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# Healthcare and patient factors affecting sick leave

*From a primary health care perspective*

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### **Abstract**

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*Background:* For indeterminate reasons, there have been major variations in sick leave in Sweden, and many physicians have perceived sick leave assignments as burdensome.

*Aim:* To gain more knowledge and understanding, from a perspective of primary health care, about factors in health care and patients that affect sick leave. Thereby help patients in the best way, facilitate the work of physicians and other health professionals involved in the rehabilitation process, and use the health care resources optimally.

*Methods:* This thesis is based on a randomised controlled trial (RCT) in a primary health care centre with participants on short-term sick leave, due to pain and/or mental illness, who received a multidisciplinary assessment. Qualitative focus-group discussions with physicians in primary health care centres. A cohort of women on very long-term sick leave due to pain and/or mental illness, who lost sickness benefits due to a new time limit on sickness insurance, were randomised to multidisciplinary assessment and multimodal intervention (TEAM), or to Acceptance and Commitment Therapy (ACT). In an extended cohort, including some men on very long-term sick leave due to pain and/or mental illness, the importance of the motivation for return to work (RTW) was investigated.

*Results.* Very early multidisciplinary assessment increased days on sick leave in the first three month period. Physicians at primary health care centres perceived sick leave assignments as burdensome, but clearer rules and cooperation with other professionals have made sick leave assignments less burdensome. TEAM intervention resulted in an increase in working hours per week as well as an increase in work-related engagements, compared to control in the RCT. Motivation for RTW was associated with RTW or increased employability in the rehabilitation of patients

*Conclusions:* Continued studies are needed to find those who are at risk of long-term sick leave, the time when rehabilitation efforts should be started, and the content of rehabilitation. Collaboration in teams facilitates sick leave assignments for physicians at primary care health centres. Motivation for RTW might be a factor of importance for the effect of rehabilitation and needs to be studied further.

*Keywords:* Sick leave, rehabilitation, return to work, primary health care, randomised controlled trial, focus-group discussions, motivation

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*To my family*



# List of Papers

This thesis is based on the following papers, which are referred to in the text by their Roman numerals.

I. Carlsson, L, Englund L, Hallqvist J, Wallman T. (2013) Early multidisciplinary assessment was associated with longer periods of sick leave - a randomized controlled trial in a primary health care centre, *Scandinavian Journal of Primary Health Care*; 31: 141–146.

II. Carlsson L, Lännerström L, Wallman T, Holmström I. K. (2015) General practitioners' perceptions of working with the certification of sickness absences following changes in the Swedish social security system: a qualitative focus-group study, *BMC Family Practice*; 16:21.

III. Lytsy P, Carlsson L, Anderzén I. (2017) Effectiveness of two vocational rehabilitation programmes in women with long-term sick leave due to pain syndrome or mental illness: 1-year follow-up of a randomized controlled trial, *Journal of Rehabilitation medicine*; 49:170-177.

IV. Carlsson L, Lytsy P, Anderzén I, Hallqvist J, Wallman T., Gustavsson C. (2017) Motivation for return to work and actual return to work among people on long-term sick leave due to pain or mental health conditions. In manuscript.

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# Preface

Sick leave - a term that has often been discussed in medical clinics, in public debate and among patients in the last 15-20 years in Sweden. My interest in sick leave started 10 years ago when I looked out statistics for a meeting that showed that the total number of days of sick leave, at the primary health care centre where I worked, had reduced from nearly 85000 days in 2002 to 17000 days in 2008. However, this was not unique; in the national sick leave statistics, the trend was comparable.

Also physicians often experienced sick leave assignments as burdensome and patients sometimes suffered during sick leave processes. With the aim of gaining more knowledge about the factors that influence sick leave, and thereby providing better care for patients, making sick leave assignments less burdensome for physicians and using health care resources in the best way, I started the work on my thesis.



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# Introduction

## Sickness insurance in Sweden

The National Sickness Insurance Act, with income-based sickness benefit, was introduced in Sweden on 1 January 1955 with the purpose of providing compensation for loss of income due to illness. The insurance was national and mandatory. Prior to that, recognised sickness benefit societies were based on voluntary membership and generally paid a low level of compensation for sickness and incapacity to work.

All people over 16 years of age in Sweden with an income from work or unemployed, are today covered by health insurance. Sickness benefits are granted if work ability is reduced by at least 25% due to illness. Since 1992, the first 14 day's compensation is paid by the employer, except for the first day on which no compensation is paid. Thereafter the Swedish Social Insurance Agency (SSIA) pay compensation. Sick leave can be 25%, 50%, 75% or 100% of the working time. If one is sick more than a week, a medical certificate from a physician is required. Decisions to grant sickness benefit are taken by the Social Insurance Agency and are based on the medical certificate and information from the patient. Sick leave can be replaced by a disability pension if work ability is permanently reduced by at least 25%. Sick leave compensation is initially 80% of the salary for low and medium incomes but decreases to 75% after one year. On higher incomes, where sickness allowance reaches the maximum level of Swedish health insurance, compensation may be increased to nearly 80% by agreement and private insurance.

## Changes in Swedish sickness insurance

Sickness rates have fluctuated through the years in Sweden. There was a peak in sickness rates in 2003 which thereafter decreased until rates started to increase again in 2010. After the peak in 2003 Swedish authorities introduced several initiatives to improve the rehabilitation of people on sick-leave due to illness. Some are economic incentives for the county councils, while others are changes in regulations and rules.

The government has been spending up to SEK 1 billion each year from 2006 to 2016, to provide Sweden's 21 county councils with financial incentives to continue to enhance the quality and efficiency of the sickness certification process (Sjukskrivningsmiljarden) (1).

In 2007, as an aid to physicians, "Guidelines for Sick Leave" (Försäkringsmedicinskt beslutsstöd) was introduced, by the Swedish National Board of Health and Welfare. The purpose was to make certification of sickness consistent and coherent, and to achieve a legally secure certification-of-sickness process (2). "Guidelines for Sick Leave" offered recommendations regarding reasonable time for sick leave on specific diagnoses.

A modification to the 2008 legislation dictates that work ability should be assessed in relation to the patient's regular work tasks within the first 90 days of sick leave. For day 91–180, work ability is evaluated in respect to other work tasks at the patient's place of work. From Day 181, work ability is evaluated in respect to other normally occurring jobs within the entire labour market (Rehabiliteringskedjan) (3).

In 2008, a limit on the maximum sick leave time during which sickness benefits could be obtained, was also introduced. Sickness benefits were limited to 364 days within a 450-day period. Under certain conditions, the maximum time could be extended for an additional 550 days. Thereafter followed a three month evaluation period by the Swedish Public Employment Service (SPES). The political aim of the time limit and the re-examination programme was to reduce the use of health insurance in favour of employment insurance, with the further aim of achieving competitive employment (3). People with persisting health problems, after the three month re-examination programme, could return to sickness insurance if a physician certified continued work inability due to medical diagnosis.

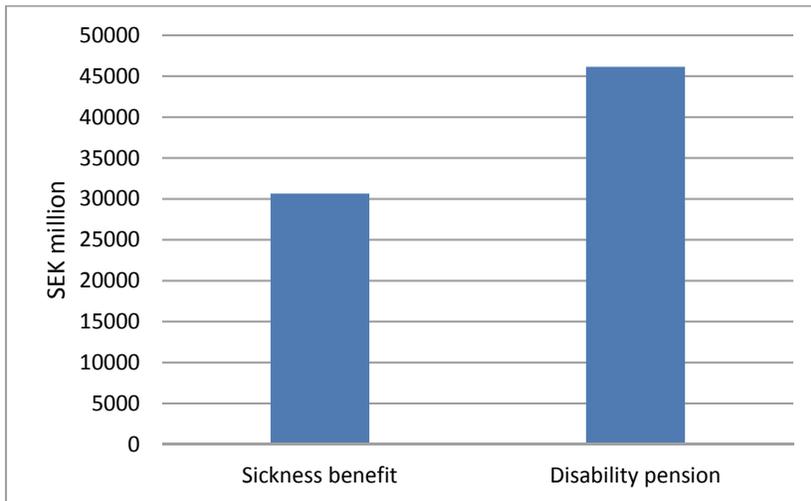
Since the turn of the year 2009/10 until 2015, it is estimated that in 100 000 cases sickness insurance compensation was terminated because of the time limit. The proportion who returned (within 15 months) was around 75 percent in 2013-2014 (4). The time limit on sickness insurance was abolished on 1 February 2016.

Another incentive is the "Rehabilitation Guarantee" (Rehabiliteringsgarantin), whereby the authorities paid the county councils SEK 1 billion each year from 2009 to 2015. This is a programme providing cognitive behavioural therapy to people with light or moderate mental disorders, and multimodal rehabilitation for those with musculoskeletal-related disorders in the back, neck and shoulders. The programme was introduced, with the aim of preventing sickness absence and increasing the rate of return to work (5).

The Swedish Social Insurance Agency has, in recent years, also become stricter in its assessment of the sickness certificate. To be accepted, the sickness certificate must be fully completed in accordance with the "DFA Chain" (DFA-kedjan), meaning that diagnosis, functional impairment and activity

limitation should be logically linked for the sickness absenteeism to be approved by the Swedish Social Insurance Agency (SSIA) (6).

A total of SEK 125.778 million was invested in financial security in the event of illness or disability in Sweden in 2014. Of this amount 30.636 was invested in sickness benefit and 46.139 in disability pensions. (figure 1) Another major expenditure was attendance allowance of SEK 28.589 million (7). The total amount for health care and medicine in Sweden in 2014 was SEK 249.918 million (8).



*Figure 1.* Expenditures in sickness benefit and disability pensions in Sweden in 2014.

All papers in this thesis were conducted during a period when the periodically high absence due to sickness was being questioned and the health care treatment and handling of health insurance was largely influenced by administrative decisions.

## Sick leave trends

Sick leave trends look very different in different countries. Some countries have high sickness rates, others low. In some countries, sick leave rates vary greatly and in other countries are constant at a lower level. (figure 2 and 3)

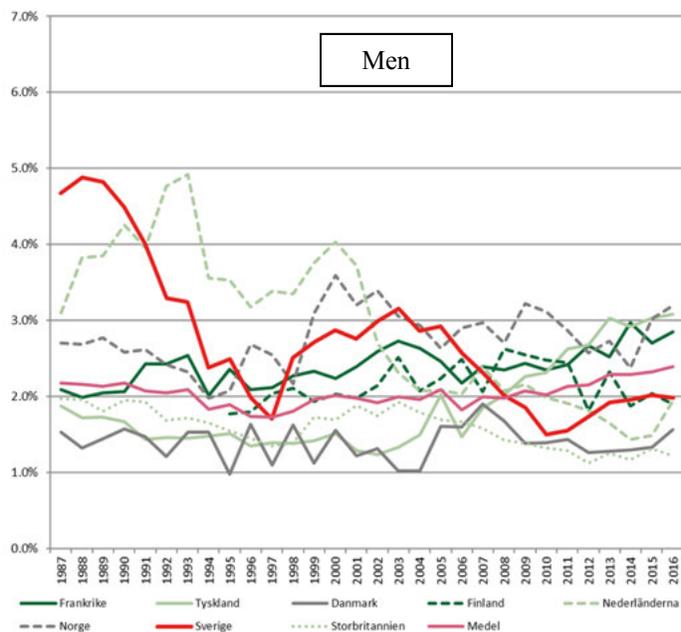


Figure 2. Sickness absence in men in eight European countries 1987-2016. Data from the Swedish Social Insurance Agency/Eurostat.

