Improving Work Ability and Return to Work among Women on Long-term Sick Leave

Linda Ahlstrom

Institute of Medicine
at Sahlgrenska Academy
University of Gothenburg

UNIVERSITY OF GOTHENBURG

Gothenburg 2014

: Improving work ability and return to work

Improving Work Ability and Return to Work among Women on Long-term Sick Leave

linda.ahlstrom@amm.gu.se
ahlstromlinda@hotmail.com

ISBN 978-91-628-9093-3
(printed)
ISBN 978-91-628-9095-7
(e-pub) Electronic version available at: http://hdl.handle.net/2077/35953

Printed in Gothenburg, Sweden 2014
Kompendiet

En vanlig dag

Jag har det bra
Mitt liv rullar på
Ibland har jag tråkigt
Vad sakta tiden går
Men oftast har jag roligt
Då känns allting bra
Idag är en bra dag, idag är det bra

Tänk om man satte allt i perspektiv
Man kunde vara fattig och sjuk i ett annat liv
Inte ha några vänner, familj eller nån hund
Ingen som bryr sig om en, just för en liten stund

Men jag har det bra idag
Jag har det bra idag
Det är en vanlig dag och jag har det bra
Ulrik Munther (2009)

Improving Work Ability and Return to Work among Women on Long-term Sick Leave

ABSTRACT

The overall aim of this thesis was to gain new knowledge of factors and interventions that improve work ability and return to work (RTW) among women on long-term sick leave from human service organizations (HSOs). The specific aims of the studies were: to evaluate the associations between the self-rated Work Ability Index (WAI) and Work Ability Score (WAS), and the relationship with prospective sick leave, symptoms, and health (Paper I); to investigate whether intervention with myofeedback training or intensive muscular strength training could decrease pain and increase work ability among women with neck pain (Paper II); to examine the associations between workplace rehabilitation and the combination of supportive conditions at work with work ability and RTW over time (Paper III); and to explore experiences, views, and strategies in the rehabilitation process for RTW (Paper IV). This thesis is based on a prospective cohort study (n=324) and a randomized controlled study (RCT) (n=60, participants with neck pain). Both quantitative and qualitative methods were used. The data collection consisted of questionnaires, laboratory-observed data, register-based data, and interviews. The results showed a very strong association between WAI and WAS, and results predicted future sick leave degree, health-related quality of life, vitality, neck pain, self-rated general health, self-rated mental health, behavioral stress, and current stress (Paper I). In the RCT (Paper II), individuals in the myofeedback intervention group increased their vitality and work ability over time and individuals in the intensive musculoskeletal strength training group increased their WAI, WAS, and mental health over time. WAI, WAS, and RTW increased over time among individuals provided with workplace rehabilitation and supportive conditions at work (Paper III) such as a sense of feeling welcome back at work, influence at work, possibilities for development, degree of freedom at work, meaning of work, quality of leadership, social support, sense of community, and work satisfaction. Women described (Paper IV) how they were striving to work and how they had different views, strategies, and approaches in the rehabilitation process for RTW. They expressed a desire to work, their goals for work, and their wishes for work. In the rehabilitation process for RTW they described their interaction with stakeholders as either controlling the interaction or struggling in the interaction. They described strategies to cope with RTW in terms of yo-yo (fluctuating) working: yo-yo working as a strategy or yo-yo working as a consequence. This thesis identifies factors of importance in improving work ability and RTW among women on long-term sick leave from HSOs. For women with neck pain, the intervention study showed feasibility of the intervention and demonstrated improved work ability and decreased pain (Paper II). The intensive muscular strength training program, which is easy for the individual to learn and perform at home, was associated with increased work ability. The results regarding rehabilitation highlight the importance of integrating workplace rehabilitation with supportive conditions at work to increase work ability and improve RTW (Paper III). Women expressed that they were striving to work and that they wanted to work (Paper IV). These women were “going in and out” of work participation (yo-yo working) as a way to handle the rehabilitation process. For assessing the status and progress of work ability among women on long-term sick leave, the single-question WAS may be used as a compliment to the full WAI as a simple indicator (Paper I).

Keywords: work disability, sickness absence, back to work, randomized controlled trial, chronic pain, musculoskeletal disorder, rehabilitation activity, female, cohort, longitudinal data, grounded theory

ISBN: 978-91-628-9093-3 (printed)

ISBN: 978-91-628-9095-7 (e-pub) Electronic version available at: http://hdl.handle.net/2077/35953

SAMMANFATTNING PÅ SVENSKA

Många människor är långtidssjukskrivna i Sverige idag, största andelen av dem är kvinnor med muskeloskeletala besvär och/eller psykiska besvär. Långtids-sjukskrivningar och individers minskade arbetsförmåga har blivit ett folkhälsoproblem med lidande för individen samt negativa effekter och kostnader för samhället och arbetsgivare som följd. Det övergripande syftet med avhandlingen var att generera ny kunskap om faktorer och åtgärder som kan förbättra arbetsförmågan och öka återgång i arbete bland långtidssjukskrivna kvinnor, som arbetar inom så kallade human serviceyrken (HSY). Avhandlingens delsyften var; att utvärdera sambandet mellan självskattad arbetsförmågeindex (Work Ability Index, WAI) och ett arbetsförmågepoäng (Work Ability Score, WAS), och även samband med framtida sjukskrivning, symptom och hälsa (Artikel I). (*WAI är ett självskattat frågeformulär som används för att utvärdera individers arbetsförmåga och resurser i förhållande till arbetets krav, det består av sju dimensioner. WAS är en enkel fråga från WAI formuläret, Den nuvarande arbetsförmågan jämfört med när den var som bäst, en poängskala 0-10).* Att undersöka om en intervention/åtgärd med myofeedback- träning eller intensiv (muskel) styrketräning, minskade smärtan och ökade arbetsförmågan, bland kvinnor med nacksmärta arbetandes inom HSY (Artikel II). (*Myofeedback- träning innebär att individen bar en sele runt axlarna med elektroder, denna sele med elektroderna gav återkoppling (vibration och ljud) till individen när musklerna varit spända och inte kunnat vila tillräckligt. Selen användes minst 2 timmar 4 gånger i veckan, under 4 veckor. Selen kan bäras hemma och vid andra aktiviteter. Intensiv (muskel) styrketräning, innebär att individen utförde ett enkelt styrketräningsprogram i hemmet, 2 gånger dagligen i 4 veckor. Programmet tog 10 minuter att genomföra).* Att undersöka samband mellan rehabiliteringsåtgärder på arbetsplatsen i kombinationen med stödjande förhållanden på arbetsplatsen ökade arbetsförmågan och återgång till arbete över tid. (Artikel III). Att undersöka erfarenheter, uppfattningar och strategier i rehabiliteringsprocessen för återgång i arbete bland långtidssjukskrivna kvinnor, med nacksmärta, arbetandes inom HSY (Artikel IV). Dessa frågeställningar undersöktes med data från en kohort (en grupp med 324 kvinnor) som följts över tid - och en randomiserad kontrollerad studie (RCT), med 60 kvinnor med nacksmärtor. Datainsamlingen bestod av enkäter, observerade laboratoriedata, registerbaserad data och intervjuer. Analysmetoder som används i delarbetena var både kvantitativa och kvalitativa. Resultatet visade att frågeformuläret WAI och enkelfrågan WAS, predicerade framtida sjukfrånvaro, hälsorelaterad livskvalitet, vitalitet, nacksmärta, hälsa, och stress (Artikel I). Resultatet av interventionerna i RCT visade att individer i myofeedback gruppen ökade sin vitalitet och arbetsförmåga över tid, individer i den intensiva (muskel) styrketräningsgruppen ökade i arbetsförmåga (WAI) och mental hälsa över tid

