011.
26. Försäkringskassan. Långtidssjukskrivna. Beskrivande statistik 1999-2009: kön, ålder, arbetsmarknadsstatus, sjukskrivningslängd och diagnospanorama. (In Swedish) (Long-term sickness absence. Descriptive statistics 1999-2009: gender, age, employed/unemployed, duration of sick leave, and diagnoses). <http://www.forsakringskassan.se>: 2010.
27. Hansson T, Jensen I. Swedish Council on Technology Assessment in Health Care (SBU). Chapter 6. Sickness absence due to back and neck disorders. *Scandinavian journal of public health Supplement*. 2004;63:109-51. Epub 2004/10/30.
28. Nyman K, Bergendorff S, Palmer E. Den svenska sjukan - sjukfrånvaro i åtta länder. (In Swedish) (Sickness absence in eight countries). Stockholm: 2002.
29. Vingard E, Alexanderson K, Norlund A. Swedish Council on Technology Assessment in Health Care (SBU). Chapter 9. Consequences of being on sick leave. *Scandinavian journal of public health Supplement*. 2004;63:207-15. Epub 2004/10/30.
30. Ockander m, Timpka T. A femal lay perspective on the establishment of long-term sickness absence. *Int J Soc Welfare*. 2001;10:74-9.
31. Floderus B, Goransson S, Alexanderson K, Aronsson G. Self-estimated life situation in patients on long-term sick leave. *Journal of rehabilitation medicine : official*

- journal of the UEMS European Board of Physical and Rehabilitation Medicine. 2005;37(5):291-9. Epub 2005/10/06.
32. Sieurin L, Josephson M, Vingard E. Positive and negative consequences of sick leave for the individual, with special focus on part-time sick leave. *Scandinavian journal of public health*. 2009;37(1):50-6. Epub 2009/01/15.
33. Polatin PB, Kinney RK, Gatchel RJ, Lillo E, Mayer TG. Psychiatric illness and chronic low-back pain. The mind and the spine--which goes first? *Spine*. 1993;18(1):66-71. Epub 1993/01/01.
34. Von Korff M, Simon G. The relationship between pain and depression. *The British journal of psychiatry Supplement*. 1996(30):101-8. Epub 1996/06/01.
35. Fishbain DA, Cutler R, Rosomoff HL, Rosomoff RS. Chronic pain-associated depression: antecedent or consequence of chronic pain? A review. *The Clinical journal of pain*. 1997;13(2):116-37. Epub 1997/06/01.
36. Maxwell TD, Gatchel RJ, Mayer TG. Cognitive predictors of depression in chronic low back pain: toward an inclusive model. *Journal of behavioral medicine*. 1998;21(2):131-43. Epub 1998/05/20.
37. Rush AJ, Polatin P, Gatchel RJ. Depression and chronic low back pain: establishing priorities in treatment. *Spine*. 2000;25(20):2566-71. Epub 2000/10/18.
38. Dersh J, Polatin PB, Gatchel RJ. Chronic pain and psychopathology: research findings and theoretical considerations. *Psychosomatic medicine*. 2002;64(5):773-86. Epub 2002/09/25.
39. Gayman MD, Brown RL, Cui M. Depressive symptoms and bodily pain: The role of physical disability and social stress. *Stress and health : journal of the International Society for the Investigation of Stress*. 2011;27(1):52-3. Epub 2011/03/02.
40. Franche RL, Carnide N, Hogg-Johnson S, Cote P, Breslin FC, Bultmann U, et al. Course, diagnosis, and treatment of depressive symptomatology in workers following a workplace injury: a prospective cohort study. *Canadian journal of psychiatry Revue canadienne de psychiatrie*. 2009;54(8):534-46. Epub 2009/09/04.
41. Zieger M, Schwarz R, Konig HH, Harter M, Riedel-Heller SG. Depression and anxiety in patients undergoing herniated disc surgery: relevant but underresearched - a systematic review. *Central European neurosurgery*. 2010;71(1):26-34. Epub 2010/01/23.