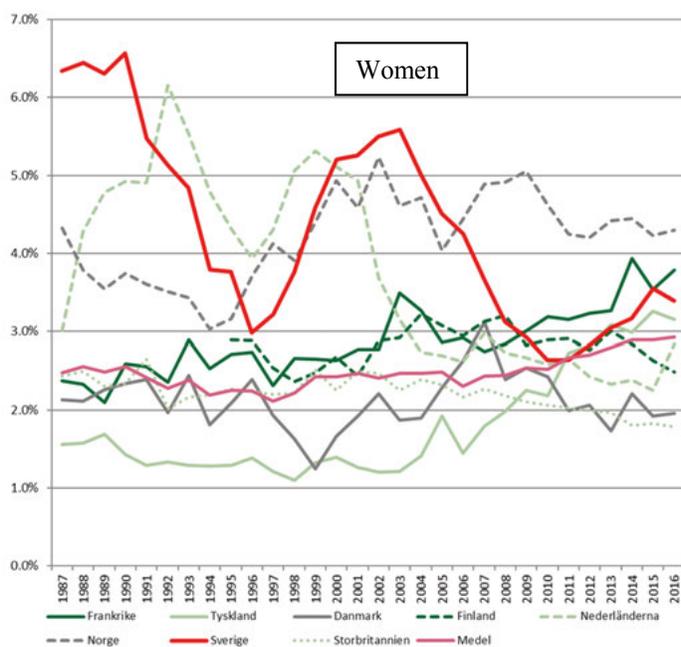


Figure 3. Sickness absence in women in eight European countries 1987-2016. Data from the Swedish Social Insurance Agency/Eurostat.

In Sweden, there has been intense debate on the issue of absence due to sickness over the past decade, because of the rapid and large increase in the number of sickness absence days. From 1998 to 2003, the total number of sickness absence days more than doubled. Thereafter, the number of days was reduced to a level even lower than in 1998, then the numbers started to rise again in 2010 (7, 9). (figure 4)

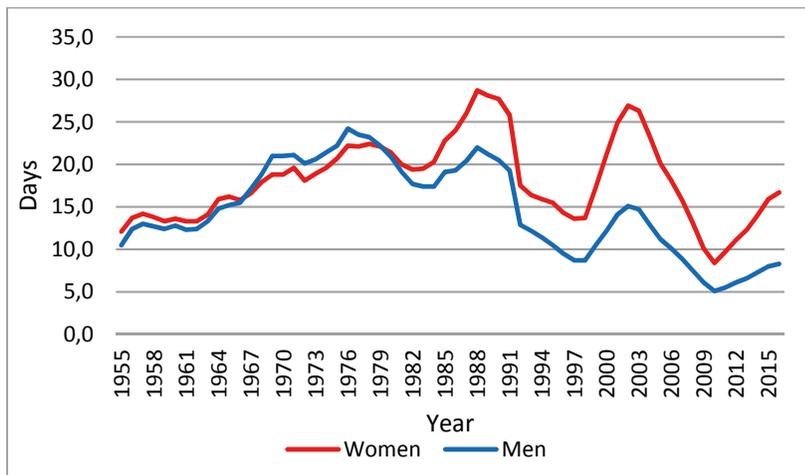
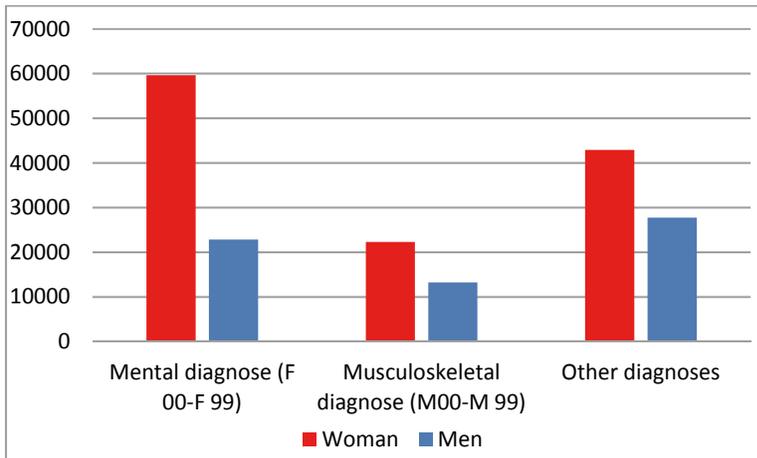


Figure 4. Gross sickness benefit days compensated for per insured person 1955-2016. Data from the Swedish Social Insurance Agency.

Compared to the changes in sickness rates that have occurred in Sweden and some other countries in Europe over the years, the effect of vocational rehabilitation on return to work (RTW) has been small (10-17).

Of the total days of absence due to sickness, approximately 20% were sick leave days and 80% were disability pension days in 2010 (18). No increased general morbidity, which could explain the increase in sick leave and disability benefit, has been demonstrated in studies of public health (19, 20). During the same period, 1998-2003 life expectancy increased to a minor extent for both men and women (19, 21).

Mental health disorders and musculoskeletal pain are the dominant causes of sickness absence in Sweden (14). (figure 5)



*Figure 5.* Number of ongoing cases of sickness benefit by 30-09-2016 in Sweden distributed by chapter of diagnosis and gender. Data from the Swedish Social Insurance Agency.

Women have been on sick leave more often than men in Sweden since the beginning of 1980 (22). The proportion of women who were in the labour market increased in the 1970s after several family reforms (parental insurance, expanded childcare, the right to retain work after parental leave, abolished joint taxation), and became comparable to men. Absence due to illness in both men and women is comparable until the birth of the first child, but then the sickness absence of women increases (23).

People on long-term sick leave and disability pensioners report decreased quality of life and show increased mortality in several studies (24-32).

In Sweden, the dominant causes of sick leave in 2015 were pain and mental illness. In December 2015 ongoing sick leave cases were, among women, mental illness 50% and musculoskeletal diagnoses 21%, and among men, mental illness 37% and musculoskeletal diagnoses 26% (33).

Most people who suffer from musculoskeletal pain in the general population are not on sick leave. In a study from the Swedish county of Dalarna of people who were not on sick leave, 49% of the men and 59% of the women reported “frequent pain in arm, back or legs” (34). Other studies report even higher occurrence of pain now and then and prevalence of up to 30% (35-37).

An analysis that attempted to explain the variation in sickness rates in Sweden showed mainly non-medical reasons, such as changes in laws and regulations regarding sick leave and disability pension and the application of these, changes in the labour force, and the administrative capacity of authorities (20).

Several studies have indicated that sick leave issues can be experienced as problematic, and even as a work environment problem for physicians in Sweden and other European countries (38-41).

Many studies have been conducted to improve the rehabilitation of people on sick leave. The effect on symptom levels are sometimes good but it has been more difficult to get a good effect regarding return to work (RTW). In an evaluation of the rehabilitation guarantee, whereby the authorities paid the county councils SEK 1 billion each year from 2009 to 2015 for cognitive behavioural therapy and multimodal rehabilitation, increased sick leave was reported (13). In a systematic literature review of interventions aimed at facilitating RTW, 9 of 23 (39%) of the interventions did not affect RTW (42).

## Research in insurance medicine and sick leave

Research into medical insurance and sick leave has, in comparison with other fields of research within medicine, a short history. The research field has grown fast in the last 15-20 years but still many questions need to be answered. The research area involves various disciplines such as medicine, psychology, social security, labour market and economy. Study of sick leave is complex, the health insurance system and the labour market is specific to different countries. There are also changes in both the legal framework in health insurance and the labour market over time. That makes comparisons of studies carried out in different countries or in different periods of time, difficult. In the studies are also interventions of various designs, which makes comparisons problematic. An important outcome measure "Return to work" can also be defined in many different ways (43, 44).

In addition to disease and illness, flow in and out of sickness insurance is affected by many factors that make research more complicated, for example; social insurance and laws and regulations, labour market, work environment, unemployment. Plus policy, attitude, cooperation and expertise in health care and social insurance, and control of social insurance. (20) Family factors as well as individual factors, such as lifestyle, skill, profession, personality, age and gender also play a part (45-51).

Light to moderate mental illness and musculoskeletal pain are the predominant causes of sick leave. In many countries, these patients are usually handled in primary health care, as they are in Sweden. Many of the studies on this group of patients have been done at specialist clinics. The patients differ between primary health care and specialist care. Plausibly more complex and severe pain is dealt with in specialist care. There may be a selection of patients coming to specialist clinics for participation in an intervention trial. It may therefore be difficult to implement the effect of the study in a specialist clinic in routine care at a primary health care centre.

There are five main areas of research on sick leave, according to SBU (the Swedish Council on Health Technology Assessment) (51).

1. *Risk factors for sick leave.*
2. *Consequences of being on sick leave.*
3. *What is preventing / promoting return to work.*
4. *Sick leave practice.*
5. *Method and theory studies.*

*Risk factors for sick leave;* A large number of factors have been associated with increased risk of sick leave, long-term sickness absenteeism and disability pension, apart from diagnosis. Some are sociodemographic; high age, gender, unemployment, low income, work environment (45-47, 50, 52-54), low job satisfaction, effort-reward imbalance, previous sick leave and sick leave duration. Others are individual factors such as depression, anxiety, degree and extent of pain, functional status, recovery expectations, internal locus of control, fear avoidance, catastrophising, self-perceived poor health, self-efficacy and own prediction of return to work (45-50). Even problems in childhood and adolescence have been identified as predictors of sick leave and disability pension in young adulthood (55). Many of the known risk factors for sick leave are the same for diverse diseases, such as mental illness and cardiovascular diseases (56, 57).

*Consequences of being on sick leave;* Sick leave and disability pension have been associated with decreased quality of life and increased mortality (24-31). Also sickness presenteeism has been identified as an independent risk factor for future poor general health (58).

*What is preventing / promoting return to work;* Multimodal rehabilitation is usually recommended. But the effect on RTW is sometimes doubtful (13, 17, 42). More focus on vocational rehabilitation might improve the effect on RTW (46-48, 59). Among sick-listed individuals with common mental disorders, no health measures were associated with RTW (60).

Knowledge of the effect of the very early and very late interventions for RTW is limited. Paper I focuses on the effect of a very early intervention and paper III studies the effect of interventions after very long-term sickness absence.

There are also limited studies and knowledge on the importance of motivation for RTW, paper IV examines this question.

*Sick leave practice;* Sick leave assignment is perceived by many physicians as burdensome and sometimes as a work environment problem (38-41, 61-69).

Paper II describes how GPs in Sweden perceive their work with certification of sickness absence following the changes in the sickness certification process 2006-2010.

*Method and theory studies;* Considerable work remains concerning theories, methods and concepts, in insurance medicine and rehabilitation for the development of the research field.

Theories about sick leave are grounded on several different perspectives. A fairly strict medical perspective and explanatory model governs formal sick leave in Sweden. To issue a medical certificate in Sweden, a diagnosis (55) is required supporting a reduction in work ability. The medical certificate must be completed in accordance with the “DFA Chain” (DFA-kedjan), where diagnosis, functional impairment and activity limitation should be logically linked for the sickness absenteeism to be approved by the Swedish Social Insurance Agency (6). The DFA chain can be considered as a simplification of Classification of Functioning, Disability and Health (ICF) (70, 71) where the importance of contextual factors is less. In clinical practice in primary health care, a wider bio-psycho-social perspective is the basis for sick leave and rehabilitation practice.

The structure of ICF:

*Functioning and Disability:*

- Body Functions and Body Structures
- Activities and Participation

*Contextual Factors:*

- Environmental Factors
- Personal Factors.

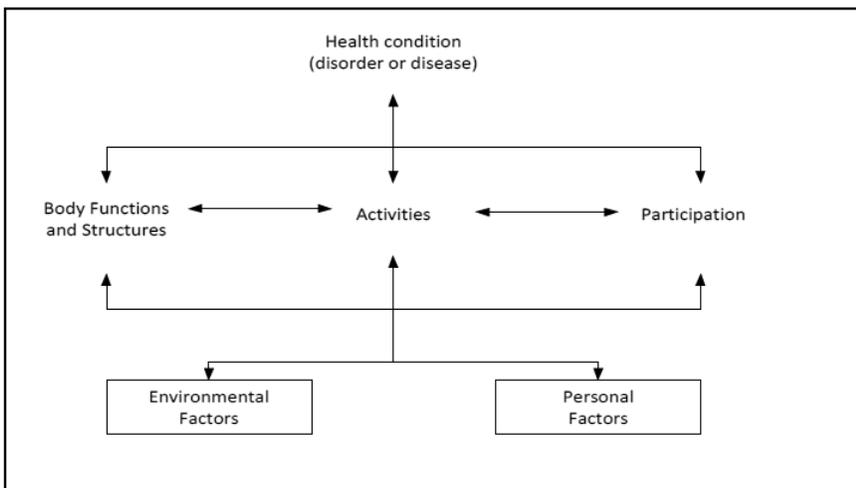


Figure 6. The ICF Model: Interaction between ICF components (WHO 2001).