(Artikel II). Individerna som hade rehabiliteringsåtgärder på arbetsplatsen och stödjande förhållanden på arbetet (Artikel III) såsom att de kände sig välkomna tillbaks till jobbet, hade inflytande på arbetsplatsen, upplevde möjligheter till utveckling, kände frihet i arbetet, känsla av meningsfullhet på arbetet, uppskattade kvaliteten på ledarskap, kände socialt stöd, upplevde känsla av gemenskap och hade arbetstillfredsställelse, ökade sin arbetsförmåga (WAI och WAS) och återgång i arbete över tid. Långtidssjukskrivna kvinnor med nacksmärta arbetandes inom HSY uttrycker att de strävade efter att arbeta (Artikel IV), de ville arbeta, de uttryckte att de antingen styr samarbetet med aktörer (Arbetsgivaren, Hälso- och sjukvård, Försäkringskassan, Arbetsförmedling etc.) eller kämpar i samarbetet med aktörer i rehabiliteringsprocessen för att kunna öka sin arbetsförmåga och återgå i arbete. Kvinnorna beskrev olika strategier för att klara av återgång i arbete i termer av ”jojo” arbetsnärvaro (fluktuerande arbetsgrad): ”jojo” arbetsnärvaro som en strategi eller ”jojo” arbetsnärvaro som en konsekvens. Slutsatserna var att för kvinnor med nacksmärta var interventionerna enkla att genomföra och de förbättrad arbetsförmågan och minskade smärta hos individerna. Den intensiva (muskel) styrketräningen, var lätt för individen att genomföra och det var också lätt att instruera och coacha deltagarna. Denna metod hade ett samband med ökad arbetsförmåga. Det är viktigt att integrera rehabiliteringen på arbetsplatsen med stödjande förhållanden på arbetsplatsen för att öka arbetsförmågan och förbättra återgång i arbete bland långtidssjukskrivna kvinnor. Slutsatsen är att kvinnor till viss del går in och ut i arbetsdeltagandet, med perioder av sjukfrånvaro och med perioder av arbete. Kunskap om de erfarenheter, åsikter och strategier som används bland långtidssjukskrivna kvinnor med nacksmärta, i rehabiliteringsprocessen för att återgå arbete skulle kunna stödja de olika aktörerna i samarbetet med individerna i rehabiliteringsprocessen för att öka arbetsförmågan och medvetenheten om skillnader mellan olika individers strategier. Faktorer som är viktiga för förbättrad arbetsförmåga och återgång i arbete identifierades. Denna nya kunskap från de olika studierna kan användas i den praktiska vården och av berörda aktörer. Intervention med intensiv (muskel) styrketräning skulle kunna utvecklas och användas inom hälso- och sjukvård för att minska nacksmärta och öka arbetsförmågan. För bedömning av status och utvecklingen av arbetsförmåga bland långtidssjukskrivna kvinnor kan en enkel fråga, WAS, användas som en enkel indikator på arbetsförmågan. Detta bör endast användas som ett komplement till arbetsförmågeindexet, WAI vilket ger en mer fullständiga bedömning av arbetsförmåga.

LIST OF PAPERS

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

I. **Ahlstrom, L**., Grimby-Ekman, A., Hagberg, M., & Dellve, L. (2010). The work ability index and single-item question: associations with sick leave, symptoms, and health - a prospective study of women on long-term sick leave. Scand J Work Environ Health, 36(5), 404-412.

II. Dellve, L., **Ahlstrom, L**., Jonsson, A., Sandsjö, L., Forsman, M., Lindegård, A., Ahlstrand, C., Kadefors, R., & Hagberg, M. (2011). Myofeedback training and intensive muscular strength training to decrease pain and improve work ability among female workers on long-term sick leave with neck pain: a randomized controlled trial. Int Arch Occup Environ Health, 84(3), 335-346.

III. **Ahlstrom, L**., Hagberg, M., & Dellve, L. (2013). Workplace rehabilitation and supportive conditions at work: a prospective study. J Occup Rehabil, 23(2), 248-260.

IV. **Ahlstrom, L**., Ahlberg, K., Hagberg, M., & Dellve, L. (2014). Women with neck pain on long-term sick leave – strategies and approaches used in the rehabilitation process for returning to work. (Submitted)

CONTENT

ABBREVIATIONS

ANOVA	Analysis of variance
HRQoL	Health-related quality of life
HSO	Human service organization
PCC	Person-centered care
PR	Prevalence ratio
RCT	Randomized controlled trial
RTW	Return to work
WAI	Work Ability Index
WAS	Work Ability Score
95% CI	95% confidence interval

1 INTRODUCTION

There is a high prevalence of employees on long-term sick leave in Sweden (Stattin, 2005, Larsson et al., 2014). Long-term sick leave and incapacity for work has become a public health problem both in Sweden and in other countries within the Organization for Economic Co-operation (OECD), causing a great deal of suffering to individuals and negatively affecting employers (Gabbay et al., 2011, Tengland, 2010). In these countries, 6% of the working population receive long-term sickness absence and incapacity benefits at a cost of 2.0% of gross domestic product. Among human service organization (HSO) workers, cases have been increasing since 2009, with the majority (61%) occurring among women (Ighe and Lidwall, 2010). Swedish figures from 2012 show 15 long-term sick leave cases per 1000 people employed in businesses and 27 per 1000 employed in municipalities. Among those on long-term sick leave, 29% of women and 24% of men suffered from a disease of the musculoskeletal system, while 33% of women and 29% of men were diagnosed with a mental health disorder. The professional groups most affected by chronic illness among women in local government were nurses, nursing assistants, and social workers.

Prevention of illness and management of work ability and return to work (RTW) are highly prioritized on the social and political agenda in Sweden (Alexanderson and Hensing, 2004, Alexanderson and Norlund, 2004). It is crucial to have an effective RTW process, as persistent long-term sick leave is a critical social problem which affects individuals' well-being and finances. These problems are especially acknowledged among women working within HSOs (Pransky et al., 2005). The primary purpose of the rehabilitation process is to improve the individual's health, quality of life, and possibilities to act as an independent individual within society, through maintaining their work ability and eventually returning to work. Using a single outcome measure for work ability could be difficult, as there is no instrument covering all aspects of work ability and RTW. Further information is needed, including the individual's perceived work ability, level of participation, or sustainable RTW. The present thesis focuses on measures of work ability such as the Work Ability Index (WAI), Work Ability Score (WAS), and degree of sick leave or degree of working. There has recently been increasing interest in the promotion of a sustainable working life, which has led to the recognition that there is a need for increased knowledge about what factors in the rehabilitation process can promote work ability and RTW among women, and what conditions are important for how workers manage their work.

There is also a need to develop an understanding of how the rehabilitation process is perceived among women on long-term sick leave, what strategies the process

implies, and what could be favorable conditions to facilitate RTW among women working within HSOs, particularly women with neck pain. HSO employees include workers in schools, preschools, home care services, and nursing or disabled-care homes who are in direct contact with clients or responsible for cleaning, cooking, or administration, often employed by municipalities. For most individuals, being able to work and belonging to the work force is important; it is related to their own primary goals, and it is also highly beneficial to society.

Neck pain is one of the most common problems among individuals on sick leave in Sweden; the prevalence of back disorders (neck included) is 31% (Hansson and Jensen, 2004). A number of studies have reported difficulties in rehabilitation and RTW from long-term sick leave in general and because of neck pain in particular (Ekbladh, 2008, Nielsen et al., 2006, Savikko et al., 2001). The overall aim of rehabilitation for the individual is to maintain work ability, and to return to work. Despite numerous studies of the effect of rehabilitation during the last decade, there is still a need for increased knowledge about the effect of different rehabilitation measures and interventions, and for whom and when different kinds of interventions work successfully. There is particularly a need for increased knowledge about beneficial conditions for rehabilitation and RTW among individuals on long-term sick leave for neck pain. The incidence of long-term sick leave and permanent disability is higher among women than among men; this is related to musculoskeletal and mental health problems (Dellve et al., 2006), and specifically to neck pain (Messing et al., 2009). In Sweden in 2013, the number of compensated sick leave days per registered full-time employee (age 16-64, and not including individuals with permanent disability) was about 11 days for women and about 6 days for men (Ighe and Lidwall, 2010). In general, more women than men are on long-term sick leave (Larsson et al., 2014). In Sweden today, with a high prevalence of individuals on long-term sick leave, there is a demand for measures of work ability that will allow assessment and evaluation of success or failure in the rehabilitation process for these women, in order to enhance work ability and RTW.

The aim of this thesis was to develop methods of intervention and to investigate factors that improve work ability and RTW among women on long-term sick leave from HSOs, and to contribute to a deeper understanding of chronically ill women's strategies and views of the RTW rehabilitation process, focusing specifically on women with neck pain.