42. Iles RA, Davidson M, Taylor NF. Psychosocial predictors of failure to return to work in non-chronic non-specific low back pain: a systematic review. *Occupational and environmental medicine*. 2008;65(8):507-17. Epub 2008/04/18.
43. Krause N, Frank JW, Dasinger LK, Sullivan TJ, Sinclair SJ. Determinants of duration of disability and return-to-work after work-related injury and illness: challenges for future research. *American journal of industrial medicine*. 2001;40(4):464-84. Epub 2001/10/13.
44. Loisel P, Buchbinder R, Hazard R, Keller R, Scheel I, van Tulder M, et al. Prevention of work disability due to musculoskeletal disorders: the challenge of implementing evidence. *Journal of occupational rehabilitation*. 2005;15(4):507-24. Epub 2005/10/29.
45. Franche RL, Krause N. Readiness for return to work following injury or illness: conceptualizing the interpersonal impact of health care, workplace, and insurance factors. *Journal of occupational rehabilitation*. 2002;12(4):233-56. Epub 2002/10/23.
46. Krause N, Ragland DR. Occupational disability due to low back pain: a new interdisciplinary classification based on a phase model of disability. *Spine*. 1994;19(9):1011-20. Epub 1994/05/01.
47. Prochaska JO, DiClemente CC, Norcross JC. In search of how people change. Applications to addictive behaviors. *The American psychologist*. 1992;47(9):1102-14. Epub 1992/09/01.

48. Folkman S, Lazarus RS. The relationship between coping and emotion: implications for theory and research. *Soc Sci Med.* 1988;26(3):309-17. Epub 1988/01/01.
49. Lazarus RS. From psychological stress to the emotions: a history of changing outlooks. *Annual review of psychology.* 1993;44:1-21. Epub 1993/01/01.
50. Rotter JB, Mulry RC. Internal versus external control of reinforcement and decision time. *Journal of personality and social psychology.* 1965;2(4):598-604. Epub 1965/10/01.
51. Lefcourt HM. Internal versus external control of reinforcement: a review. *Psychological bulletin.* 1966;65(4):206-20. Epub 1966/04/01.
52. Seeman M, Lewis S. Powerlessness, health and mortality: a longitudinal study of older men and mature women. *Soc Sci Med.* 1995;41(4):517-25. Epub 1995/08/01.
53. Antonovsky A. *Health, stress and coping.* San Fransisco: Jossey-Bass; 1979.
54. Antonovsky A. *Unraveling the Mystery of Health.* San Fransisco: Jossey-Bass; 1987.
55. Antonovsky A. The structure and properties of the sense of coherence scale. *Soc Sci Med.* 1993;36(6):725-33.
56. Lindström B, Eriksson M. Salutogenesis. Glossary. *Journal of epidemiology and community health.* 2005;59:440-2.
57. Eriksson M, Lindström B. Validity of Antonovsky's sense of coherence scale: a systematic review. *Journal of epidemiology and community health.* 2005;59:460-6.
58. Eriksson M, Lindström B. Antonovsky's sense of coherence scale and the relation with health: a systematic review. *Journal of epidemiology and community health.* 2006;60:376-81.
59. Berglind H, Gerner U. Motivation and return to work among the long-term sicklisted: an action theory perspective. *Disability and rehabilitation.* 2002;24(14):719-26.
60. Berglind H. Action theory: a tool for understanding in social work. *Scand J of Social Welfare.* 1992;1:28-35.
61. Berglind H. *Handlingsteori och mänskliga interaktioner.* (In Swedish) (Action theory and human relations). Stockholm: Natur och Kultur; 1995.
62. Bandura A. Self-efficacy: toward a unifying theory of behavioral change. *Psychological review.* 1977;84(2):191-215. Epub 1977/03/01.