In ICF the functioning of an individual in a specific domain reflects an interaction between the health condition and the contextual: environmental and personal factors. (figure 6)

Theories based on organisational psychological research use concepts such as “withdrawal behaviours” and “push factors” which means low job satisfaction explain sickness absence (72). Other theories include more factors such as work situation, personal characteristics and social environment, and regard attendance at work as a function of motivation for presence and ability to attend (73).

In sociological research, there are theories of absence culture where norms in a workplace on reasonable sick leave affect sickness absence (74).

Economic theories about sickness absence are based on the belief that man is a rational actor who tries to maximise his welfare, consisting of consumption and leisure (75).

Stress theories that focus on long-term stress have been prominent in sick leave research. Karasek's job-strain demand-control 'highlights factors (too much work and possibility to control work) important for employees' physical and mental health (76). Another stress theory highlights the importance of imbalance between "Effort-Reward". A big effort at work should give a corresponding reward (52, 77).

There are also models that include several parts of the above explanation models to explain sick leave (78, 79).

## Motivation

Different theoretical models have been developed to describe and understand motivation. Is motivation internal to the individual or a result of external factors? What is the relative effectiveness of Extrinsic Motivation versus Intrinsic Motivation? What is the relative influence of the Cognitive nature of motivation versus the Affective nature of motivation? (80). Incentive theories with intrinsic and extrinsic motivation, content theories like Maslow's hierarchy of needs (81) and Herzberg's two-factor theory (82), and cognitive theories like Goal-setting theory, are some examples of theoretical models to explain and describe motivation.

The term motivation is frequently used in clinical practice in regard to rehabilitation of people on sick leave, as a means to explain whether the person has an innate desire to return to work (RTW). The importance of motivation has been sparsely investigated within the research field of medicine, but there are studies indicating that RTW expectation, likewise motivation to RTW, predict work ability in chronic musculoskeletal and mental health conditions. (83-88). Effective methods to influence motivation for RTW remain to be established (89).

The word motivation is a part of everyday speech as well as a concept used in vocational rehabilitation. Motivation is a theoretical construct used to explain behaviour. It represents the reasons for people's actions, desires, and needs. A common definition of motivation is “the force that Energises, Directs, and Sustains behaviour” (80). Different overviews describe more than 20 different theories and models of motivation plus subgroups (80, 90).

The *Self-determination theory* (SDT) has been developed during the last decades and has empirical support in work motivation research, as well as in other research fields such as healthcare and education (91, 92).

SDT is a theory of human motivation and personality, concerning people's inherent growth tendencies and their innate psychological needs, developed during the 80's and 90's by Ryan and Deci (93). Human beings can be proactive and engaged or alternatively passive and alienated, largely as a function of the social conditions in which they develop and function. Accordingly, research guided by SDT has focused on the social-contextual conditions that facilitate versus prevent the natural processes of self-motivation and healthy psychological development (94). Specifically, factors have been examined that enhance versus undermine intrinsic motivation, self-regulation, and well-being. The findings have led to the postulate of three innate psychological needs: *competence*, *autonomy*, and *relatedness*, which when satisfied yield enhanced self-motivation and mental health and when thwarted lead to diminished motivation and well-being (94).

Intrinsic motivation concerns people carrying out an activity because they find it interesting and derive spontaneous satisfaction from the activity itself. Extrinsic motivation requires an instrumentality between the activity and some separable consequences such as tangible or verbal rewards, thus satisfaction does not come from the activity itself but rather from the extrinsic consequence to which the activity leads (91). SDT describes a continuum from amotivation, extrinsic motivation and intrinsic motivation. Extrinsic motivation in SDT is considered a continuum classified into four steps. *External Regulation* is closest to amotivation, where external demands and rewards control behaviour. *Introjected Regulation* means self-control, ego-involvement and internal rewards and punishment. *Identified Regulation* means personal importance and conscious valuing. *Integrated Regulation* means congruence, awareness and synthesis with self. Intrinsic motivation implies inherent interest in and enjoyment of the task (94). *Controlled motivation* refers to acting according to *External regulation* or *Introjected regulation*. *Autonomous motivation* refers to acting according to *Identified regulation*, *Integrated regulation* or Intrinsic motivation (91). (figure 7)

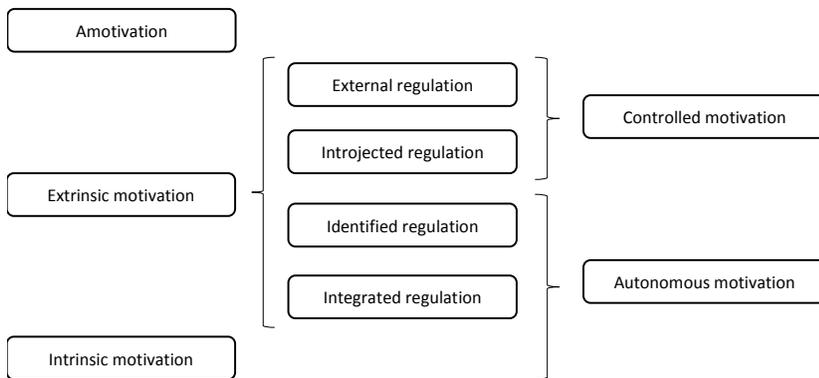


Figure 7. Figure of motivation theory according to the Self-determination theory.

*Controlled motivation* has been associated with negative consequences for workers, such as burnout. In contrast *Autonomous motivation* has been positively associated with psychological well-being (92). The primary difference between SDT and most other work motivation theories is that the focus of SDT is on the relative strength of autonomous versus controlled motivation, rather than on the total amount of motivation (91).

## Sick leave from my perspective

This thesis is based on a primary health care perspective on sick leave. The sick leave assignment is a common task at a primary health care centre (95). The sick leave assignment often has a significant impact on the patient and may be burdensome for the physician. General practitioners are the category of physicians in Sweden who experience sick leave as most burdensome (61, 62, 64-66, 68, 95, 96). Pain and mental illness are the dominating causes of sick leave in Sweden. Papers I, III and IV studied these patient groups. There are shortcomings in knowledge on when rehabilitation efforts are to be implemented in the course of sick leave and how the intervention is to be undertaken. In paper I, very early in the course of sick leave, the effect of multidisciplinary assessment was examined, and in paper III the effect of very late intervention with multidisciplinary treatment and ACT was investigated. There are limitations of knowledge on how physicians at primary health care centres experienced the changes that have occurred in the Swedish health insurance system. Paper II described how GPs in Sweden perceived their work with certification of sickness absence, following the changes in the sickness certification process 2006-2010. Motivation is a term commonly used in discussions about sick leave in clinics, but in medical research, studies on the importance of motivation are scarce. Paper IV examines the importance of motivation for RTW, for RTW, or increased employability of people with very long-term sick leave.

# Aims

The overall aim of this thesis was to gain more knowledge and understanding, from a perspective of primary health care, about factors in health care and patients that affect sick leave. Thereby help patients in the best way, facilitate the work of physicians and other health professionals involved in the rehabilitation process, and use the health care resources optimally.

## Specific aims

- To investigate the effect from an early multidisciplinary assessment on sick leave among people, on sick leave due to pain and/or mental illness, in a primary health care centre. (Paper I)
- To describe how physicians, in primary health care in Sweden, perceive their work with certification of sickness absence, following the changes in the sickness certification process 2006-2010. (Paper II)
- To investigate two different vocational rehabilitation interventions effects on RTW for women on very long-term sick leave due to pain and/or mental illness. (Paper III)
- To investigate the association between stated motivation for RTW, and actual RTW or increased employability, among people on very long-term sick leave due to pain and/or mental illness. (Paper IV)

# Study overview

Table 1. Overview of study question/aim, study designs, participants, sample sizes, data collection and results from the four papers included in the thesis.

	Paper I	Paper II	Paper III	Paper IV
Study question/aim	Does an early multidisciplinary assessment lower the risk for long-term sick leave?	How do GPs in Sweden perceive their work with certification of sickness absence following the changes in the sickness certification process 2006-2010?	Study the effect on return to work of two vocational rehabilitation programmes.	Study the association between motivation for RTW and RTW or increased employability after participating in a vocational rehabilitation programme.
Design	Randomised controlled trial	Qualitative focus-group	Randomised controlled trial	Cohort
Participants	Short-term sick leave (<28 days) due to pain and/or mental illness.	Physicians at primary health care centre.	Long-term sick leave women (average 7.5 years) due to pain and/or mental illness.	Long-term sick leave (average 7.9 years) due to pain and/or mental illness.
Sample size	36	22 (5 groups)	308	227
Collection of data	Electronic patient records and data from the Swedish Social Insurance Agency.	Verbatim transcribed recorded focus-group discussions.	Questionnaire and data from the Swedish Social Insurance Agency.	Questionnaire
Result	Early multidisciplinary assessment increased days on sick leave.	Physicians at primary health care centres perceive sick leave assignments as burdensome but clearer rules and cooperation with other professionals makes sick leave assignments less burdensome.	Also after very long periods of sick leave, rehabilitation with multidisciplinary rehabilitation team can have an impact on RTW.	Motivation for RTW was associated with RTW or increased employability.

GP= General practitioner, RTW=Return to work

# Methods

## Setting and participants

### Paper I

Patients eligible to participate in this study of early multidisciplinary assessment were on sick leave, either full-time or part-time, according to ICD 10-diagnoses chapter V F00-F99 (psychiatric diseases) or Chapter XIII M00-M99 (musculoskeletal diseases), and had ongoing sick-leave periods of a maximum of 28 days at randomisation (97). The inclusion process took place from spring 2007 until winter 2008/2009, at a primary health care centre in a small town in mid Sweden. Randomisation was done by the physician at the health care centre who wrote the sickness certificates by opening randomly mixed closed envelopes.

Patients randomised to intervention were given an appointment within a week to meet the assessors. The physiotherapist performed a clinical examination of the musculoskeletal system. The psychotherapist made an assessment of the psychosocial situation at work and at home. The occupational therapist performed an assessment of the patient's general working capacity. All three therapists used the methods and tools they normally use in their clinical work at the primary health care centre.

The intervention did not include any treatment, but if a patient was judged to have the potential to benefit from treatment, he or she was referred by the GP to standard healthcare resources. Controls received "treatment as usual" which did not include this kind of early assessment. All information from the assessments was documented in the electronic patient record and usually also discussed with the GP who had issued the medical certificate, within a week of the assessment.

Power calculation assumed that 30% of patients on sick leave after 14 days would still be on sick leave after three months. The aim of this study was to half the number of patients still on sick leave at three months. With a P-value of 0.05 and a desired power of 0.8, 64 subjects were needed. The recruitment of participants was stopped prematurely before the planned number could be included, due to new regulations introduced nationally (the Rehabilitation Guarantee) linked to financial compensation for the primary health care centre.

## Paper II

Focus group discussions, (FGDs), are an effective way to obtain as wide a spectrum as possible of views on a research question (98). FGDs are also particularly effective in capturing variation in the opinions of a group (99). In FGDs, people are encouraged to talk to one another, ask questions, exchange anecdotes and comment on each other's experiences and points of view (100). In an FGD, one can more easily discuss sensitive and taboo topics through group interaction (98). The goal of a FGD is not to reach consensus or find solutions, but rather, to highlight different views on an issue (98). According to Morgan, the FGD is suitable when there are considerable differences between people's perceptions and when you wish to understand the differences (101). Participants were selected strategically from different parts of Sweden using our professional network of General practitioners (GPs), with the goal of obtaining a wide variation. The informants were enrolled from rural areas and cities with different population sizes and with varying professional experience and gender. The goal was to achieve "maximum variation in sampling" (102).

A total of five focus group discussions comprising 22 GPs were conducted in late 2011 and 2012. The FGDs were semi-structured, with open questions. A discussion guide was constructed based on previous studies and clinical experience, to ensure that important areas were covered. The FGDs lasted 50-90 minutes. The majority of the GPs were public employees, but one FGD consisted of four private GPs. One group consisted of physicians in training to become specialists in family medicine; the rest of the groups consisted of specialists. The FGDs were conducted at the physicians' workplace. The informants in each FGD knew each other, as they worked at the same location. The FGDs were digitally recorded and transcribed verbatim.