1.1 Health

Health is a dynamic and multi-dimensional state of well-being. It includes individuals' physical, mental, and social ability, and does not necessarily require

the absence of disease or injury/infirmity; it is a state which can assure the complexity of a good life given the circumstances (Bircher, 2005, Nordenfelt, 1986, Nordenfelt, 2006, Organisation, 1994). Every individual is special and different from others, and has their own needs, wishes, and goals for the future, where "the future" could be as close as the next day. In 1986, the World Health Organization (WHO) launched the Ottawa Charter for Health Promotion, which defined health as "a resource for everyday life, not the objective of living". Health is a positive concept, emphasizing social and personal resources as well as physical capacities. It has been suggested that the concept of health should be modernized to "health as the ability to adapt and to self-manage" (Huber et al., 2011). One issue with the definition is the use of the word "complete" in relation to well-being. Today, the majority of individuals with chronic disease would consider themselves as having complete health. Their health could be affected by their condition, but does not necessarily affect and control their work ability (Sturesson et al., 2013). Overall health is achieved through a combination of physical, mental, and social well-being. Physical well-being includes individuals' ability to eat, sleep, exercise, look after their body, and control their lives. Mental well-being includes individuals' ability to handle the stress and strain of daily life, ability to maintain relationships with others, learning ability, and being optimistic. Social well-being includes individuals' health, network, capability of networking, social support, and interaction with other individuals such as friends, family, colleagues, and partners. All these aspects of health are dependent upon each other, and need to be balanced for the individual to experience good health. Any discrepancy between the health resources needed and the health resources actually available to the individual will create a gap between demands and resources, and can result in work disability (Landstad et al., 2009a, Landstad et al., 2009b). Demands and resources can both develop in diverse directions, and may change over time. Good health is essential for work presence and good work ability (Thorsen et al., 2013), although today most individuals with health problems will continue to work, having adapted to their disease or disorder (Martimo et al., 2007). In addition, working is known to be good for health and well-being (Law et al., 1998, Hammell and Iwama, 2012). A review showed that work-related outcome measures are not commonly used in treatment of individuals (Elfering, 2006).

Neck pain is a common symptom affecting health, well-being, and work ability; it affects family and society as well as the individual seeking health care or on sick leave (Cote et al., 2008, Hogg-Johnson et al., 2008, Holm et al., 2008, Nordin et al., 2008). The best practice in treating neck pain is still unclear; educational interventions have not shown success (Haines et al., 2009). The lifetime prevalence of back problems (neck included) is 55-77% (Hansson and Jensen, 2004). A majority of the general population will experience neck pain during their

life course (Hogg-Johnson et al., 2008), but only some of them will develop chronic neck pain (i.e. lasting longer than 90 days). Neck pain is more common among women, and Scandinavian countries report higher mean scores than Europe and Asia (Fejer et al., 2006). Pain is subjective, and individuals experience pain in numerous different ways. The relationship between pain and disability is not a clear one. Chronic neck pain disorders are often non-specific, in that the specific structure that causes pain cannot be identified. In some individuals, pain episodes tend to persist and the pain can become chronic.

1.2 Work ability

The concept of work ability is multidimensional. It includes the individual's physical, mental, and social capabilities; their resources; their specific physical and mental work demands; environmental and organizational conditions; and the surrounding environment (Sluiter and Frings-Dresen, 2008, Ilmarinen, 2005, Dekkers-Sanchez et al., 2013, Pransky et al., 2005, Ilmarinen, 2009).

A literature review by Fadyl et al. (2010) identified six important categories that contribute to work ability: physical function, psychological function, thinking and problem solving skills, social and behavioral skills, the workplace, and factors outside the workplace (Fadyl et al., 2010). Sandqvist and Henriksson (2004) described three types of factor in their review: personal, environmental, and temporal factors (Sandqvist and Henriksson, 2004). In order to have professional competence, individuals need theoretical and practical knowledge as well as skills (Nordenfelt, 2008). Knowledge, strengths, and attitudes provide the crucial conditions. There is debate over whether or not it is the individual's own decision as to how they accomplish their work tasks — if they perform at a high level or if they do minimal work — provided they have the capabilities, competence, and skills. Nordenfeldt argues that to be able to do their work well, the individual also needs to have enthusiasm (Nordenfelt, 2008) and willingness (will/motivation/interest). If an individual has the practical knowledge to perform a task but does not have the skills to do it, they are lacking complete ability.

Work is one of the activities normally performed in daily life, and functioning at work is described as the fit between the individual's resources, working demands, and the surrounding environment (Sandqvist and Henriksson, 2004). Having the ability to perform work well is a dynamic relationship between the individual, the individual's activities, and the environment; a discrepancy between these factors could lead to reduced and inefficient work and/or part-time or full-time absence from work. Most individuals believe in and express the importance of working and being involved in the working context. This may have many reasons, including economic imperatives, social identity, social networking, and having

meaningful tasks to do. Often individuals who are in work score better on measures of quality of life, physical functioning, and health (Law et al., 1998, Hammell and Iwama, 2012). There is also a common-sense idea that healthy people should be able to work, and should have the opportunity for work; ill health could reduce this ability (Tengland, 2010), and so workplaces should provide accommodations to enable individuals to remain at work or to RTW (de Vries et al., 2011, Hultin et al., 2010, Johansson and Lundberg, 2004). To be able to assess and evaluate the measures taken to enhance work ability and RTW for individuals both in the clinic and in research, there is a need for measuring health-related work outcomes. This allows assessment of the effectiveness of health services, targeting prevention and intervention programs towards individuals, evaluating the effectiveness of work reorganization projects, and improving interaction between stakeholders.

Most studies of work ability focus on work disability rather than work ability. One reason for this might be that insurance providers usually focus on the injury/disease and the assessment for sickness certificate, in order to be able to provide economic compensation to the worker. However, these concepts have not been clearly defined, which has led to confusion with negative effects (Tengland, 2010). Some researchers choose to use the term “work capacity”, but this thesis uses the term “work ability”. To date, there is no clear definition and no clear consensus on how to assess an individual’s work ability (Seing et al., 2012, Sturesson et al., 2013, Ståhl et al., 2011). A recent study showed that occupational health care workers in Finland and the United Kingdom differed substantially in their understanding and knowledge of work ability and their use of the WAI; understanding, knowledge, and use of the WAI were much higher in Finland (Coomer and Houdmont, 2013). Disease/disorder and work (dis)ability are the two basic concepts that make up the social insurance system in Sweden. It is important to find out how individuals perform and function at work (i.e. their work ability). The aim of assessing work ability is to detect problem areas which prevent the individual from performing at work, and to tailor interventions when needed. It is important to recognize that work ability and RTW are not definite measures of lasting effects (Elfering, 2006); they are ongoing processes. Different measures of individual work ability are used for different reasons. Examples of self-report instruments are the WAI (Torgen, 2005, Tuomi et al., 1998, Ilmarinen, 2007, Sjogren-Ronka et al., 2002), the Worker Role Interview (Velozo et al., 1999, Velozzo et al., 1998), the Work Limitation Questionnaire (WL-26, WL-27) (Amick et al., 2004, Amick et al., 2000), the Work Instability Scale (Gilworth et al., 2006, Gilworth et al., 2009), and the Functional Capacity Index (MacKenzie et al., 1996). Reasons for using these tools to measure work ability include the desire to assess ability to RTW, the impact of disability on work, the economic impact of health-related work disability, and the dimensions of work ability loss,

as well as the need to screen for potential work ability loss. This thesis uses the WAI and WAS as outcome measures for work ability. The WAS consists of a single item, based on the first question in the full WAI (Gould et al., 2008). Papers I and II use the concept of WAS (i.e. a single item for work ability) but not the phrase itself, as they were published before the phrase came into use.

The concept of work ability is described in detail by Ilmarinen et al., using the metaphor of a house (Figure 1) (Ilmarinen, 2005, Ilmarinen and Tuomi, 2004).

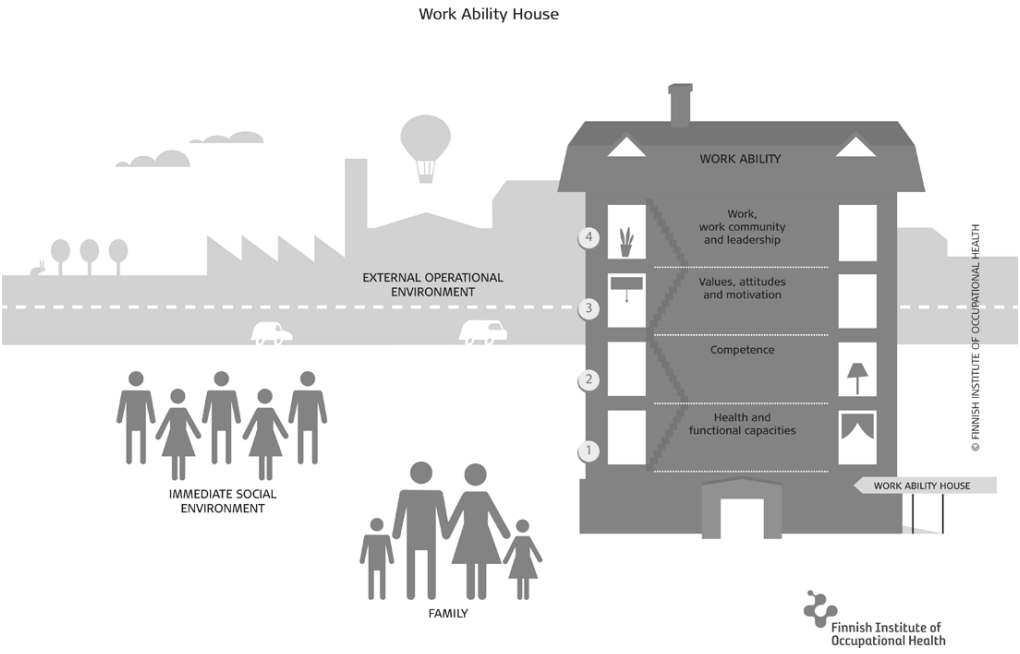

Figure 1. Work ability using the metaphor of a house (Finnish Institute of Occupational Health).