63. Benight CC, Bandura A. Social cognitive theory of posttraumatic recovery: the role of perceived self-efficacy. *Behaviour research and therapy.* 2004;42(10):1129-48. Epub 2004/09/08.
64. Fishbain DA, Cutler RB, Rosomoff HL, Khalil T, Steele-Rosomoff R. Impact of chronic pain patients' job perception variables on actual return to work. *The Clinical journal of pain.* 1997;13(3):197-206. Epub 1997/09/26.
65. Heymans MW, de Vet HC, Knol DL, Bongers PM, Koes BW, van Mechelen W. Workers' beliefs and expectations affect return to work over 12 months. *Journal of occupational rehabilitation.* 2006;16(4):685-95. Epub 2006/10/26.
66. Baril R, Clarke J, Friesen M, Stock S, Cole D. Management of return-to-work programs for workers with musculoskeletal disorders: a qualitative study in three Canadian provinces. *Soc Sci Med.* 2003;57(11):2101-14. Epub 2003/09/27.
67. SOU. *Framgångsrik företagshälsovård - möjligheter och metoder* (In Swedish) (Successful Occupational Health Services - facilitators and methods). Stockholm: 2011.
68. Flor H, Fydrich T, Turk DC. Efficacy of multidisciplinary pain treatment centers: a meta-analytic review. *Pain.* 1992;49(2):221-30. Epub 1992/05/01.
69. Guzman J, Esmail R, Karjalainen K, Malmivaara A, Irvin E, Bombardier C. Multidisciplinary bio-psycho-social rehabilitation for chronic low back pain. *Cochrane Database Syst Rev.* 2002(1):CD000963. Epub 2002/03/01.

70. van Tulder MW, Ostelo R, Vlaeyen JW, Linton SJ, Morley SJ, Assendelft WJ. Behavioral treatment for chronic low back pain: a systematic review within the framework of the Cochrane Back Review Group. *Spine*. 2001;26(3):270-81. Epub 2001/02/27.
71. SBU. Summary and conclusions of the SBU-report: Rehabilitation of patients with chronic pain conditions. A systematic review. Systematic review. Stockholm: Swedish Council on Health Technology Assessment, 2010 May 2010. Report No.
72. SBU. Metoder för behandling av långvarig smärta. (Methods of treating chronic pain). A systematic review. Stockholm: Swedish Council on Technology Assessment, 2006.
73. Elfving B, Asell M, Ropponen A, Alexanderson K. What factors predict full or partial return to work among sickness absentees with spinal pain participating in rehabilitation? *Disability and rehabilitation*. 2009;31(16):1318-27. Epub 2009/03/19.
74. Norrefalk JR, Linder J, Ekholm J, Borg K. A 6-year follow-up study of 122 patients attending a multiprofessional rehabilitation programme for persistent musculoskeletal-related pain. *International journal of rehabilitation research Internationale Zeitschrift für Rehabilitationsforschung Revue internationale de recherches de readaptation*. 2007;30(1):9-18. Epub 2007/02/13.
75. Busch H, Bodin L, Bergstrom G, Jensen IB. Patterns of sickness absence a decade after pain-related multidisciplinary rehabilitation. *Pain*. 2011;152(8):1727-33. Epub 2011/04/22.
76. Hoffman BM, Papas RK, Chatkoff DK, Kerns RD. Meta-analysis of psychological interventions for chronic low back pain. *Health psychology : official journal of the Division of Health Psychology, American Psychological Association*. 2007;26(1):1-9. Epub 2007/01/11.
77. Netterstrom B, Bech P. Effect of a multidisciplinary stress treatment programme on the return to work rate for persons with work-related stress. A non-randomized controlled study from a stress clinic. *BMC public health*. 2010;10:658. Epub 2010/11/03.