## Paper III

Eligible for the study were all women in Uppsala County on full- or part-time sick leave who were about to reach the limit of maximum sick leave time to obtain sickness benefits, introduced in 2008, and consequently were forced to leave sickness insurance. They were identified by the Swedish Social Insurance Agency (SSIA) in Uppsala. In total 947 women were identified as reaching the time limit during the inclusion period June 2010 to June 2011.

The study population lost sickness benefit for three months and received reimbursement from the Swedish Public Employment Service (SPES), who evaluated work capacity in parallel with two interventions and the control group. The participants were randomised to multidisciplinary assessment and multimodal intervention (TEAM) or to Acceptance and Commitment Therapy (ACT) or control (103).

The TEAM intervention consisted of a physician, a psychologist, an occupational therapist and a social worker. The Interventions started 1-3 months ahead of the participants' loss of sickness benefits and transfer to SPES. Each member of the team met separately with the participant for 1.5-2 hours. The team members then met to discuss the participant's situation. The team agreed on an individualised rehabilitation plan with suggested interventions. The plan could include medical investigation/treatment, physiotherapy, evaluation and training by an occupational therapist and social and economic advice from a social worker. The plan was then presented to the participant. The participants had the choice of accepting the plan, accepting parts of it or not accepting the plan. The team met weekly to evaluate the situation for each participant.

The ACT group obtained a form of Cognitive Behavioural Therapy that uses acceptance and mindfulness strategies, together with behavioural strategies, to increase function and quality of life rather than decreasing symptoms. ACT has been shown to have an effect in musculoskeletal pain to improve functional status (104-106) and mental disorders such as depression (107), anxiety (108) and social phobia (109). Participants in the ACT group received treatment with ACT only. Participants in the TEAM group could receive ACT if considered appropriate.

All participants, including participants in the control group, received a structured collaboration with the local Social Insurance Agency and the local Employment office. The main objective was to increase the participant's commitment to playing an active part in the rehabilitation process.

No formal power-analysis was conducted. The project included participants over a one-year period, during which all eligible individuals were invited to participate.

## Paper IV

This study was based on data from participants in two intervention studies, Vitalis 1 (only women) and Vitalis 2 (women and some men) (110). All participants in the intervention studies were on full- or part-time sick leave and were about to lose their sickness benefits due to the new time limit on sickness insurance. In total 1,331 individuals were identified as eligible to participate in the two vocational rehabilitation interventions, Vitalis 1 (only women) or Vitalis 2 (women and men) (110), in the county of Uppsala by the Swedish Social Insurance Agency (SSIA), during the inclusion period, June 2010 to December 2012.

One to four months before losing sickness benefits and being transferred to the Swedish Public Employment Service (SPES), the participants answered a question about motivation for RTW

In parallel to SPES evaluation of work capacity, the participants were randomly allocated one of the three intervention treatments or the control group condition. The participants in Vitalis 1 were randomly allocated to

Multidisciplinary assessment and multimodal intervention (TEAM) or Acceptance and Commitment Therapy (ACT).

The intervention of Vitalis 2 was a mixture of ACT and TEAM interventions (110). Control group received no treatment other than the SPES evaluation

All participants were engaged in a structured collaboration with the local SSIA and the local SPES. Reimbursement after the three-month evaluation period at SPES was dependent on the evaluation and results of the interventions. Reimbursement could continue to come from SPES or return to the SSIA. Some received income of work or reimbursement from the Social Welfare Office (SWO).

No formal power-analysis was conducted. The project included participants over a two-and-a-half-year period, during which all eligible individuals were invited to participate.

## Data sources and variables

### Paper I

The data on extent (full time or part time) and duration (days) of the sick leave periods in the study, was gathered from the electronic patient records at the primary health care centre for the first 14 days, and from the records of the Social Insurance Agency for the subsequent periods. Both gross and net days of sick leave were analysed.

### Paper II

A total of five FGDs were conducted. The discussions were recorded with a digital voice recorder and were then transcribed verbatim. All FGDs were conducted in Swedish, and the analysis was also conducted in Swedish by the authors. After analysis, the quotes were translated into English by the authors and checked by a native English-speaking translator.

### Paper III

Four different outcome measures were used to assess the interventions' effects on RTW at 12 months, two using register data from the health insurance system and two using self-reported data on working hours and changes in work-related engagement.

- Returning to the health insurance at 12 months; dichotomous variable.
- Number of reimbursed health insurance days during follow-up time of 12 months.
- Self-reported change in working hours between base line and 12 months.

- Self-reported change in degree of engagement. This variable was based on the difference in working hours, work training hours, work rehabilitation activity hours and study participation, between base-line and 12-month follow-up.

## Paper IV

*The independent variable* “motivation” was measured at 1-4 months before sickness benefits ended, by questionnaires requiring level of agreement with the statement: “I am motivated to return to work” with response options: “Agree completely”, “Agree somewhat”, “Do neither agree nor disagree”, “Disagree partly”, and “Disagree completely”.

*The dependent variable* was categorised according to changes in the source of reimbursement, at baseline and after 12 months. The dependent variable was measured 12 months from baseline, with a questionnaire. The participants stated the source of the reimbursement and the percentage of their reimbursement at that time and at baseline. The reimbursement could come from the Social Welfare Office (SWO), the Swedish Social Insurance Agency (SSIA), the Swedish Public Employment Service (SPES) or income from work. The Return To Work or Social position Change (RTWSC) approach yielded four possible outcomes. “Increased work” implied starting to receive income from work or getting an increased percentage of wages, among those who were already wage-earners at baseline regardless of unemployment compensation or sickness benefits. Everyone in this category either lost or had reduced sickness benefits. “Increased employability” implied that they received unemployment compensation from SPES or an increased percentage of unemployment compensation replacing the reduced sickness benefits from SSIA, as compared to baseline, but they had no change in income from work. “Unchanged” implied no change in reimbursement at 12 months regarding sickness benefits from SSIA, unemployment compensation from SPES or wages from an employer compared with baseline conditions. “Decreased work and employability” implied decreased wages, decreased unemployment compensation or change in sickness benefits without compensation from SPES or wages. The data was analysed in multinomial regression models with four outcomes, with unchanged as the reference category. The RTWSC outcome was also dichotomised by merging “decreased work or employability” and “unchanged” and merging “increased employability” and “increased work”.

## Statistical methods/analysis

### Paper I

All patients who were included after randomisation and who did not actively decline to attend, were analysed (n=33).

As the material was relatively small and not normally distributed, the tests used were non-parametric (Mann-Whitney U test and Fisher's Exact Test). All analyses were calculated using two-sided tests. The statistical analyses were performed using SPSS statistics (IBM Corp, Armonk, New York), version 18.

### Paper II

Qualitative analysis was performed using conventional manifest content analysis (111, 112). In qualitative manifest content analysis, meaning units were classified in subcategories after coding. After continued abstraction and analysis of the subcategories, they were grouped into categories. After listening to the recorded interviews and checking the verbatim transcribed recordings, an initial identification of meaning units was done by the first author. Thereafter, this initial coding was scrutinised and revised by all authors, until consensus was reached.

### Paper III

The four outcomes were tested using regression modelling; logistic regressions for the dichotomous outcomes (1 and 4), and ordinal regressions for the ordinal outcomes (2 and 3). Assumptions of proportional odds were found valid for ordinal regressions. Results were presented as odds ratios (OR) with 95% confidence intervals. Intention-to-treat-analyses were performed for complete register based data (outcomes 1 and 2), and complete cases from responders were used for self-reported data. All tests were two sided and a level of  $p < 0.05$  was considered statistically significant. The statistical analyses were performed using SPSS statistics (IBM Corp, Armonk, New York), version 22.0.

### Paper IV

Associations between the main exposure (motivation) and the outcome (RTWSC) were investigated in logistic and multinomial regression models. A directed acyclic graph (DAG) was used to choose a subset of covariates to be included in the statistical analysis in order to minimise bias (113-116) (see DAG supplement). In accordance with our DAG suggestion, we chose to include age, employment, part-time work at baseline, sick leave duration, self-rated health, HADS depression, HADS anxiety, self-efficacy and pain in the

logistic and multinomial regression models to analyse the effect of motivation on RTW. The full DAG is available as a supplement. Results from regression analyses were presented as odds ratios (OR) with 95% confidence intervals. All tests were two-sided and a level of  $p < 0.05$  was considered statistically significant.

The impact of missing data from all included participants in the intervention studies ( $n=427$ ), as compared to the participants in this study having complete data on motivation at baseline and RTWSC ( $n=227$ ), was analysed by between-group differences in baseline characteristics. In the analyses t-tests for continuous data, Mann-Whitney U for ordinal data and for data not normally distributed, and chi-square tests for nominal data were used. In addition, sensitivity analysis was performed using “worst case” analyses, whereby all missing data among participants ( $n=427$ ) in the dichotomised outcome was set to either 0 (decreased work or employability and unchanged) or 1 (increased employability and increased work), in order to avoid favouring a false positive finding in the logistic regression analysis. The statistical analyses were performed using SPSS statistics (IBM Corp, Armonk, New York), version 21.0.

## Ethical considerations

Participants were given oral and written information about the studies and written informed consent was obtained from each participant. All data has been kept in a secure place with identification codes separate from the main database. In all of the four papers included in this thesis measures were taken when presenting data to avoid individual participants being identified. All studies had approval from the Regional Ethical Review Board at Uppsala University. Study I Dnr 2006/305, Study II Dnr 2011/466, Studies III and IV, Dnr 2010/088 and 201/088/1 respectively.

# Results

## Participants

### Paper I

Fifty eight patients were invited to take part in the study. Eight GPs recruited the patients. Thirty six patients agreed to participate in the study and were randomised, but three women (one in the control group and two in the intervention group) later withdrew from participation before assessment. Thirty three patients were finally committed to the study. (figure 8)

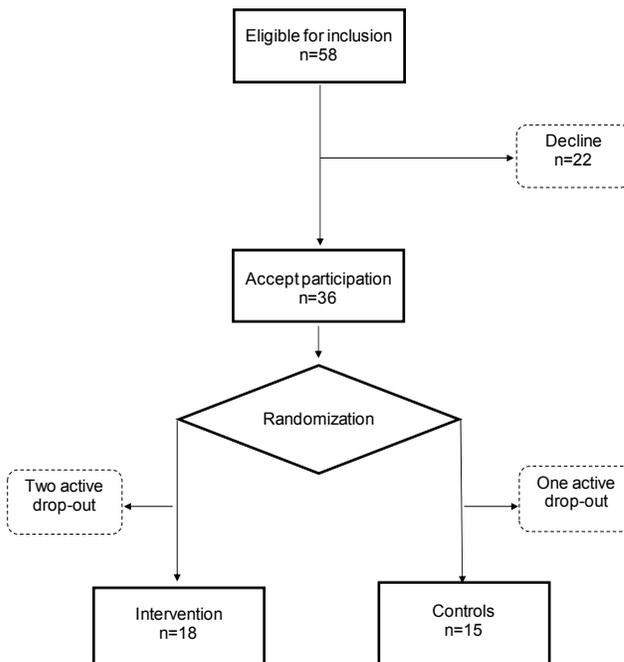


Figure 8. Flow chart of participants.

The randomisation resulted in groups that were similar regarding age, sex and diagnoses on the sickness certificate. (table 2)

Table 2. Study population age, sex, and sick-leave diagnosis

	n	Age	Female %	Pain diagnosis	Mental illness	Pain+Mental illness
Invited to participate	58	46	72	*	*	*
Declined participation	22	46	82	*	*	*
Randomised	36	46	67	27	6	3
Control group	15	48	67	11	3	1
Intervention (intention to treat)	18	44	61	13	3	2
Intervention (completed)	16	45	62	11	3	2

\*=not available

## Paper II

A total of five Focus group discussions (FGDs) comprising 22 General practitioners (GPs) were conducted. The focus groups had three to seven participants each, and a total of ten participants (45%) were women. The age of the participants varied between 30 and 63 years, with an average age of 45 years. The informants' experience of working as GPs ranged from 1 to 32 years, with an average tenure of 9 years. Twelve GPs worked full-time, and the others worked part-time.

Table 3. Participants in Focus group discussions.