1.2.1 The Work Ability Index

The WAI is an instrument designed for occupational health services. It is used worldwide to assess work ability, both in clinical practice and for research purposes (Ilmarinen, 2007, Ilmarinen, 2009). Its strengths are that it is widely used and it is a validated measure of work ability. This instrument is described in detail in Chapter 3 (Methods and Material).

One of the main criticisms raised against the WAI is that it contains many disparate questions which measure work ability more or less indirectly (e.g. relating to diagnosis of chronic conditions and sick leave). This may have

implications when the WAI is used among employees already on long-term sick leave; also, it may give too much weight to diagnoses which are not necessarily related to work ability. Researchers have suggested that the WAI does not capture the most up-to-date conceptualizations of work ability, and that the sum score is heavily influenced by health issues (Bohle et al., 2010) even though individuals with chronic diseases may experience good or excellent work ability (Martimo et al., 2007). The scale might exhibit a ceiling effect, making it difficult to demonstrate improvements in work ability, particularly among women on long-term sick leave with small changes in work ability. Although working conditions and work organization influence workers' health and functional capacity, they are rarely assessed when it comes to work ability (Bohle et al., 2010). There is also only limited theoretical research on how factors such as the organizational environment, employment conditions, and individual characteristics can influence individuals' work ability. Due to the theoretical complexity and practical issues, the single-item question on work ability (the WAS) has often replaced the full WAI in clinical work and research (Sluiter and Frings-Dresen, 2008, de Croon et al., 2005). The single-item WAS can be beneficial in terms of simplicity, cost, and ease of interpretation (Bowling, 2005), and there are recent studies suggesting that the WAS could be used as a valid and simple indicator for assessing the status and progress of work ability (El Fassi et al., 2013, Roelen et al., 2014). A Danish study found that a one-item work ability measure with four answer categories could predict sick leave. Women have been shown to score lower than men on the WAI (Costa et al., 2005). A Swedish study found that physical work ability was the strongest explanatory factor for the total association between socioeconomic status and being sick-listed in women (Löve et al., 2012).

1.2.2 Long-term sick leave

The prevalence of employees on long-term sick leave (≥60 days) is approximately 6% among the working population in Sweden, with the highest prevalence seen among women (Borg et al., 2006) working in HSOs (Leijon et al., 2004, Ighe and Lidwall, 2010, Larsson et al., 2014, Dellve et al., 2006, Borg et al., 2006). Long-term sick leave is still increasing among HSO workers, and the most frequent reason for sick leave is poor mental health. A Swedish study using a randomized working population sample from a major region found that women were more likely than men to be on sick leave (Löve et al., 2012), and physical work ability was the strongest explanatory factor. Another Swedish study showed that the risk for long-term sick leave and disability pension was similarly greater for female workers as well as for older workers (Larsson et al., 2014, Hansson and Jensen, 2004), and this is also the case in other Scandinavian countries (Thorsen et al., 2013).

There is no international consensus on the definition and time limit for long-term sick leave. Most studies use a time period between two weeks and two years, and the understanding of "long-term" seems to vary between different contexts. In Sweden, the Social Insurance Agency's definition of long-term sick leave is ≥60 days (Ighe and Lidwall, 2010). There is also the issue of defining RTW, and distinguishing between one day's RTW and sustainable RTW; should there be a timeline of at least two weeks, or three months? In Sweden, for example, individual are able to return to work part-time. The vocabulary normally used to describe sick leave, work ability, and RTW can be somewhat confusing because it varies between countries and contexts; it also differs between the literature and everyday language. Research has found that primary health care centers lack policies for handling sick leave, and the responsibility for assessments of work ability is often forgotten (Nilsing et al., 2014). Health care workers need consensus when assessing work ability and making decisions regarding sick leave (Dekkers-Sanchez et al., 2013). Often individuals on sick leave experience symptoms of fatigue, pain, and anxiety but find these symptoms difficult to express clearly. In addition, professionals' lack of knowledge about treating health conditions that affect individuals' work ability leads to indecision in professional assessments of the individual and in how to improve health and work ability (Nilsing et al., 2012).

The illness flexibility model is an explanatory model of sick leave including several factors affecting and explaining the actions taken in this process, Figure 2 (Johansson, 2007). According to this model, when an individual experiences injury or disease, they make a decision on what their action will be: to remain at work despite their disability, or to take sick leave. If they take sick leave, there are additional decisions to make. RTW could be at different levels of working degree, or the individual could leave the labor market and become unemployed or take a disability pension. Other possible actions include changing work direction, becoming a student, choosing to emigrate, or even dying. Push and pull factors for different directions will affect which way the individual will go (Johansson, 2007).

Work ability in the illness flexibility model is explained by the individual's capacity, skills, demands, and requirements from work. Demands and requirements from work depend on opportunities for the individual to adjust their work according to their health. Individual motivation plays a central role in this model; what the individual believes they ought to do, or what they desire to do, in terms of taking action in their current state of illness in relation to work. These directions depend on the negative consequences of not working while ill, the negative consequences of working with illness, wanting to work despite illness, and positive incentives to stay absent while ill. The outcome of illness could be

sick leave from work, remaining present at work despite illness, RTW, or exclusion from work (Johansson, 2007).

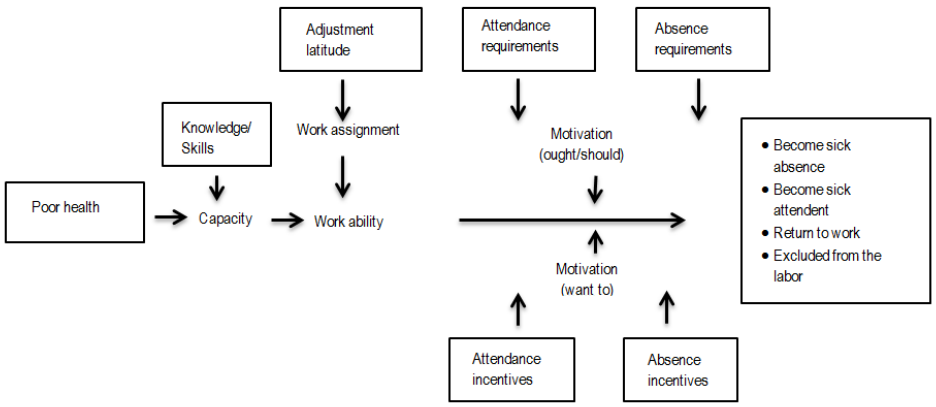

Figure 2. The illness flexibility model (Johansson, 2007).

For individuals in possible need of sick leave, the first contact with the health care services is usually with primary health care. However, research has shown a lack of policies at primary health care centers regarding how to handle sick leave, and the responsibility for assessments of work ability is often forgotten (Nilsing et al., 2013). Further, physicians need consensus when assessing the work ability of individuals on long-term sick leave (Dekkers-Sanchez et al., 2013). Often individuals acknowledge symptoms of pain, fatigue, and anxiety in relation to their neck disorder, but they do not express these symptoms clearly. Having neck pain does not imply that an individual will seek medical care, and it is difficult for a health care professional to objectively assess this pain due to a lack of validated methods (Nordin et al., 2008). However, there are validated self-report instruments for assessing and evaluating an individual's pain status and the influence of pain. The relationship between pain, disability, and sick leave is unclear, and it is difficult to assess the impact on work function. Physicians in a Dutch study came to a consensus on factors of importance for individuals on long-term sick leave, consisting of both personal and environmental dynamics, and not necessarily focusing on the individual diagnoses (Dekkers-Sanchez et al., 2013). Physicians often have poor knowledge about the patient's working demands and hence their work ability, which could lead to indecision in physicians' assessments of work ability and the decision of sick-leave degree (Nilsing et al., 2013).