78. Linton SJ, Ryberg M. A cognitive-behavioral group intervention as prevention for persistent neck and back pain in a non-patient population: a randomized controlled trial. *Pain*. 2001;90(1-2):83-90. Epub 2001/02/13.
79. Durham RC, Chambers JA, Power KG, Sharp DM, Macdonald RR, Major KA, et al. Long-term outcome of cognitive behaviour therapy clinical trials in central Scotland. *Health Technol Assess*. 2005;9(42):1-174. Epub 2005/11/04.
80. Lagerveld SE, Blonk RW, Brenninkmeijer V, Wijngaards-de Meij L, Schaufeli WB. Work-focused treatment of common mental disorders and return to work: a comparative outcome study. *Journal of occupational health psychology*. 2012;17(2):220-34. Epub 2012/02/09.
81. Jonsbu E, Dammen T, Morken G, Moum T, Martinsen EW. Short-term cognitive behavioral therapy for non-cardiac chest pain and benign palpitations: a randomized controlled trial. *Journal of psychosomatic research*. 2011;70(2):117-23. Epub 2011/01/26.
82. Hesser H, Weise C, Westin VZ, Andersson G. A systematic review and meta-analysis of randomized controlled trials of cognitive-behavioral therapy for tinnitus distress. *Clinical psychology review*. 2011;31(4):545-53. Epub 2011/01/18.
83. Cully JA, Stanley MA, Deswal A, Hanania NA, Phillips LL, Kunik ME. Cognitive-behavioral therapy for chronic cardiopulmonary conditions: preliminary outcomes from an open trial. *Primary care companion to the Journal of clinical psychiatry*. 2010;12(4). Epub 2010/11/19.

84. Hoefsmit N, Houkes I, Nijhuis FJ. Intervention Characteristics that Facilitate Return to Work After Sickness Absence: A Systematic Literature Review. *Journal of occupational rehabilitation*. 2012. Epub 2012/04/06.
85. Williams RM, Westmorland M. Perspectives on workplace disability management: a review of the literature. *Work*. 2002;19(1):87-93. Epub 2002/11/28.
86. Williams RM, Westmorland MG, Lin CA, Schmuck G, Creen M. Effectiveness of workplace rehabilitation interventions in the treatment of work-related low back pain: a systematic review. *Disability and rehabilitation*. 2007;29(8):607-24. Epub 2007/04/25.
87. Franche RL, Cullen K, Clarke J, Irvin E, Sinclair S, Frank J. Workplace-based return-to-work interventions: a systematic review of the quantitative literature. *Journal of occupational rehabilitation*. 2005;15(4):607-31. Epub 2005/10/29.
88. van Oostrom SH, Anema JR, Terluin B, Venema A, de Vet HC, van Mechelen W. Development of a workplace intervention for sick-listed employees with stress-related mental disorders: Intervention Mapping as a useful tool. *BMC health services research*. 2007;7:127. Epub 2007/08/19.
89. van Oostrom SH, van Mechelen W, Terluin B, de Vet HC, Anema JR. A participatory workplace intervention for employees with distress and lost time: a feasibility evaluation within a randomized controlled trial. *Journal of occupational rehabilitation*. 2009;19(2):212-22. Epub 2009/03/25.
90. van der Klink JJ, Blonk RW, Schene AH, van Dijk FJ. Reducing long term sickness absence by an activating intervention in adjustment disorders: a cluster randomised controlled design. *Occupational and environmental medicine*. 2003;60(6):429-37. Epub 2003/05/29.
91. Briand C, Durand MJ, St-Arnaud L, Corbiere M. How well do return-to-work interventions for musculoskeletal conditions address the multicausality of work disability? *Journal of occupational rehabilitation*. 2008;18(2):207-17. Epub 2008/04/09.
92. Karasek R, Baker D, Marxer F, Ahlbom A, Theorell T. Job decision latitude, job demands, and cardiovascular disease: a prospective study of Swedish men. *American journal of public health*. 1981;71(7):694-705. Epub 1981/07/01.