Person	Specialist in family medicine	Working years as a physician	Extent of duty	Personal experience of sick leave more than 7 days	Specially engaged in sickness absence issues
1	Yes	28	70	Yes	0
2	Yes	7	100	0	0
3	0	1	100	0	0
4	Yes	28	100	Yes	Yes
5	Yes	12	80	Yes	0
6	Yes	1	100	0	0
7	0	-	75	0	0
8	Yes	16	100	0	Yes
9	Yes	16	100	0	0
10	Yes	18	100	0	0
11	Yes	7	65	0	0
12	Yes	32	85	0	0
13	Yes	1	100	0	0
14	Yes	4	100	0	Yes
15	Yes	6	75	0	0
16	0	6	80	Yes	0
17	0	2	100	0	0
18	0	2	80	0	0
19	0	2	100	0	0
20	0	2	100	Yes	0
21	0	1	80	0	0
22	0	1	75	Yes	0

### Paper III

All participants in the intervention study were about to lose their sickness benefits due to the new time limit on sickness insurance. In total 947 women were identified as eligible to participate in the county of Uppsala by the Swedish Social Insurance Agency (SSIA) during the inclusion period, June 2010 to June 2011.

People with clearly non-included diagnoses (n=114) were omitted by the Social Insurance Office administrators. The rest had their doctors' certificates screened by a physician and an occupational therapist or psychologist in order to determine fulfilment of the *inclusion criteria*, being: 1) on sick leave for a pain syndrome and/or a mental illness 2) aged between 20-64 years; as well as not fulfilling the *exclusion criteria*, which comprised: 1) being a high suicidal risk, 2) having ongoing alcohol/substance abuse, 3) having a major mental disorder (schizophrenia, bipolar disorder type I, severe social dysfunction/personality disorder), 4) being currently in psychotherapy or other structured vocational rehabilitation programme, according to information found in the doctors' certificates.

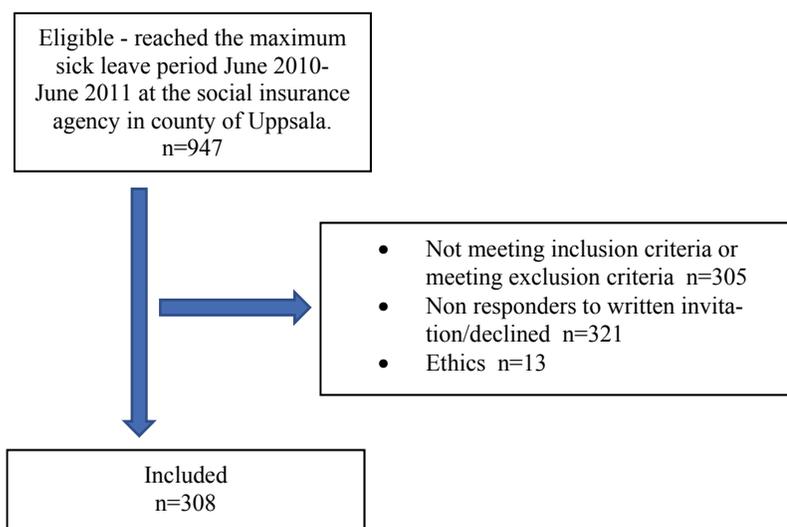


Figure 9. Flow-chart of inclusion and exclusion procedure

A further 191 women were excluded at the screening, mainly due to being on sick leave due to non-inclusive diagnoses. A total of 176 did not respond to the invitation to participate in the project and additionally 145 responded, but declined to participate. Thirteen people were excluded because they were contacted before the study was formally approved by the ethics committee. The remaining 308 women did finally participate in the study. (figure 9)

Table 4. Base-line study group characteristics.

	ACT n=102	TEAM n=102	Control n=104
Age, years (mean, SD)	47.8 (7.8)	49.9 (8.7)	47.8 (8.4)
Years on insurance benefits (SD)	7.6 (3.1)	7.5 (3.1)	7.5 (3.4)
Highest education (%)			
Primary school	14.7	23.3	21.1
Secondary school	44.0	45.2	43.4
University	41.3	31.5	35.5
Employment status (%)			
Employed	57.8	69.6	63.5
Unemployed	42.2	30.4	36.5
Type of reimbursement (%)			
Sick leave money	12.7	10.8	19.2
Sick reimbursement	87.3	89.2	80.8
Magnitude of reimbursement (%)			
25 %	14.7	11.9	12.6
50 %	22.5	32.7	30.1
75 %	8.8	7.9	4.9
100 %	53.9	47.5	52.4
Main diagnoses on sick certificate (%)			
Psychiatric	41.2	29.4	28.8
Pain	32.4	38.2	39.4
Both psychiatric and pain	26.5	32.4	31.7
Screening diagnoses using MINI <sup>a</sup> (%)			
Major depressive episode <sup>b</sup>	75.0	76.3	n.a.
Generalised anxiety <sup>b</sup>	14.7	13.2	n.a.
Panic disorder	36.0	25.0	n.a.
Social phobia	17.3	18.4	n.a.
Manic or hypomanic episode	11.8	4.1	n.a.
HADS			
HADS anxiety (mean, SD)	10.1 (4.9)	10.4 (4.9)	11.1(5.1)
HADS depression (mean, SD)	8.4 (4.2)	9.4 (4.8)	9.2 (5.1)
General Health Questionnaire (mean, SD)	18.9 (7.4)*	17.4 (7.9)	16.4 (7.1)
SWLS	16.5 (7.1)	15.2 (7.1)	14.5 (7.5)
Self-Efficacy Scale	24.0 (7.0)	23.1 (6.8)	22.2 (6.5)
Use of antidepressants (%)	41.0	43.8	42.4
Use of tranquillisers (%)	13.3	20.7	18.5
Use of sedatives (%)	30.1	32.6	37.0
Use of analgesics (%)	65.1	79.5	77.2
Alcohol risk use (AUDIT-C $\geq 3$ ) (%)	36.9	39.8	31.9
MADRS <sup>a</sup> (mean, SD)	16.0 (9.6)	19.4 (10.5)	n.a.

SD= standard deviation, MINI=The Mini-International Neuropsychiatric Interview, HADS=The Hospital Anxiety and Depression Scale; SWLS=The Satisfaction With Life Scale; AUDIT-C=The AUDIT alcohol consumption questions. MADRS=Montgomery Asberg Depression Rating Scale

The study population's average age was 48.5 years (SD 6.3) and their average sick leave time was 7.5 years (SD 3.2). About two-thirds of the study population were employed, and most participants (51.3%) had full sick reimbursement (100%) from the health insurance system when entering the study.

At base-line, about one third were on sick leave with a psychiatric diagnosis, about one third with pain diagnosis and about one third due to a combination of pain and psychiatric illness. (table 4)

## Paper IV

In total: 1331 individuals had been identified eligible for the studies in the county of Uppsala by the Uppsala office of the Swedish Social Insurance Agency (SSIA). Participants were about to lose their sickness benefits due to the new time limit on sickness insurance during the inclusion period June 2010 to December 2012. Altogether, 418 people were excluded because they did not meet the inclusion criteria, being: 1. On sick leave due to pain syndrome or mild to moderate mental health conditions. 2. Being aged between 20 and 64 years, or due to having one or more exclusion criteria: 1. Considered a high suicidal risk. 2. Having ongoing alcohol/substance abuse. 3. Being diagnosed with a major mental disorder (schizophrenia, bipolar disorder type I, severe social dysfunction/personality disorder. 4. Currently being in psychotherapy or other structured vocational rehabilitation programme. In total 473 people did not respond to a mailed invitation to participate. Thirteen people were excluded because they were contacted before the study was formally approved by the ethics committee. A total of 427 people; 401 women and 26 men, did participate in the two intervention studies Vitalis 1 and Vitalis 2. Of these individuals, 227 answered both the motivation question and questions about reimbursement and were the participants in paper IV. (figure 10)

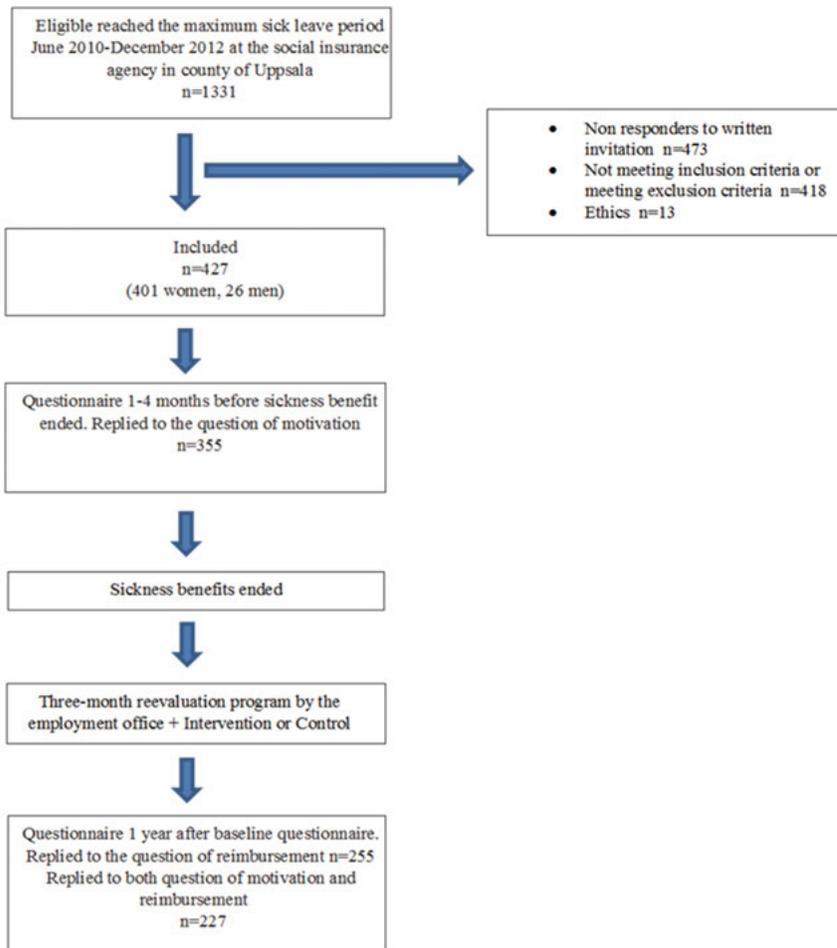


Figure 10. Flow charts of recruitment process of the study sample

The average age of the participants was 48.9 years (SD 8.3). The study group consisted of 94.7% women, and 5.3% men. Most participants (67.8%) had an employer, and the average sick leave time was 7.7 years (SD 3.2). Baseline characteristics of the participants are shown in table 1. The participants who were motivated to RTW had similar baseline characteristics compared to the less or not motivated participants. The motivated had, however, somewhat higher activity according to ÖMSPQ and less depression according to HADS. (table 5)

Table 5. Baseline characteristics of participants who responded to the question of motivation for RTW (n=227)

	Motivated (n=127) % (n)	Less or not motivated (n=100) % (n)
Age category		
20-34	6 (8)	4 (4)
35-59	88 (111)	84 (84)
60-65	6 (8)	12 (12)
Sex		
Female	95 (121)	92 (92)
Male	5 (6)	8 (8)
Diagnosis		
Mental disorder	29 (37)	30 (30)
Pain	45 (57)	39 (39)
Mental disorder+Pain	26 (33)	31 (31)
Employment		
Employed	68 (87)	67 (67)
Unemployed	32 (40)	33 (33)
Sick leave duration years		
Mean (SD) Min-max	7.8 (3.3) 1.7-16.9	8.0 (3.2) 2.4-13.8
Part-time work at baseline	41 (52)	38 (38)
Country of birth		
Sweden	80 (102)	84 (84)
Other than Sweden	20 (25)	15 (15)
Education		
Elementary school	15 (17)	17 (17)
High school	51 (57)	46 (46)
University	34 (38)	26 (26)
Intervention or control group		
Intervention	63 (80)	65 (65)
Control	37 (47)	35 (35)
	Median, (IQR) Min-max	Median, (IQR) Min-max
Activity according to ÖMSQP (0-50)	28 (15-39) 0-50	21 (12-32) 0-50
Self-rated health (1-5)	2 (2-3) 1-5	2 (2-3) 1-4
HADS depression subscale (0-21)	7 (4-11) 1-19	10 (8-13) 1-20
HADS anxiety subscale (0-21)	9 (6-13.5) 0-20	12 (8-15) 1-21
GSE Self-efficacy (10-40)	24.5 (20-30) 11-40	22 (17-26) 9-38
Pain during previous 3 month (0-10)	6 (5-7) 0-10	6 (5-7) 2-10

RTW=Return to work, SD=standard deviation, IQR= inter quartile range, ÖMPSQ=Örebro Musculoskeletal Pain Screening Questionnaire, HADS= The Hospital Anxiety and Depression Scale, GSE=General Self-efficacy scale.