Women working within HSOs are at greater risk for long-term sick leave. Other risk factors are lower socioeconomic status (Löve et al., 2012), low income, low educational level, higher age, being an immigrant, low self-rated health (Roelen et al., 2013), and previous long-term sick leave. A study in a Norwegian cohort showed that both psychosocial and mechanical factors contributed to neck pain, with the main factors being repetitive work, scarce possibilities for development, low work control, lack of leadership, and lack of support from supervisor (Sterud and Johanesen, 2014). Neck pain is disabling for the individual; it affects their daily activities and surroundings, and sometimes leads to long-term sick leave (Cote et al., 2008). The problem is multifaceted, and involves physical (Ariens et al., 2000) and psychological factors (Linton, 2000). This indicates that no single risk factor is enough to cause neck pain by itself; the situation is affected by both individual actions and workplace demands (Cote et al., 2008).

There is a theory that tension in the neck and shoulder muscles, and hence a lack of rest, is a risk factor for chronic pain. If so, then an intervention that is able to modify muscle activity pattern could improve health by reducing pain, and thus improve work ability. Intensive muscle strength training and relaxation exercise with myofeedback training are two therapies used to treat non-specific neck pain, with potential improvements in muscular function. The theoretical basis for this is the report in a prospective study by Veiersted (1993) (Veiersted and Westgaard), which showed an association between pain in the neck-shoulder area and a reduction in myoelectric rest periods in the trapezius muscle among female factory workers. Those women who lacked short rests in the myoelectric activity from the trapezius muscle therefore had an increased risk of developing neck pain. Female employees with neck pain have been shown to have a lesser amount of muscle rest during work time (Sandsjö et al., 2000, Hägg and Åström, 1997). Prospective results from another study show that perception of muscle tension is a strong risk factor for developing neck pain among computer users (Wahlström et al., 2004). Muscle activation pattern is thus confirmed as being of importance for developing neck-shoulder pain. Strength training of neck muscles in a RCT reduced perceived exertion during work among female industrial workers with neck pain (Hagberg et al., 2000). According to a Cochrane evaluation, physical training has the effect of increasing work ability in patients with chronic neck pain (Schonstein et al., 2003).

1.2.3 The Swedish sickness insurance system

The results from incidence and prevalence studies of sick leave can vary between countries due to variations in sickness insurance systems. In Sweden, the employer is responsible for the rehabilitation process in regard to RTW and trying to adapt work to the worker in order to enable the individual to return to work. Before 2008 the length of sickness coverage was almost unlimited, but now it is

limited to one year except for certain diagnoses. Individuals who live or work in Sweden are covered by social insurance, which includes income replacement. The welfare system is comprehensive and inclusive. The sickness insurance system covers the entire working population, and works on the principle of providing compensation through sickness benefits when a worker has decreased work ability due to disease/disorder or injury. The idea of a public health insurance system is that the individual who is ill or injured will receive compensation for loss of income; hence it is not enough simply to have a disease, but one's work ability should also be reduced. There is current debate over what disease actually is — is being tired or exhausted enough to meet the criteria for sickness benefit? The crucial aspect is the extent to which the disease affects the individual's work functioning (Vahlne Westerhäll et al., 2009). According to Swedish law, sickness benefits will be issued if the individual's working degree is reduced by at least 25% (Law 1962:381, General Provisions on Sickness and Activity Compensation), (Law 1991:1047, About Sickness Compensation). Sick leave will be paid by the employer for the first two weeks, excluding the first day. If an employee is sick for more than 14 days, the employer will notify the Social Insurance Agency, which assesses whether the worker is entitled to sickness benefit. In order to prove the reduction of work due to illness, the worker must produce a medical certificate from the 8th day of their sick leave period at the latest.

As mentioned above, work ability needs to have decreased by at least 25% for the individual to be covered; it is possible to receive sickness benefits covering 25%, 50%, 75%, or 100% of the working degree. Since 2008 the sickness insurance system has been limited to one year, and Swedish law states that it should not discriminate between work-related and non-work-related conditions (1976:380, Occupational Injury Insurance). In 2008, a time schedule for work ability assessments was introduced to the sickness insurance system. The worker initially reports their sickness to their employer. The first day of sick leave is not covered, but aside from this the employer provides sick pay for the first two weeks. After seven days, a medical certificate is required. After two weeks, the Social Insurance Agency will assess the person's work ability to determine whether they are eligible for sickness benefits. The Social Insurance Agency's assessment of work ability depends on how long the individual has been off work. During the first 90 days, work ability is assessed in relation to the individual's present work. From this point up to 6 months, it is assessed in relation to other available work tasks with the same employer, and the individual remains entitled to continued sickness benefit if the employer cannot adapt the work or relocate the individual within the workplace. After 6 months, work ability is assessed in relation to any work on the labor market. If the Social Insurance Agency determines that there is work available that the individual is capable of performing, the person is passed

on to the Employment Agency. After one year, sickness benefits will no longer be granted except for cases of severe illness. Individuals who have a very serious illness may apply for continued sickness benefit. Examples of such diseases are some tumor diseases, severe neurological diseases, or awaiting transplantation of a vital organ. There is no time limit on how long continued sickness benefit can be paid. If a person's work ability is assessed as decreased for life, a disability pension may be granted.

Central stakeholders involved in the rehabilitation process for an individual to RTW in the Swedish context are the individual themselves, their employer, the health care system, the Social Insurance Agency, and the Employment Agency; all these parties are included in the present thesis. However, a Swedish study found that interaction with and between stakeholders is rare, and takes place too late in the rehabilitation process (Nilsing et al., 2013, Ståhl et al., 2009).

1.3 Return to work from long-term sick leave

Rehabilitation means reintegration; it is a concept with a positive meaning. The term covers measures of a medical, psychological, social and work-oriented nature aimed at facilitating and supporting the individual to regain and increase their work ability (Vahlne Westerhäll et al., 2009). It is crucial to have an effective RTW process, as persistent long-term sick leave is a critical social problem which affects individual well-being and finances. These problems are especially acknowledged among women working within HSOs (Pransky et al., 2005). The primary purpose of the rehabilitation process is to improve the individual's quality of life and their possibilities to act as an independent individual within society, through maintaining their ability to work and eventually returning to work. According to Swedish law, individuals should have the opportunity for rehabilitation activities and the right to compensation. RTW from long-term sick leave is recognized as particularly complex. There are great challenges in handling and assessing work ability and the RTW process among people on long-term sick leave. There is a high prevalence of long-lasting sick leave among women with musculoskeletal pain in the neck, and their rehabilitation activity is low. This emphasizes the importance of developing intervention methods that are easily used and that will increase work ability and RTW. In addition, occupational health care providers need effective, usable, valid, and reliable instruments to measure work ability status, progress, and prognosis (Alexanderson and Norlund, 2004, Slebus et al., 2007), in order to be able to increase work ability and facilitate a sustainable RTW (Ekbladh, 2008).

Previous studies have shown that RTW is influenced by individual, activity-related, and environmental factors. The individual factors include the person's

own belief in their ability to work in the future (Astvik et al., 2006:3, Elfering, 2006, Hansen et al., 2005, Hansen et al., 2006, Hansen Falkdal, 2005), a high sense of coherence (Melin et al., 2003), a relatively high educational level (Melin et al., 2003), a somatic disorder (Hansen et al., 2006), a clear diagnosis (Astvik et al., 2006:3, Falkdal et al., 2006), fewer self-reported symptoms (Hansen et al., 2005), the individual's involvement and engagement in the work task (Holmgren, 2008), life satisfaction (Hansen et al., 2006), and comorbidity (Johansson, 2007). Activity-related factors are activity balance (Falkdal et al., 2006), meaningful work tasks (Gard and Sandberg, 1998), and meaningful activities outside work. Other important aspects include the involvement of individuals themselves (Gerner, 2005, Landstad et al., 2009b), and social support at work and outside work from friends, relatives, and professionals (Astvik et al., 2006:3, Falkdal et al., 2006, Holmgren and Dahlin Ivanoff, 2004, Jansson and Bjorklund, 2007). Some studies have found that the amount and type of rehabilitation activities are dependent upon age, sex, education, and area of residence (Airila et al., 2012, Vahlen Westerhäll, 2008). Early assessment of the individual's resources, strengths, and hindrances is essential in order to increase the success in RTW (Hansen Falkdal, 2005); the timing of the intervention is also crucial (Elfering, 2006, Johansson and Isaksson, 2011).

Being on long-term sick leave is in itself a variable for not returning to work (Borg et al., 2001); within this group we generally often only see small progress in improving work ability and working degree. In comparison to men, women show a higher prevalence of long-term sick leave and persistent work disability (Dellve et al., 2006, Leijon et al., 2004, Riksförsäkringsverket, 2006). This is particularly the case in human service work, which is still a very sex-segregated sector. It is of great importance to explore work ability factors and rehabilitation measures which could predict, enable, and make the RTW process more effective and lasting for individuals on long-term sick leave. However, studies have revealed that in many cases workplace rehabilitation is not used to a sufficient extent, and rehabilitation measures commence too late (Stattin, 2005). Knowledge is limited regarding the effect of rehabilitation (Vingård et al., 2007, SoU, 2006:107, Loisel et al., 1994), and for whom and when it works.