93. Theorell T, Karasek RA, Eneroth P. Job strain variations in relation to plasma testosterone fluctuations in working men--a longitudinal study. *Journal of internal medicine*. 1990;227(1):31-6. Epub 1990/01/01.
94. de Jonge J, Bosma H, Peter R, Siegrist J. Job strain, effort-reward imbalance and employee well-being: a large-scale cross-sectional study. *Soc Sci Med*. 2000;50(9):1317-27. Epub 2000/03/23.
95. Niedhammer I, Tek ML, Starke D, Siegrist J. Effort-reward imbalance model and self-reported health: cross-sectional and prospective findings from the GAZEL cohort. *Soc Sci Med*. 2004;58(8):1531-41. Epub 2004/02/05.
96. Lidwall U, Marklund S. What is healthy work for women and men? - A case-control study of gender- and sector-specific effects of psycho-social working conditions on long-term sickness absence. *Work*. 2006;27(2):153-63. Epub 2006/09/15.
97. Regeringen. En reformerad sjukskrivningsprocess för ökad återgång i arbete. Prop. 2007/08:136. (In Swedish) (A reformed sick leave process for increased return to work. Proposition 2007/08:136). In: Socialdepartementet, editor. <http://www.regeringen.se/sb/d/108/a/101584>; Regeringskansliet; 2008.
98. Försäkringskassan. Kartläggning av försörjningskällor efter avslutad period med sjukpenning. (In Swedish) (Mapping of sources of economical maintenance after period with sickness allowances). Stockholm: 2009.
99. Friesen MN, Yassi A, Cooper J. Return-to-work: The importance of human interactions and organizational structures. *Work*. 2001;17(1):11-22. Epub 2002/11/21.

100. Bergendorff S, Hansson E, Hansson T, Palmer E, Westin M, Zetterberg C. Projektbeskrivning och undersökningsgrupp. Rygg och nacke I (In Swedish) (Project description and investigation group. Spine and neck I). Stockholm: 1997.
101. Jensen IB, Bodin L, Ljungqvist T, Gunnar Bergstrom K, Nygren A. Assessing the needs of patients in pain: a matter of opinion? *Spine*. 2000;25(21):2816-23. Epub 2000/11/07.
102. Von Korff M, Ormel J, Keefe FJ, Dworkin SF. Grading the severity of chronic pain. *Pain*. 1992;50(2):133-49. Epub 1992/08/01.
103. Bloch F, Prins R. Who returns to work and why? A six country study on work incapacity and reintegration. New Brunswick New Jersey: Transaction Publisher; 2000.
104. Tuomi K, Ilmarinen J, Jahkola A, Katajarinne L, Tulkki A. Work Ability Index. Helsinki: 1994.
105. Karasek R, Theorell T. Healthy work. New York (NY): Basic Books; 1990.
106. Waldenstrom M, Theorell T, Ahlberg G, Josephson M, Nise P, Waldenstrom K, et al. Assessment of psychological and social current working conditions in epidemiological studies: experiences from the MUSIC-Norrtaälje study. *Scandinavian journal of public health*. 2002;30(2):94-102. Epub 2002/05/25.
107. Toomingas A, Theorell T, Michelsen H, Nordemar R. Associations between self-rated psychosocial work conditions and musculoskeletal symptoms and signs. Stockholm MUSIC I Study Group. *Scandinavian journal of work, environment & health*. 1997;23(2):130-9. Epub 1997/04/01.
108. Härenstam A, Karlqvist L, Bodin L, Nise G, Schéele P, al. e. Patterns of working and living conditions: a holistic and multivariate approach to occupational health studies. *Work Stress*. 2003;17:2073-92.