# Main results

## Paper I

Early multidisciplinary assessment was found to significantly increase gross days on sick leave in the first three month period. The proportion of people on part-time sick leave was significantly higher in the intervention group, but sick leave was longer in this group, even when counted as net days. (table 6)

Table 6. Sick leave measures at three and twelve months for intervention and control group.

	Intervention (n=18)	Control (n=15)	
On sick leave after 3 months	7/18	3/15	p=0,283
Total number of sick days gross 0-3 months			
Mean (SD)	58 (32)	36 (33)	p=0,038*
Median	65	21	
Total number of sick days net 0-3 months			
Mean (SD)	48 (32)	32 (29)	p=0,070
Median	42	21	
Number of individuals who were on partial sick leave 0-3 months	10/18	2/15	p=0,027*
Sick leave after 12 months	4/18	1/15	p=0,346
Total number of sick leave days gross 3-12 months mean (SD)	91 (123)	58 (95)	p=0,727
Total number of sick leave days net 3-12 months mean (SD)	77 (109)	37 (62)	p=0,580

SD=standard deviation

## Paper II

A total of 349 meaning units were identified from the five Focus group discussions (FGDs). All meaning units were included in the analysis. Further abstraction and content analysis resulted in 23 subcategories that could be grouped into four categories.

The four categories that emerged from the analysis of the FGDs with General practitioners (GPs) in Sweden, discussing how they perceived certification of sickness absence (COSA) assignments, will be discussed in detail below. (table 7)

Table 7. Four categories emerged from the analysis of the FGDs with GPs.

- 
1. *Physicians' difficulties in their professional role*
  2. *Collaboration with other professionals facilitates the COSA*
  3. *Physicians' approach in relation to the patient*
  4. *An easier COSA process*

1. The physicians found it burdensome to have a dual role as the patient's physician and as an official issuing sickness certificates to the Social Insurance Agency. These dual roles were not only exhausting for the physicians, but were most likely also confusing for patients.

The assessment of the impact of the patient's symptoms on work ability was experienced as being difficult. The GPs at the health centres had very little knowledge about the patient's actual situation at the workplace, and had to rely entirely on the patient's description of working conditions.

The GPs experienced doubt concerning whether sickness absence always helped the patient. There was concern that it could be a way of escaping from workplace problems instead of solving them, thereby paradoxically slowing down clinical recovery.

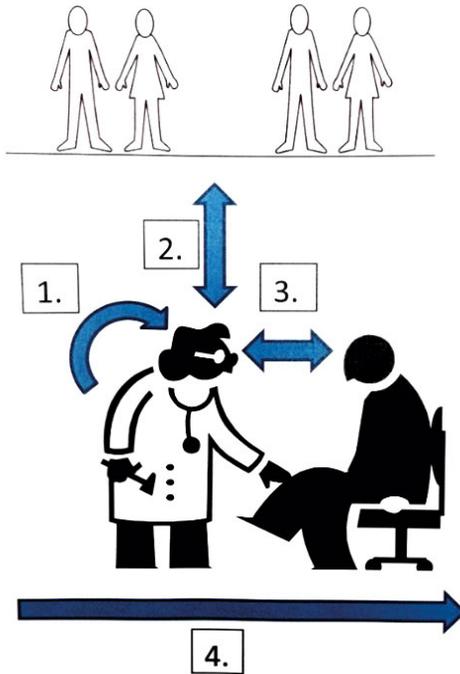
The GPs reported that the COSA decision was complicated by the physician's empathy for the patient, subjective judgments and uncertainties about working conditions.

COSA patients were perceived to be very burdensome compared with other patient categories that one might expect to be more burdensome.

2. Development of cooperation with other professionals, such as physiotherapists, psychotherapists and occupational therapists at primary health care centres in Sweden, has been positive for physicians and patients.

3. The physicians experienced ambivalence or conflicting emotions during patient contact for COSA. Doubts and mistrust sometimes affected how they handled COSA. Clear frustration also emerged among the informants when handling COSA issues.

4. Physicians perceived the new rules to be beneficial to their experience of COSA assignments.



*Figure 11.* Illustration of the four categories that emerged from the analysis of the FGDs.

In summary, physicians at primary health care centres perceived sick leave assignments as burdensome, but clearer rules and cooperation with other professionals have made sick leave assignments less burdensome.

## Paper III

There were no significant differences in returning to the health insurance at 12 months or in reimbursed days during the 12 month follow up. The TEAM group, compared to control, reported a significant increase in working hours per week as well as a significant increase in degree of work-related engagement. (table 8)

Table 8. Logistic and ordinal regressions of the four outcomes in ACT and TEAM groups compared to control.

	<b>Outcome 1</b>	<b>Outcome 2</b>	<b>Outcome 3</b>	<b>Outcome 4</b>
	Returned to health insurance at 12 months (n=308)	More reimbursed days during 12 month follow up (n=308)	Self-reported increase in working hours (n=194)	Self-reported increase in degree of engagement (n=194)
	OR (95% CI)	OR (95% CI)	OR (95% CI)	OR (95% CI)
Control group	1	1	1	1
ACT group	0.72 (0.41-1.24)	0.89 (0.53-1.49)	0.95 (0.46- 1.96)	1.59 (0.77-3.29)
TEAM group	0.61 (0.35-1.06)	0.97 (0.45-1.27)	2.20 (1.09-4.44)	2.42 (1.19-4.95)

OR: Odds ratio; CI: Confidence interval, ACT: Acceptance and Commitment Therapy, TEAM: Multidisciplinary assessment and multimodal intervention

## Paper IV

After 12 months, the proportion reporting an income from work had increased from 39.6 % to 43.6% (n=99). The proportion of participants having “increased employability” or “increased work” was higher among the participants categorised as being motivated to RTW (50.4%) as compared to those less or not motivated (35.0%) (table 9).

Table 9. Odds ratio (OR) and 95% confidence intervals (CI) for RTWSC<sup>1</sup> dichotomised among Swedish men and women aged 20-64, who were obliged to leave sickness insurance after on average 7.9 years of sickness benefits by motivation for RTW and confounders suggested for the association between motivation for RTW and RTWSC dichotomised. (n=199).

		RTWSC dichotomised	
		Crude OR (95% CI)	Adjusted <sup>2</sup> OR (95% CI)
Motivation for RTW	No	1	1
	Yes	1.89* (1.10-3.23)	2.44* (1.25-4.78)
Age Category	20-34	1	1
	35-59	0.30* (0.09-0.98)	0.45 (0.09-2.30)
	60-64	0.24* (0.58-1.00)	0.50 (0.07-3.42)
Employment	Yes	1	1
	No	1.12 (0.66-1.90)	0.88 (0.43-1.80)
Part-time work at baseline	Yes	1	1
	No	2.08* (1.23-3.53)	2.13* (1.04-4.36)
Sick leave duration	Years	0.96 (0.88-1.04)	0.94 (0.85-1.04)
Self-rated health	Good	1	1
	Poor	0.76 (0.44-1.30)	0.73 (0.37-1.48)
HADS depression	Unlikely	1	1
	Possible	1.12 (0.58-2.19)	1.14 (0.44-2.95)
	Probable	0.96 (0.54-1.72)	0.67 (0.26-1.69)
HADS Anxiety	Unlikely	1	1
	Possible	2.02 (0.97-4.23)	2.27 (0.88-5.85)
	Probable	1.65 (0.87-3.12)	1.71 (0.65-4.52)
GSE Self-efficacy	Strong	1	1
	Moderate	1.63 (0.84-3.17)	1.38 (0.56-3.38)
	Low	1.71 (0.78-3.76)	2.17 (0.66-7.10)
Pain	Mild	1	1
	Moderate	0.42 (0.10-1.77)	0.71 (0.14-3.63)
	Severe	0.28 (0.07-1.19)	0.43 (0.08-2.27)

<sup>1</sup> RTWSC=Return to work or system position change

<sup>2</sup> Adjusted for age category, employment, part-time work at baseline, sick leave duration, self-rated health, depression, anxiety, self-efficacy and pain.

p<0.05

In the multinomial adjusted regression models with “unchanged” as the reference category, the participants categorised as being motivated to RTW had comparable ORs: “increased employability” OR 3.08 (95% CI 1.24-7.63) and “increased work” OR 1.58 (95% CI 0.67-3.75) (table 10).

Table 10. Odds ratio (OR) and 95% confidence intervals (CI) for RTWSC<sup>1</sup> among Swedish men and women aged 20-64, who were obliged to leave sickness insurance after on average 7.9 years of sickness benefits by motivation for RTW and confounders suggested for the association between motivation for RTW and RTWSC. (n=199).

	RTWSC							
	Decreased work and employability				Increased employability			
	Crude OR (95%CI)	Adjusted <sup>2</sup> OR (95% CI)	Crude OR (95% CI)	Adjusted <sup>2</sup> OR (95% CI)	Crude OR (95% CI)	Adjusted <sup>2</sup> OR (95% CI)	Crude OR (95% CI)	Adjusted <sup>2</sup> OR (95% CI)
Motivation for RTW								
No	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Yes	0.88 (0.40-1.97)	0.57 (0.20-1.68)	2.19* (1.07-4.47)	3.08* (1.24-7.63)	1.53 (0.76-3.08)	1.58 (0.67-3.75)		
Age Category								
20-34	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
35-59	0.09* (0.01-0.86)	0.11 (0.01-1.61)	0.08* (0.01-0.66)	0.23 (0.02-2.86)	0.12 (0.01-1.09)	0.20 (0.02-2.44)		
60-64	0.17 (0.01-2.04)	0.19 (0.01-3.92)	0.10 (0.01-1.04)	0.51 (0.03-8.90)	0.07* (0.01-0.95)	0.15 (0.01-2.91)		
Employment								
Yes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
No	0.52 (0.20-1.30)	1.09 (0.33-3.62)	1.40 (0.72-2.70)	1.01 (0.41-2.48)	0.62 (0.30-1.31)	0.76 (0.30-1.97)		
Part-time work at baseline								
Yes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
No	0.23* (0.10-0.54)	0.24* (0.08-0.76)	2.56* (1.19-5.49)	3.34* (1.15-9.70)	0.93 (0.48-1.83)	0.87 (0.36-2.12)		
Sick leave duration								
Years	0.95 (0.84-1.08)	0.92 (0.78-1.09)	0.96 (0.87-1.06)	0.94 (0.83-1.07)	0.93 (0.84-1.03)	0.91 (0.80-1.04)		

Table 10 Continued

Self-rated health									
Good	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Poor	0.54 (0.24-1.21)	0.52 (0.18-1.50)	0.81 (0.40-1.65)	0.86 (0.33-2.22)	0.51 (0.25-1.04)	0.48 (0.20-1.15)			
HADS depression									
Unlikely	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Possible	0.95 (0.34-2.71)	1.80 (0.39-8.34)	1.15 (0.47-2.77)	1.52 (0.44-5.27)	1.08 (0.46-2.53)	1.13 (0.33-3.84)			
Probable	0.85 (0.34-2.09)	2.13 (0.45-10.05)	1.18 (0.56-2.50)	0.80 (0.24-2.68)	0.70 (0.32-1.54)	0.83 (0.25-2.77)			
HADS Anxiety									
Unlikely	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Possible	0.58 (0.20-1.68)	0.40 (0.10-1.62)	2.48 (0.89-6.90)	2.80 (0.72-10.82)	1.24 (0.47-3.23)	1.13 (0.35-3.72)			
Probable	0.32* (0.12-0.8)	0.23* (0.05-0.99)	1.77 (0.71-4.40)	1.58 (0.39-6.39)	0.91 (0.40-2.06)	0.95 (0.28-3.22)			
GSE Self-efficacy									
Strong	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Moderate	0.67 (0.27-1.66)	0.50 (0.14-1.86)	1.62 (0.65-4.06)	1.22 (0.36-4.12)	1.34 (0.57-3.18)	1.12 (0.36-3.48)			
Low	0.49 (0.15-1.64)	0.63 (0.09-4.29)	1.90 (0.67-5.37)	2.10 (0.46-9.60)	1.09 (0.38-3.09)	1.59 (0.34-7.39)			
Pain									
Mild	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Moderate	0.72 (0.06-8.50)	1.08 (0.06-20.14)	1.19 (0.10-13.75)	2.46 (0.18-33.12)	0.22 (0.04-1.22)	0.35 (0.05-2.44)			
Severe	0.39 (0.03-4.75)	0.79 (0.04-15.68)	0.71 (0.06-8.26)	1.17 (0.08-16.31)	0.13* (0.02-0.71)	0.27 (0.04-1.93)			

<sup>1</sup> RTWSC=Return to work or system position change. Unchanged reference category.