1.3.1 The process of returning to work

The goal of the rehabilitation process and the task facing the stakeholders is to enable the individual to perform work, rather than to improve the individual's basic functions or disabilities. Thus it is essential that the rehabilitation process focuses on factors that are modifiable and reversible in the individual. For a good rehabilitation process and an improvement of work ability, the involvement and participation of the workplace (Kuoppala and Lamminpaa, 2008, Kuoppala et al.,

2008, Williams et al., 2007), work accommodations, and interaction between stakeholders are important (Franche et al., 2005). In Sweden, the employer is responsible for rehabilitating and adapting work to the individual, to enable RTW. The employer ought to organize work adjustment and rehabilitation activities in a suitable manner. Rehabilitation efforts should be implemented in collaboration with the individual and the individual's work (Sandqvist and Henriksson, 2004).

When attempting to optimize the rehabilitation process, it is important to assess the individual's performance and work ability. However, as Ståhl et al. have argued (Ståhl et al., 2010), today's stakeholders lack the competence to assess work ability, and there is a lack of collaboration between the workplace and health care.

The context of the systems supporting individuals' RTW incorporates the workplace system, the social security system, the health care system, and the personal system (resources and coping mechanisms). This context is presented in Figure 3 in terms of the Sherbrooke model (Loisel et al., 2005). This thesis views the system from the perspective of the individual with a disability. It is important to adapt and modify the model according to the local context within which the individual is work-disabled. The model has been adapted for the Swedish societal context by Wåhlin (Wåhlin, 2012). Legislative and insurance systems differ throughout the world, and Sweden has its own specific system which involves the social security system, the Social Insurance Agency, and the Employment Agency. According to Swedish laws and regulations, these actors should focus on the individual's work ability and employability (Loisel et al., 2005, Ståhl et al., 2011). There are great demands on stakeholders within the different systems, in terms of knowledge and cooperation skills, both of which are factors that enable work ability and RTW. The routines and regulations within each system are often in conflict with each other, with the implication that the individuals are often pushed and pulled in contradictory directions.

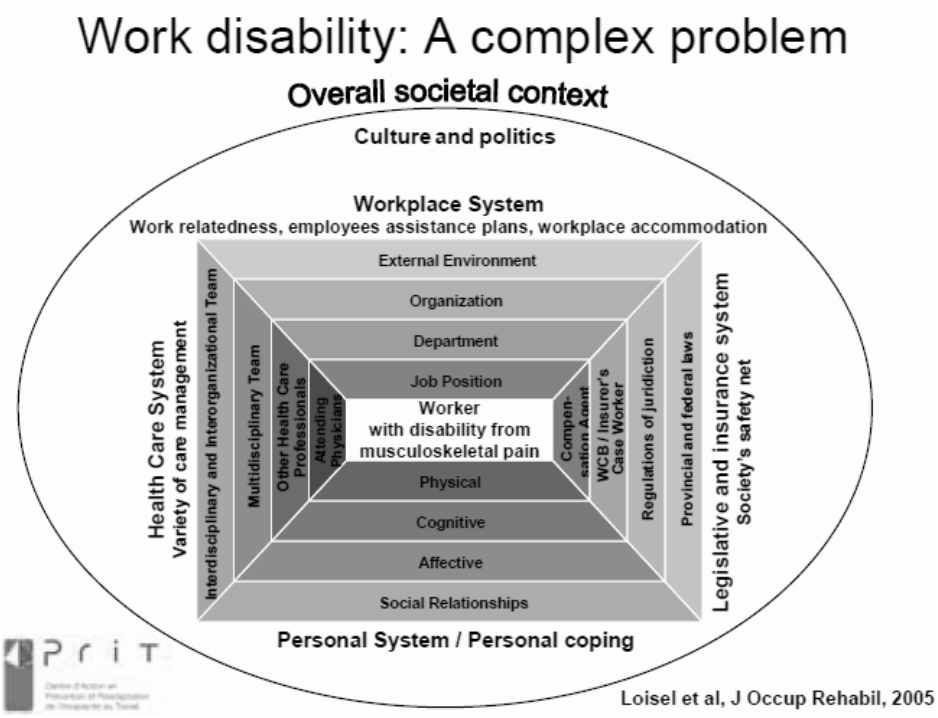

Figure 3. The Sheerbroke model, "Work disability: A complex problem" or the Arena of Work Disability (Loisel, et al, 2005).

Among the various different therapies and treatments within the rehabilitation process, it has been difficult to state which one is most effective, and for whom. As already mentioned, the involvement and participation of the workplace is an essential factor (Kuoppala and Lamminpaa, 2008). Rehabilitation in the workplace may include work training, assessment of capacity, and person-supportive actions, as well as physical and psychosocial changes in the work environment, organization, work tasks, working hours, and distribution of work. Studies have shown the importance of accommodation at work for decreasing sick leave among both women and men (Hultin et al., 2010), for enhancing RTW (Johansson et al., 2006), and for staying at work (de Vries et al., 2011). The duration of work disability has also been shown to be decreased by work accommodation and the interaction between workplace and health care (Franche et al., 2005). Workplaces in which skills and knowledge about the concepts of work ability and RTW are incorporated into the organization more often result in sustainable RTW for individuals (Dekkers-Sanchez et al., 2011).

A combination of rehabilitation measures within a multidisciplinary team has been highlighted as the most successful strategy for RTW (Falkdal et al., 2006, Holmgren and Dahlin Ivanoff, 2004, Klanghed et al., 2004) in structured back-to-work programs (Nordqvist et al., 2003) with clear goals and milestones (Gard and Soderberg, 2004). Research and practice regarding the rehabilitation process, as well as secondary prevention and health promotion, are seldom integrated at the workplace and within the health care system. Individuals on long-term sick leave need guidance, feedback, directions, and supportive leadership during their RTW, and there is a need to have someone in charge of this process, leading the collaboration with stakeholders. Shaw et al. (2007) suggested the role of a RTW coordinator for a safer and more sustainable RTW with a focus on the individual. Six domains of focus and required competence for the RTW coordinator were identified: ergonomic and workplace assessment, clinical interviewing, social problem solving, workplace mediation, knowledge of the business and legal aspects of disability, and knowledge of medical conditions (Shaw et al., 2008, Franche et al., 2005). Shaw et al. (2007) concluded in their review that RTW seems to depend more on competencies in ergonomic job accommodation, communication, and conflict resolution than on medical training/treatment (Shaw et al., 2008). Stahl et al. emphasized the importance of a well-trained and educated team to plan and coordinate RTW (Stahl et al., 2009); the continuity and quality of guideline based care are also important (Cornelius et al., 2010). Researchers have also hypothesized competences within the areas of worksite communication and conflict resolution, as well as competences on how to foster interpersonal relationships and communication throughout a complex process which involves everyone concerned in the rehabilitation process (Pransky et al., 2010). Individuals returning to work from long-term sick leave are often sensitive to their colleagues' attitudes and supportiveness during this time, and they do not want to be a burden on their colleagues. A recent report from the 2005 European Working Conditions Survey found that bullying was a risk factor for long-term sick leave (Niedhammer et al., 2013). It is important to get deeper knowledge about which rehabilitation measures and supportive conditions facilitate RTW and increase work ability for individuals on long-term sick leave with neck pain, as well as ways of assessing and evaluating these outcomes.

1.4 Summary

There are a great many women on long-term sick leave from HSOs in Sweden. Many of these women suffer from chronic neck pain, but do not express these symptoms and do not seek support for them. There is a desire in Swedish society to focus on reducing the numbers of individuals on sick leave, but so far the problem remains unsolved. One of the problems is that there is no clear consensus on the concept of work ability, nor on how to assess and evaluate work ability and

RTW. There is also no set standard for factors and interventions contributing to increased work ability and RTW. Individuals and stakeholders are often driving in different directions, and failing to achieve the goal of increased work ability and RTW. There is still a lot to be done from the perspectives of stakeholders and society when it comes to improving work ability and RTW for women on long-term sick leave from HSOs, particularly those with neck pain.

2 AIM

The overall aim of this thesis was to gain new knowledge of the factors and intervention that improve work ability and return to work among women on long-term sick leave from human service organizations.

The specific aims of the individual studies (Papers I-IV) were:

To evaluate the association between self-rated work ability (WAI and WAS), and the relationship with prospective sick leave, symptoms, and health among female HSO workers on long-term sick leave (Paper I).