109. Cole DC, Mondloch MV, Hogg-Johnson S. Listening to injured workers: how recovery expectations predict outcomes--a prospective study. *CMAJ : Canadian Medical Association journal = journal de l'Association medicale canadienne*. 2002;166(6):749-54. Epub 2002/04/12.
110. Marhold C, Linton SJ, Melin L. Identification of obstacles for chronic pain patients to return to work: evaluation of a questionnaire. *Journal of occupational rehabilitation*. 2002;12(2):65-75. Epub 2002/05/17.
111. Ockander MK, Timpka T. Women's experiences of long term sickness absence: implications for rehabilitation practice and theory. *Scandinavian journal of public health*. 2003;31(2):143-8. Epub 2003/05/15.
112. Jensen IB, Busch H, Bodin L, Hagberg J, Nygren A, Bergstrom G. Cost effectiveness of two rehabilitation programmes for neck and back pain patients: A seven year follow-up. *Pain*. 2009;142(3):202-8. Epub 2009/02/17.
113. Brouwer S, Reneman MF, Bultmann U, van der Klink JJ, Groothoff JW. A prospective study of return to work across health conditions: perceived work attitude, self-efficacy and perceived social support. *Journal of occupational rehabilitation*. 2010;20(1):104-12. Epub 2009/11/07.
114. Sampere M, Gimeno D, Serra C, Plana M, Lopez JC, Martinez JM, et al. Return to work expectations of workers on long-term non-work-related sick leave. *Journal of occupational rehabilitation*. 2012;22(1):15-26. Epub 2011/06/28.
115. Mondloch MV, Cole DC, Frank JW. Does how you do depend on how you think you'll do? A systematic review of the evidence for a relation between patients' recovery expectations and health outcomes. *CMAJ : Canadian Medical Association journal = journal de l'Association medicale canadienne*. 2001;165(2):174-9. Epub 2001/08/15.
116. Lydell M, Grahn B, Mansson J, Baigi A, Marklund B. Predictive factors of sustained return to work for persons with musculoskeletal disorders who participated in rehabilitation. *Work*. 2009;33(3):317-28. Epub 2009/09/18.

117. Steenstra IA, Verbeek JH, Heymans MW, Bongers PM. Prognostic factors for duration of sick leave in patients sick listed with acute low back pain: a systematic review of the literature. *Occupational and environmental medicine*. 2005;62(12):851-60. Epub 2005/11/22.
118. Cornelius LR, van der Klink JJ, Groothoff JW, Brouwer S. Prognostic factors of long term disability due to mental disorders: a systematic review. *Journal of occupational rehabilitation*. 2011;21(2):259-74. Epub 2010/11/09.
119. Huijs JJ, Koppes LL, Taris TW, Blonk RW. Differences in Predictors of Return to Work Among Long-Term Sick-Listed Employees with Different Self-Reported Reasons for Sick Leave. *Journal of occupational rehabilitation*. 2012. Epub 2012/02/04.
120. Voss M, Josephson M, Stark S, Vaez M, Alexanderson K, Alfredsson L, et al. The influence of household work and of having children on sickness absence among publicly employed women in Sweden. *Scandinavian journal of public health*. 2008;36(6):564-72. Epub 2008/09/09.
121. McGeary DD, Mayer TG, Gatchel RJ. High pain ratings predict treatment failure in chronic occupational musculoskeletal disorders. *The Journal of bone and joint surgery American volume*. 2006;88(2):317-25. Epub 2006/02/03.
122. Hoedeman R, Blankenstein AH, Krol B, Koopmans PC, Groothoff JW. The contribution of high levels of somatic symptom severity to sickness absence duration, disability and discharge. *Journal of occupational rehabilitation*. 2010;20(2):264-73. Epub 2010/04/08.
123. Pompeii LA, Lipscomb HJ, Dement JM. Predictors of lost time from work among nursing personnel who sought treatment for back pain. *Work*. 2010;37(3):285-95. Epub 2010/10/28.