<sup>2</sup> Adjusted for age category, employment, part-time work at baseline, sick leave duration, self-rated health, depression, anxiety, self-efficacy and pain.

HADS= The Hospital anxiety and depression scale; GSE= General Self-efficacy Scale; \*p<0.05

# Discussion

## Key results

In this thesis, it has been shown that very early multidisciplinary assessment might have the effect that the duration of sick leave is increased. Physicians at primary health care centres perceive sick leave assignments as burdensome, but clearer rules and cooperation with other professionals makes sick leave assignments less burdensome. Also after very long periods of sick leave, rehabilitation with a multidisciplinary rehabilitation team can have an impact on RTW. Motivation for RTW might be an important factor for the effect of a rehabilitation programme on sick leave.

## Interpretation

There is a shortage of studies on very early multidisciplinary assessments for RTW, but some studies have similar results showing increased sick leave, as in paper I. (13, 117-120). Also preventive interventions might increase sick leave (121). There might be a risk, very early in the sick leave period, of focusing too much on symptoms and problems, it might be better to focus on the patient's own resources and opportunities (122). The extensive assessment by the physiotherapist, psychotherapist and occupational therapist early in the sick-leave period might have the effect of focusing more on symptoms and problems. This could adversely affect "recovery expectations", "internal locus of control", "fear-avoidance", "catastrophising", "self-perceived poor health" and "self-efficacy", all factors shown to be predictors of return to work (123-126). This applies to the group level but it does not imply that some individuals may benefit from even very early rehabilitation interventions regarding RTW.

Taking into account previous sick leave and screening by the Örebro Musculoskeletal Pain Screening Questionnaire (ÖMPSQ), both of which can support increased risk of longer sick leave, might be a way to identify some of those individuals at risk of long-term sick leave (127-129).

Although a rehabilitation intervention sometimes does not reduce sick leave, it is important to remember that the subjective well-being of the person might be improved (13, 42).

Paper II supports previous studies indicating that sick leave assignments can be burdensome and also a work environment problem for physicians (38-40, 61, 62, 64-69, 96, 130). A clear regulatory framework and cooperation with other health professionals may be a way to facilitate the sick leave assignment for physicians at primary health care centres.

Papers III and IV showed that rehabilitation after very long-term sick leave may have an impact on RTW. An intervention by a multidisciplinary team showed increased RTW.

Motivation for RTW seems to be an important factor that needs to be considered in vocational rehabilitation. Studies of the importance of motivation for RTW in medical research is scarce. But there is evidence of the importance of motivation for RTW. Motivation has been associated with RTW in earlier studies (83, 84, 87, 131). Motivation for RTW in vocational rehabilitation is of importance to the result of the rehabilitation. Wanting to RTW was connected to people's views of their own possibilities of getting and managing work they wanted (132). To promote work motivation may be an effective means of preventing long-term sick leave for stress-related mental illness (88). There is no evidence on how to affect motivation for RTW (89). When planning an individual rehabilitation processes, there is a clear need to sort out what factors may hide behind a client's weak motivation (86). Meaningful job content and a job which they could do in a satisfactory way according to their own norms and compared to colleagues, could increase motivation for return to work (85). Relationships in terms of co-operation with colleagues and service to clients have also been found important motivating factors for RTW (85).

Although this was a unique group of participants in paper IV, with very long-term sick leave, motivation is perceived as a fundamental characteristic, therefore the result of that motivation for RTW might be important in vocational rehabilitation and might be transferred to other contexts. Motivation for RTW might act as a mediator for the effect on RTW of other factors shown to be associated with RTW, such as "recovery expectations", "internal locus of control", "fear-avoidance", "catastrophising", "self-perceived poor health" and "self-efficacy" (123-126). Within Self-determination theory (SDT) there is also empirical support for the use of the concept of motivation in different contexts (91, 92). Assessing motivation for RTW is suggested as being important prior to interventions concerning vocational rehabilitation.

Poor effect of previously vocational rehabilitation efforts regarding RTW, may from a SDT perspective (91-94), possibly be due to the fact that it did not take sufficient account of the basic psychological needs according to SDT, *competence*, *autonomy* and *relatedness* (94). Interventions that use methods that strengthen motivation for RTW, specifically *autonomous motivation* (according to the *Self-determination theory*), might be advantageous to improve outcome on RTW and improve the psychological wellbeing of people on sick leave (92).

In recent years, physicians and patients in Sweden have experienced increased problems with the approval of medical certificates by the Swedish Social Insurance Agency (133). The Swedish Social Insurance Agency uses “Guidelines for Sick Leave” (Försäkringsmedicinskt beslutsstöd) more strictly, and the “DFA Chain” (DFA-kedjan) as support, in the assessment of medical certificates (2, 6). The “DFA chain” is based on a simplification of ICF, where the importance of contextual factors is less (6, 70, 71).

In clinical practice as a physician at a primary health care centre, contextual factors (environmental and personal factors) in a wider bio-psycho-social perspective is the basis for sick leave and rehabilitation practice, and consequently included in the assessment of a person's work ability, which might explain the perceived increased problem in the approval of medical certificates in recent years.

## Strengths and Limitations

The strength of paper I was the randomised design and the fact that it was carried out in a primary health care setting, where many sickness certification periods begin in this category of patients. The information on sick-leave days was complete, as both data from the electronic patient records and data from the Social Insurance Agency were included.

Weaknesses are that data on sickness absence before inclusion is missing, but randomisation probably minimised any differences. The fact that this study could not randomise the planned number of individuals according to power calculation and that only one centre was involved, adds further weakness. The relatively large number of patients who declined participation before randomisation could have introduced selection bias. The relatively large number of eligible people who declined to participate, could be explained by the fact that some patients were on sick leave for uncomplicated ailments with a good prognosis and considered the extensive assessment unnecessary. Another possible explanation could be the media debate on high sickness absence, which was very intensive when the study was being conducted. This may have been a reason for some patients, eligible for inclusion, to abstain, because they were concerned that an expanded assessment would question their need for sickness absence. This weakens the generalisability of this study. On the other hand, the study gains generalisability, in a Swedish context, from having been performed in an average Swedish county council operated primary health care centre, as regards size, population and access to physicians and other rehabilitation resources.

Qualitative studies cannot show causality but describe and generate an understanding of a phenomenon. Paper II is a qualitative study aimed at describing how GPs in Sweden perceive their work with certification of sickness absence, following the changes in the sickness certification process in 2006-

2010. Transferability was pursued by including GPs from private and public health care; geographic spread including smaller towns and bigger cities in Sweden. Variations in age, gender and professional experience reflected the demographics of GPs at other primary health care centres in Sweden. Similar perceptions of COSA assignments emerged from the various FGDs. These similarities provide transferability and dependability. We pursued confirmability by using open questions during the FGDs, and encouraged informants to talk freely about their experiences of COSA assignments. This gives credibility to the results and enhances the trustworthiness of this study (111, 134). Because social security systems differ between countries, transferability may be reduced, although physicians and patients are comparable between countries. The strengths of this study are the rich material collected from the FGDs and the use of researcher triangulation with different competencies, i.e., two clinically active GPs and two nurses with considerable experience working in health care centres, as well as in qualitative research. The experiences and expertise of the researchers of paper II provide both emic (insider approach) and etic (a more neutral-outsider approach) perspectives on the COSA practice.

Paper III (Vitalis 1) and paper IV (Vitalis1 and Vitalis 2) were based on two cohorts. Participants in both cohorts were recruited in the county of Uppsala by the Swedish Social Insurance Agency (SSIA), among patients who lost their sickness insurance because of the new time limit. All had been on sick leave for a very long time, an average of more than 7 years of sick leave. Despite the long-term sickness absence, there was a large proportion (almost 40%) on part-time sick leave with an income from work. Studies of patients with very long sick leave are rare, because the corresponding categories of patients are lacking in most countries, the study therefore provides knowledge about a unique group but it reduces the external validity. There was also a large drop out of eligible patients before inclusion, and during the study response rates on questionnaires decreased, which could have introduced selection bias. Knowledge of exposure could have affected the outcome. The outcome in paper IV and partially paper III was obtained by questionnaire 12 months after baseline, which could have introduced recall bias. The randomised prospective controlled design of paper III, and balance in baseline characteristics between groups, indicate that observed effects may be attributed to the interventions. Outcome "Self-reported increase in degree of engagement" (Outcome 4) in paper III and outcome "increased employability" in paper IV suggest increased work ability but do not mean full RTW. Due to the very special circumstances of the participants in papers III and IV, where people with very long sick leave were forced to leave sick insurance, the outcomes regarding work ability, in addition to improved health, may be an effect of the changes in social policies.

In order to minimise bias, we used the DAG approach in paper IV. Still, unmeasured confounding probably remains and there is a need to be cautious with regard to causal interpretations.

To test the robustness of the regression analysis in paper IV, a sensitivity analysis was performed with the "worst case", where the missing in outcome was replaced with either 0 or 1. It did not change the result in any significant way. Since paper IV was a cohort study, only associations were shown but not causality.

## Generalisability

Papers I and II were completed in primary health care, where the majority of patients with mental illness and/or musculoskeletal pain are treated. The results might be generalised to countries with similar health care, social insurance and labour market to Sweden. Studies of the experience of sick leave assignments as burdensome have also come from several countries in north-west Europe, which strengthens the generalisability of paper II.

Papers III and IV were based on a unique group of people with very long-term sick leave, forced out of sickness insurance due to new legislation. There was also a large proportion (almost 40%) of part-time sick leave among the participants. The conclusions regarding the effects of multidisciplinary interventions and motivation for RTW, in people on very long-term sick leave, should be interpreted with caution in other contexts. That the participants were mainly women reduces generalisability to men.

# Conclusion

- Very early multidisciplinary assessment, of people on sick leave due to pain and/or mental illness in a primary health care centre, may extend sick leave.
- Physicians at primary health care centres in Sweden perceive sick leave assignments as burdensome, but clearer regulatory framework and cooperation with other professionals has made sick leave assignments less burdensome.
- Multidisciplinary rehabilitation of people on long-term sick leave (full-time or part-time), due to pain and/or mental illness forced to leave sickness insurance, may have an effect on RTW measured as self-reported increase in work-related engagement or working hours.
- Motivation for RTW was associated with RTW or increased employability in rehabilitation of people on long-term sick leave (full-time or part-time), due to pain and/or mental illness forced to leave sickness insurance.

## Clinical implication and future research

A physically and psychologically healthy working environment should ideally prevent sick leave.

The major fluctuations in sickness absence in Sweden appear to be mainly influenced by non-medical factors. The solution therefore is likely to be in political and administrative decisions and not in primary health care centres.

Better methods need to be developed to identify patients, seeking help for pain and/or mental illness in primary health care, and at risk of long-term sick leave, in order to use limited resources for optimal rehabilitation.

Multidisciplinary interventions need to be initiated at the right time. There is support for the premise that both very early (less than 2 weeks) as well as late (after 6 weeks) rehabilitation interventions are less effective regarding RTW. Future research is needed for optimal time to initiate rehabilitation in primary health care centres.

Interventions for RTW sometimes have a minimal effect on RTW and sometimes no, or even a negative effect. Ideally, studies should be carried out in primary health care centres where the majority of patients with pain and/or mental illness are treated. For effect on RTW the patient's workplace probably needs to be involved. The methods should probably involve cooperation between various professionals in a team and be initiated at the right time. How these interventions for increased RTW should best be designed and implemented remains to be shown in future studies.