To investigate whether intervention with myofeedback training or intensive muscular strength training can decrease pain and increase work ability among women on long-term sick leave with neck pain (Paper II).

To examine associations between workplace rehabilitation, with a special focus on the combination of supportive conditions at work, and work ability and RTW over time, among women on long-term sick leave (Paper III).

To explore experiences, views, and strategies in rehabilitation for RTW among women with neck pain on long-term sick leave (Paper IV).

3 METHODS AND MATERIAL

This thesis is based on four studies (Papers I-IV) among a cohort of women on long-term sick leave from HSOs.

3.1 Study population, design, interventions, and assessments

The cohort started in 2005, and consisted of women who at baseline had been on long-term sick leave for more than 60 days and for at least half-time, and were working within a HSO in a major Swedish municipality. Papers I and III were based on participants from the full cohort. The participants in Paper II (the randomized controlled study) comprised a subpopulation of participants with neck pain, all recruited from the cohort. Finally, all but one of the participants in Paper IV were recruited from the cohort. For an overview, see the participant flowchart in Figure 4 and the summary of the study designs and methods in Table 1.

Table 1. Summary of the designs and methods of Papers I–IV.

	Paper I	Paper II	Paper III	Paper IV
Design	Cohort, longitudinal, quantitative	Randomized controlled trial, longitudinal, quantitative	Cohort, longitudinal, quantitative	Cohort, longitudinal, qualitative
Population	Women on long-term sick leave, from a HSO*	Women with neck pain on long-term sick leave from a HSO*	Women on long-term sick leave from a HSO*	Women with neck pain on long-term sick leave from a HSO*
Method of data collection	Questionnaire at baseline, 6 months, 1 year	Questionnaire at baseline, 1 month, 3 months; assessment and measurement of work ability; register-based data	Questionnaire at baseline, 6 months, 1 year; register-based data	Questionnaire at baseline, 6 months, 1 year, 5 years; interviews
Participants at baseline	n=324	Completed intervention n=60	n=324	n=260 questionnaires n=16 interviews

*Human Service Organization

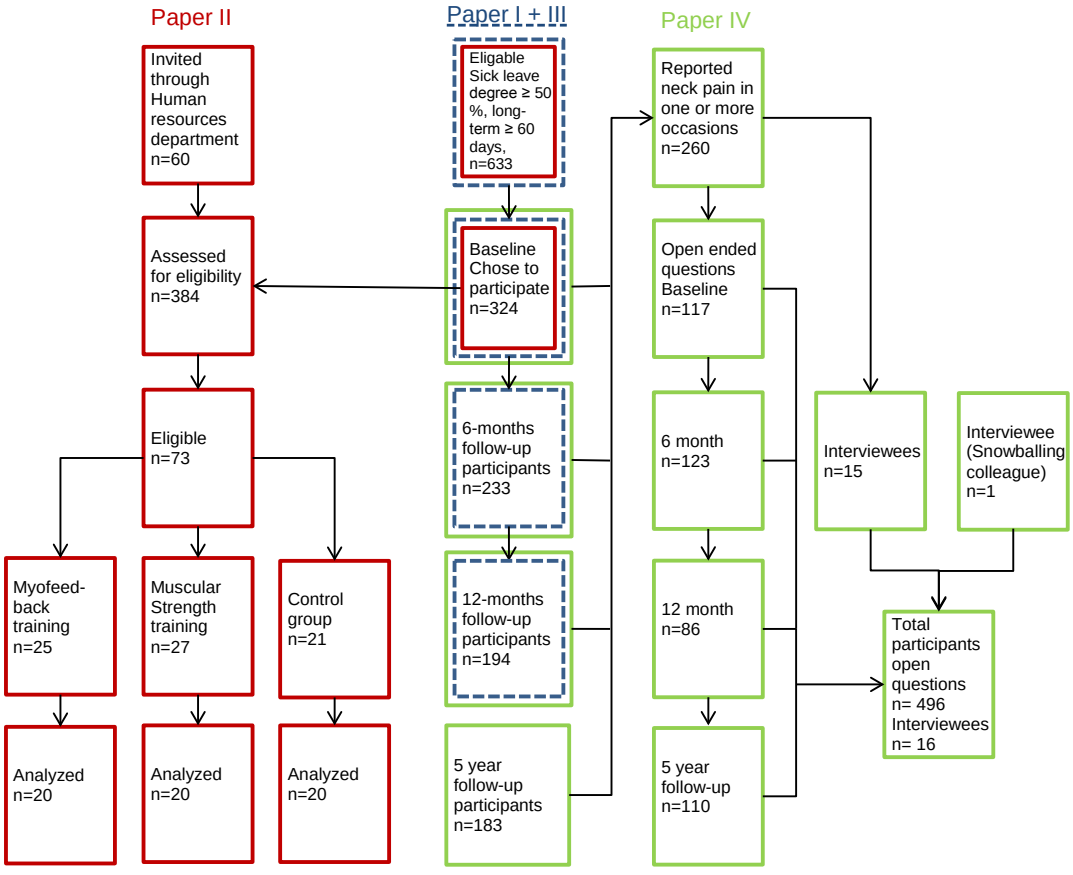

Figure 4. Flowchart of the participants in Papers I-IV.

The study populations and designs are described in detail below. Papers II and IV had additional inclusion and exclusion criteria, as these studies focused on women with neck pain.

3.1.1 Papers I and III

The study population for the cohort was a sample of 633 individuals, all on long-term sick leave and all employed within the municipality in a major Swedish city. At the start of the cohort, all participants had been on long-term sick leave for at least 60 days and for a degree of at least 50%. At that time, the social security system provided paid sick leave of almost unlimited length (Kausto et al., 2008).

Information about participants who fulfilled the inclusion criteria was obtained from the human resource departments at the different local offices within the municipality in two different ways: (a) they prepared envelopes addressed to the individuals; (b) they provided a list of the individuals. In case "one", we sent a letter with written information about the study and an invitation to participate; those who agreed to participate then provided their addresses and were sent the questionnaire. It was not possible to send reminders in the first wave in this case. Half of the participants (case "two") received the questionnaire together with the initial information, and were also sent a reminder after a couple of weeks. All individuals who chose to participate in the first wave received a follow-up questionnaire after 6 and 12 months. The baseline questionnaire response rate was 51% (n=324), and this did not differ between individuals invited in case "one" and those invited in case "two". A total of 233 individuals responded at the 6 month follow-up and 194 responded at the 12 month follow-up. At both follow-up occasions, non-respondents were sent two reminders with the questionnaire included. This procedure resulted in 751 completed questionnaires to be analyzed. The reason for setting up the cohort was to enable recruitment to the intervention study (Paper II).

One-third (28%) of the participants were 35–44 years old, 43% were 45–54 years old, and 29% were 55–65 years old. At baseline, most (72%) of the participants were on full-time sick leave. All individuals were on long-term sick leave (≥50% sick leave degree) when recruited, but a few of the individuals had started to work before they received the questionnaire. We decided to keep these individuals within the cohort, reflecting the fact that people in this situation may fluctuate in working degree. At the start of the study, the shortest time that a participant had been on long-term sick leave was just over 60 days and the longest time was 14 years, with a mean of 458 days.

3.1.2 Paper II

A randomized controlled study (RCT) was set up in order to test and evaluate alternative treatments/interventions over time (Campbell and Machin, 1993). The effects of two different approaches were tested, with a focus on neck pain and RTW. The interventions were of two different types, and so participants were divided into three groups: the intensive muscular strength training group, the myofeedback training group, and a control group. The sample in Paper II was derived from the cohort of 324 participants, using the inclusion criteria of neck pain for at least one year and sick leave mainly due to neck pain. A further 60 individuals were recruited through human resources. After applying the exclusion criteria, detailed below, and excluding those who declined participation, the final sample consisted of 73 individuals eligible for participation. The inclusion criteria

mandated that the reduction in work ability should be caused mainly by either cervicobrachial pain syndrome (ICD 10-code M53.1) or cervical pain syndrome (ICD 10-code M54.2), as judged by the treating physician. These two syndromes cover non-specific pain in the neck and/or shoulder area. There was no exclusion due to ongoing rehabilitation measures or use of pain relief. The exclusion criteria were as follows: conforming to the criteria for primary fibromyalgia, systemic inflammatory diseases, malignant and progressive diseases, neurological diseases, psychosis, non-medically treated depression, and diseases that do not allow hard physical training, and being unable to understand instructions for intervention and questions formulated in Swedish. In order to reach the required statistical power, twenty participants in each group were needed to complete the baseline, one-month, and three-month follow-ups; 27 participants started in the intensive muscular strength training group, 25 in the myofeedback training group, and 21 in the control group. A total of 60 participants completed the project, with the others dropping out due to lacking motivation or energy (n=5), being advised by their doctor not to participate (n=2), choosing to cease participation due to hassle with the myofeedback training equipment (n=4), lack of time due to having started working full-time (n=1), and family reasons (n=1). Among the responders in the cohort, 54% (n=175) had chronic pain in the neck region, defined as a score of ≥ 3 on the von Korff Pain Index (Von Korff et al., 1992). Half of the cohort (48%, n=154) reported that they had a diagnosed musculoskeletal disorder. Individuals meeting the inclusion criteria who had also indicated an interest in participating in the RCT (through a question in the questionnaire) were contacted by phone by the research nurse. They were then given information about the study and were interviewed about contra-indications for participation in the interventions. Those who decided to take part in the study were given an appointment for a baseline assessment at the occupational medicine clinic at Sahlgrenska University Hospital, and were mailed written information about the study along with an invitation to participate. A reminder was sent via text message the day before the assessment at the clinic. Each individual was reimbursed with 760 Swedish crowns (before tax) at each meeting, to cover travelling expenses and loss of income.