124. Shiri R, Kausto J, Martimo KP, Kaila-Kangas L, Takala EP, Viikari-Juntura E. Health-related effects of early part-time sick leave due to musculoskeletal disorders: a randomized controlled trial. *Scandinavian journal of work, environment & health*. 2012. Epub 2012/04/28.
125. Norrefalk JR, Littwold-Poljo A, Ryhle L, Jansen GB. Effect on work ability after team evaluation of functioning regarding pain, self-rated disability, and work ability assessment. *Journal of multidisciplinary healthcare*. 2010;3:155-9. Epub 2011/01/05.
126. Lethem J, Slade PD, Troup JD, Bentley G. Outline of a Fear-Avoidance Model of exaggerated pain perception--I. *Behaviour research and therapy*. 1983;21(4):401-8. Epub 1983/01/01.
127. Vlaeyen JW, Linton SJ. Fear-avoidance and its consequences in chronic musculoskeletal pain: a state of the art. *Pain*. 2000;85(3):317-32. Epub 2000/04/27.
128. Coutu MF, Baril R, Durand MJ, Cote D, Rouleau A, Cadieux G. Transforming the meaning of pain: an important step for the return to work. *Work*. 2010;35(2):209-19. Epub 2010/02/19.
129. Flink IK, Boersma K, MacDonald S, Linton SJ. Understanding catastrophizing from a misdirected problem-solving perspective. *British journal of health psychology*. 2012;17(2):408-19. Epub 2011/11/24.
130. Yoshino A, Okamoto Y, Onoda K, Shishida K, Yoshimura S, Kunisato Y, et al. Sadness Enhances the Experience of Pain and Affects Pain-Evoked Cortical Activities: An MEG Study. *The journal of pain : official journal of the American Pain Society*. 2012. Epub 2012/04/21.
131. Lotters F, Burdorf A. Prognostic factors for duration of sickness absence due to musculoskeletal disorders. *The Clinical journal of pain*. 2006;22(2):212-21. Epub 2006/01/24.
132. Johansson G, Lundberg O, Lundberg I. Return to work and adjustment latitude among employees on long-term sickness absence. *Journal of occupational rehabilitation*. 2006;16(2):185-95. Epub 2006/05/20.

133. Carroll C, Rick J, Pilgrim H, Cameron J, Hillage J. Workplace involvement improves return to work rates among employees with back pain on long-term sick leave: a systematic review of the effectiveness and cost-effectiveness of interventions. *Disability and rehabilitation*. 2010;32(8):607-21. Epub 2010/03/09.
134. van Duijn M, Lotters F, Burdorf A. Influence of modified work on return to work for employees on sick leave due to musculoskeletal complaints. *Journal of rehabilitation medicine : official journal of the UEMS European Board of Physical and Rehabilitation Medicine*. 2005;37(3):172-9. Epub 2005/07/26.
135. Post M, Krol B, Groothoff JW. Self-rated health as a predictor of return to work among employees on long-term sickness absence. *Disability and rehabilitation*. 2006;28(5):289-97. Epub 2006/02/24.
136. Strunin L, Boden LI. Paths of reentry: employment experiences of injured workers. *American journal of industrial medicine*. 2000;38(4):373-84. Epub 2000/09/13.
137. Bjarnason-Wehrens B, Grande G, Loewel H, Voller H, Mittag O. Gender-specific issues in cardiac rehabilitation: do women with ischaemic heart disease need specially tailored programmes? *European journal of cardiovascular prevention and rehabilitation : official journal of the European Society of Cardiology, Working Groups on Epidemiology & Prevention and Cardiac Rehabilitation and Exercise Physiology*. 2007;14(2):163-71. Epub 2007/04/21.
138. Katz JN, Wright EA, Guadagnoli E, Liang MH, Karlson EW, Cleary PD. Differences between men and women undergoing major orthopedic surgery for degenerative arthritis. *Arthritis and rheumatism*. 1994;37(5):687-94. Epub 1994/05/01.