Motivation for RTW is a factor that is sparsely investigated in medical research. To develop and evaluate methods of assessing and strengthening motivation for RTW might be a means of increasing the chances of RTW in vocational rehabilitation programmes.

# Svensk sammanfattning

## Bakgrund

Under slutet av 1800-talet och första halvan av 1900-talet bildades enskilda frivilliga sjuk- och begravningskassor som gav en låg ersättning till de som var medlemmar. Under 1900-talet började också en del företag ge sociala förmåner främst till tjänstemän. Förmånerna utgjordes av bl.a. av sjuklön, lägre pensionsålder och tjänstepension. En nationell sjukförsäkring infördes i Sverige 1 januari 1955 med syftet att alla skulle få en kompensation för inkomstförlust pga sjukdom. Efter tre dagars karens fick man en skattefri grundsjukpenning på 3kr/dag plus en tilläggsersättning som var inkomstberoende. Tiden med sjukpenning begränsades till maximalt två år. Tidsgränsen togs bort 1963. Under följande årtionden förbättrades ersättningen vid sjukdom, via lagar och kollektivavtal. 1974 höjdes den allmänna nivån i sjukförsäkringen till 90 procent av inkomsten, den blev då också beskattad och pensionsgrundande. 1988 närmade sig ersättningsnivå för de flesta 100 procent. Karensdagar avskaffades för LO-kollektivet 1 december 1987, medan tjänstemän redan tidigare sluppit karensdagar. Under andra halvan 1980-talet ökade sjukfrånvaron vilket ledde till förändringar i sjukförsäkringen. Nivåerna i sjukförsäkringen sänktes 1991 och 1 januari 1992 infördes en sjuklöneperiod på 14 dagar med ersättning från arbetsgivaren på 75% av lön första tre dagar, sen 90% av resterande dagar i den 14 dagar långa sjuklöneperioden. Karensdag återinfördes 1 april 1993. Idag är ersättning vid sjukdom första 14 dagarna knappt 80% men efter ett år sänks det till 75%.

Efter de höga sjuktalen i slutet av 1980-talet minskade sjukfrånvaron till slutet av 1990-talet då sjuktalen började öka igen till en ny topp runt 2003.

Ett flertal initiativ togs därefter av myndigheter för att minska sjukfrånvaron. Sedan 2006 har ”Sjukskrivningsmiljarden” funnits där runt en miljard delats ut årligen till landsting för att stödja och förbättra arbetet med sjukskrivning.

2007 infördes ”Försäkringsmedicinskt beslutsstöd” med rekommendationer om rimliga sjukskrivningstider för att göra sjukskrivningarna mer likvärdiga och rättssäkra.

2008 infördes ”Rehabiliteringskedjan” där arbetsförmågan första 90 dagar ska bedömas mot de vanliga arbetsuppgifterna, dag 91-180 mot andra arbetsuppgifter hos arbetsgivaren och därefter mot arbeten på arbetsmarknaden. Samtidigt infördes en tidsgräns i sjukförsäkringen på 365 dagar inom en 450

dagars period. Under vissa omständigheter kunde ytterligare 550 dagar godkännas. Därefter skulle en arbetsförmågebedömning göras inom arbetsförmedlingen under en tremånaders period. Därefter kunde man återgå till sjukförsäkringen vid sjukdom som nedsatte arbetsförmågan med minst 25%. Inom en 15 månaders period återvände 75% till sjukförsäkringen. Den bortre tidsgränsen i sjukförsäkringen avskaffades 1 februari 2016.

2009 infördes ”Rehabiliteringsgarantin” där runt 1 miljard per år utbetalts t.o.m. 2015, till landsting och andra vårdgivare för att erbjuda personer, som riskerade eller var sjukskrivna, multimodal rehabilitering för personer med muskuloskeletala smärtbesvär och kognitiv beteendeterapi till personer med psykiska besvär.

2011 infördes ”DFA-kedjan” i sjukintyget där Diagnos-Funktionsnedsättning-Aktivitetsbegränsning ska logiskt vara kopplade för att Försäkringskassan ska godkänna sjukintyg. Senaste åren har läkare upplevt att kraven på sjukintygen ökat för att de ska bli godkända.

Sjukskrivning varierar över tid mycket i vissa länder (t.ex. Sverige) men är ganska konstant i andra. Sjuktalet skiljer mellan män och kvinnor. Psykiska diagnoser och muskuloskeletala smärtbesvär är dominerande sjukskrivningsorsaker. Förändringar i sjuktalet avspeglar sig inte i andra hälsomått avseende morbiditet och mot mortalitet. Effekt avseende arbetsåtergång bland sjukskrivna är i många studier låg eller ibland obefintlig jämfört med de stora svängningar i sjuktal som varit i Sverige.

Läkare i många länder upplever sjukskrivningsuppdraget som betungande och ibland även som ett arbetsmiljöproblem.

Övergripande syfte med denna avhandling är att från ett primärvårdsperspektiv få mer kunskap om faktorer inom sjukvården och hos patienter som påverkar sjukskrivning. Därigenom kan patienterna erbjudas bästa möjliga vård, arbete för läkare och andra yrkeskategorier underlättas och användandet av sjukvårdens resurser optimeras.

## Metod

Delstudie I undersöktes effekten av tidig multidisciplinär bedömning på vårdcentralers avseende sjukskrivningslängd i en randomiserad studie med 36 deltagare.

Delstudie II studerades läkares på vårdcentral upplevelse av sjukskrivningsuppdraget efter förändringarna i sjukförsäkringssystemet 2006-2010. Studien var en kvalitativ studie med fokusgrupper med totalt 22 läkare på vårdcentraler. De utskrivna fokusgruppdiskussionerna analyserades med manifest innehållsanalys.

Delstudie III undersöktes effekten av två interventioner på arbetsåtergång hos 308 kvinnor med mycket lång hel- eller deltidssjukskrivning (genomsnitt 7,5 år) som blivit av med sjukpenningen pga av den i rehabiliteringskedjan

införda tidsgränsen i sjukförsäkringen. Deltagarna randomiserades till multidisciplinär utredning och behandling (TEAM), eller till Acceptance and Commitment Therapy (ACT) eller som kontrollfall.

Delstudie IV undersöktes betydelsen av motivationen för arbetsåtergång i samband med rehabilitering. Studieggruppen bestod av 227 personer med mycket lång hel- eller deltidssjukskrivning (genomsnitt 7,9 år) som blivit av med sjukpenningen pga av den i rehabiliteringskedjan införda tidsgränsen i sjukförsäkringen.

## Resultat

Delstudie I blev interventionsgruppen, som fick en tidig multidisciplinär bedömning, sjukskrivna signifikant fler dagar än kontrollgruppen (58 dagar interventionsgrupp, 36 dagar kontrollgrupp  $p=0,036$ ).

Delstudie II framkom att läkare på vårdcentraler upplever sjukskrivningsuppdraget betungande men det har blivit mindre betungande efter förändringarna i sjukförsäkringssystemet 2006-2010. Samarbete med andra yrkeskategorier underlättade också sjukskrivningsuppdraget för läkarna på vårdcentraler.

Delstudie III gav TEAM intervention ökat antal arbetstimmar (OR 2,20, 95% CI 1,09-4,44) och arbetsrelaterade aktiviteter (OR 2,42, 95% CI 1,19-4,95).

Delstudie IV visades en association mellan motivation för arbetsåtergång innan rehabilitering och arbetsåtergång eller ökad anställningsbarhet (OR 2,44, 95% CI 1,25-4,78).

## Diskussion

I denna avhandling har påvisats att mycket tidiga rehabiliteringsinsatser kan leda till längre sjukskrivning. Förändringarna i sjukförsäkringssystemet liksom samarbete med andra yrkeskategorier underlättar sjukskrivningsuppdraget. Även efter mycket långa sjukskrivningsperioder kan rehabiliteringsinsatser ha effekt på arbetstimmar och arbetsrelaterade aktiviteter. Motivation för arbetsåtergång är en faktor av betydelse vid rehabilitering av personer med mycket lång sjukskrivning.

Sjukskrivning ska helst förebyggas med en god arbetsmiljö. Stöd finns för att samma riskfaktorer som kan öka risk för sjukskrivning i de diagnoser som är vanligast vid sjukskrivning (muskuloskeletala smärtor och psykiska diagnoser) också kan öka risk för andra sjukdomar som hjärtkärlsjukdomar.

Stöd finns för att för tidiga rehabiliterings insatser (mindre än 2 veckor sjukskrivning) och för sena insatser (mer än 6 veckor sjukskrivning) kan vara mindre effektiva avseende arbetsåtergång. Men även väldigt sena rehabiliteringsinsatser kan ha effekt och då kan motivationen för arbetsåtergång vara en faktor av betydelse.

Fortsatt forskning behövs för att få bättre kunskap om vilka individer som riskerar att bli långtidssjukskrivna och när i sjukskrivningsförloppet rehabilitering insatser ska sättas in och hur rehabiliteringen ska utformas. Det är sannolikt även viktigt att personens arbetsplats involveras i rehabiliteringen

Motivationens betydelse för arbetsåtergång är sparsamt studerad. Metoder behöver utvecklas för att mäta motivationen tillförlitligt och för att kunna stärka motivationen.

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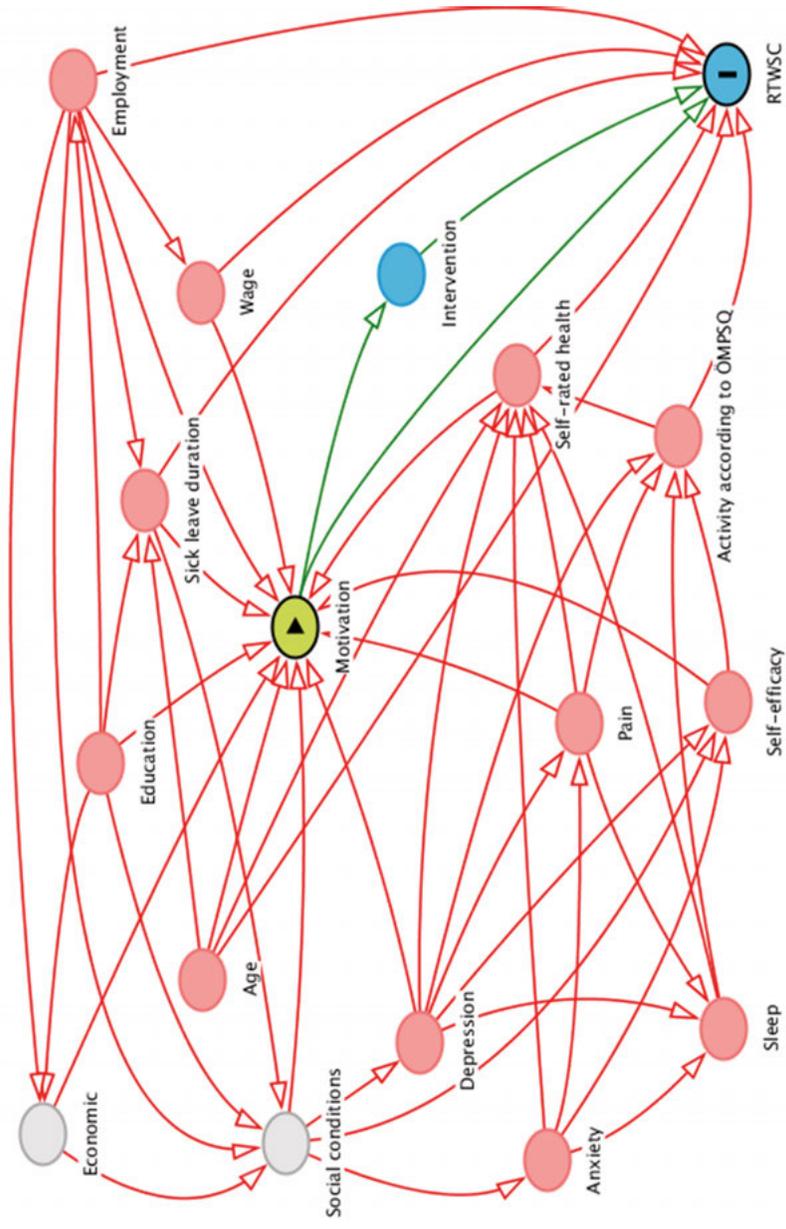
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