139. de Lange AH, Taris TW, Kompier MA, Houtman IL, Bongers PM. "The very best of the millennium": longitudinal research and the demand-control-(support) model. *Journal of occupational health psychology*. 2003;8(4):282-305. Epub 2003/10/23.
140. Fukuoka Y, Dracup K, Takeshima M, Ishii N, Makaya M, Groah L, et al. Effect of job strain and depressive symptoms upon returning to work after acute coronary syndrome. *Soc Sci Med*. 2009;68(10):1875-81. Epub 2009/03/21.
141. Lidwall U, Bergendorff S, Voss M, Marklund S. Long-term sickness absence: changes in risk factors and the population at risk. *International journal of occupational medicine and environmental health*. 2009;22(2):157-68. Epub 2009/07/21.
142. Vingard E, Lindberg P, Josephson M, Voss M, Heijbel B, Alfredsson L, et al. Long-term sick-listing among women in the public sector and its associations with age, social situation, lifestyle, and work factors: a three-year follow-up study. *Scandinavian journal of public health*. 2005;33(5):370-5. Epub 2005/11/04.
143. Josephson M, Lindberg P, Voss M, Alfredsson L, Vingard E. The same factors influence job turnover and long spells of sick leave--a 3-year follow-up of Swedish nurses. *European journal of public health*. 2008;18(4):380-5. Epub 2008/02/23.
144. SOU. Rehabilitering till arbete, en reform med individen i centrum. Slutbtänkande av utredningen om den arbetslivsinriktade rehabiliteringen. (Ins Swedish) (Rehabilitation for work, a reform centering on the individual.). Stockholm: Socialdepartementet, 2000.
145. Goldenhar LM, Schulte PA. Intervention research in occupational health and safety. *Journal of occupational medicine : official publication of the Industrial Medical Association*. 1994;36(7):763-75. Epub 1994/07/01.
146. Kristensen TS. Intervention studies in occupational epidemiology. *Occupational and environmental medicine*. 2005;62(3):205-10. Epub 2005/02/23.
147. Barrie J. Patient empowerment and choice in chronic pain management. *Nurs Stand*. 2011;25(31):38-41. Epub 2011/05/13.
148. Viikari-Juntura E, Kausto J, Shiri R, Kaila-Kangas L, Takala EP, Karppinen J, et al. Return to work after early part-time sick leave due to musculoskeletal disorders: a

- randomized controlled trial. *Scandinavian journal of work, environment & health*. 2011. Epub 2011/10/29.
149. Karrholm J, Ekholm K, Jakobsson B, Ekholm J, Bergroth A, Schuldt K. Effects on work resumption of a co-operation project in vocational rehabilitation. Systematic, multi-professional, client-centred and solution-oriented co-operation. *Disability and rehabilitation*. 2006;28(7):457-67. Epub 2006/03/02.
150. Selander J, Marnetoft SU, Bergroth A, Ekholm J. The process of vocational rehabilitation for employed and unemployed people on sick-leave: employed people vs unemployed people in Stockholm compared with circumstances in rural Jamtland, Sweden. *Scandinavian journal of rehabilitation medicine*. 1998;30(1):55-60. Epub 1998/04/04.
151. Holmgren K, Dahlin Ivanoff S. Supervisors' views on employer responsibility in the return to work process. A focus group study. *Journal of occupational rehabilitation*. 2007;17(1):93-106. Epub 2006/07/04.
152. Janssen N, van den Heuvel WP, Beurskens AJ, Nijhuis FJ, Schroer CA, van Eijk JT. The Demand-Control-Support model as a predictor of return to work. *International journal of rehabilitation research Internationale Zeitschrift fur Rehabilitationsforschung Revue internationale de recherches de readaptation*. 2003;26(1):1-9. Epub 2003/02/26.