Most of the women were 45–54 years old. Women working in physically demanding jobs were equally distributed among the intervention groups and the control group. Most participants (n=50, 80%) were classified as having poor work ability, while the rest had moderate work ability. At baseline, most participants rated high pain in the neck region and poor health. About 70% of the participants in the myofeedback group and about 50% of those in the intensive strength training and control groups had a mental disorder comorbidity (self-rated, but diagnosed by a physician). The mean working degree at baseline was 15% in the intervention groups and 13% among the controls. Almost all of the women had

had rehabilitation activities such as medical treatments, physiotherapy, and exercises. About half of the women had had contact with a psychologist, and one third had been in contact with complementary medicine (acupuncture, chiropractic, and/or naprapathy). Only about 20% had had internal occupational rehabilitation at their own workplace and even fewer (10%) had had external occupational rehabilitation. Rehabilitation activities were controlled for, and were equally distributed between the intervention groups.

When participants arrived at the clinic, the research nurses again gave them detailed information about the study, the interventions, and the kind of measurements to be carried out at baseline and follow-up visits. Time was allowed for the participants to ask questions and get more information on any aspect of the study. If the individual chose to participate, they and the research nurse signed a written informed consent form. To ensure that they fulfilled the inclusion criteria and would not be put at any risk by taking part in the assessments and interventions, each participant either provided a certificate and medical record from their treating physician, or underwent a medical assessment by a physician from the clinic.

The assessment started with the research nurses asking questions about general health and any medicine use relevant to the tests to be carried out, and registration of blood pressure, weight, height, waist and hip measurements, and handedness. Preparations were made for EMG recording, with bipolar surface electromyography (sEMG) being collected bilaterally from the descending part of the upper trapezius muscle; two electrodes were placed lateral of the midpoint of the line connecting vertebra C7 and the acromion (Mathiassen et al., 1995). The muscle activity level was recorded during the whole 3–4 hour session. The tests used to observe work ability were the Purdue Pegboard® (dexterity/gross movements), the Triangle test (3T) (gross movements of hands/arms), the Stroop color-word test (stress-related muscle activity of the neck), the cutlery wiping performance test (Ahlstrand et al., 2009) (muscle activity in the arms/neck), grip strength measured using the Jamar® dynamometer (hand muscles), and a bike-riding condition test including measuring the individual's heart rate recovery. After finishing the functional tests, each participant filled in the questionnaire and was offered refreshments. Further details of the tests used in Paper II are given in Section 3.2.1 (Variables).

After baseline assessment, each participant was randomized into one of three groups: two intervention groups (muscular strength training and myofeedback) and one control group. Randomization took place with the help of a blindfolded staff member who drew lots from blocks of lotteries in a box. Individuals randomized into interventions were contacted by an ergonomist within 2-3 days.

Both interventions were led by the same ergonomist (an experienced ergonomist and registered physiotherapist), lasted for four weeks, and were typically set at the participant's own home.

Participants in all three groups kept a diary for six days a week during the intervention period where they registered activities, discomfort, pain, sleeping disturbances, and other information that was important and relevant from their own perspective (i.e. things of potential relevance to, impact on, and influence on their neck pain).

The *intensive muscle strength training* usually took place at home, but could take place wherever the individual felt comfortable doing it. Each participant was instructed by the ergonomist to perform the exercises twice a day on six days a week for four weeks. The exercises included training with dumbbells and resistive exercise system latex bands (Thera-Bands®; see Figure 5), and used the concept of ten contractions at 75-100% of maximum muscle capacity. The exercises targeted the neck muscles, shoulder muscles, forearm muscles, and back muscles. The training program took about 10 minutes to perform, and was described in detail in a booklet provided to the participants (Lindegård and Grundell, 2005). The program began with two warm-up movements, followed by four exercises to strengthen and coordinate the upper extremities, and ended with two exercises focusing on breathing and slowing down one's movements. Each set of movements was repeated three times. In order to keep the participants motivated to follow the training schedule, the ergonomist visited each participant's home at the start of the training period to repeat the instructions and to support, evaluate, and discuss the training program, activities, and pain pattern. The ergonomist used the diary to support this discussion, and followed up with phone calls twice a week.

The group that received *myofeedback training* used a harness that registered the muscle activity from the trapezius muscle (Figure 6). A control unit that continuously evaluated the recorded activity was connected to the harness (Hermens and Hutten, 2002, Reyes-Ortega et al., 1997). The harness gave feedback by vibration or sound to the individual when there was not enough rest time (i.e. short pauses in muscle activity) in the trapezius muscle. The intervention continued for a four week period with the myofeedback harness used for at least two hours a day on four days a week during various activities. The harness equipment was used at work, at home, and at any other place chosen by the participant. The system was fully self-administered, and did not require the participants to perform calibration. By means of the harness, the built-in dry electrodes were repositioned over the same part of the trapezius muscle each time the system was used. Once started, the control unit continuously evaluated the

myoelectric signal and produced a vibration when the amount of relative rest time was too low in the monitored part of the muscle. Apart from providing alarms to the user in situations of insufficient muscle rest, the system also stored the muscle activity patterns. The therapist visited each participant once a week (typically in their own home) to discuss the previous week's recordings of muscle activity patterns in relation to activities noted in the diary, in order to identify specific work tasks and activities of concern. The discussions were focused on these situations or sequences with the specific aim of coming up with possible alternative ways to handle situations with unfavorable muscle activity patterns. These weekly dialogues were a crucial part of the intervention, as they increased the benefit of the system by helping the user to discern between favorable and unfavorable working practice.

Figure 5. The Lion training exercise, part of the intervention for individuals doing intensive muscle strength training.

Figure 6. Individual in the myofeedback training group wearing a harness with electrodes over the trapezius muscle in the straps. The EMG logger and feedback device is carried in a small pouch/bag.

The myofeedback training and the intensive muscle strength training were evaluated by comparing follow-up at the end of the four weeks of intervention and after three months from the start of the intervention. The variables for the evaluation at the follow-up assessments were the same as for the baseline measure, and were measured by the same research nurse. The final study group consisted of 60 women (20 in each subgroup) who had completed the interventions and follow-up measures.

3.1.3 Paper IV

A qualitative longitudinal design was used for Paper IV. At the start of the study, a five-year follow-up of the cohort was conducted and used as the basis for recruiting interviewees. The answers from the open-ended questions were also included in the analysis. The inclusion criterion for Paper IV was having reported neck pain according to the von Korff Pain Index (≥3) on any occasion; 260 individuals met this criterion. The open-ended questions were answered 496 times in total, by 177 participants at baseline, 123 at 6 months, 86 at 12 months, and 110 at 5 years.

A total of 17 individuals were approached; one declined participation due to lack of time, leaving 16 women to be interviewed. While efforts were made to enroll a diverse sample of women on long-term sick leave, not all age groups were covered, and so snowball recruitment was used. The mean age at study start was 49 years among the full cohort and 54 years among the interviewees. The average neck pain score on Von Korff's Pain Index (Von Korff et al., 1992) was 5 (SD: 3, range: 0–10) (Table 2).

The in-depth interviews took place in 2013, and focused on the interviewees' views on the strategies used in the rehabilitation process. Previous reports have stated that the decisive factors for individuals in the rehabilitation process are commitment and participation from the workplace, where rehabilitation may include job training, assessment of function and ability to work, supportive measures, and physical and psychosocial changes in the work environment, organization, tasks, working hours, and type of work. Thus, the grounded theory perspective was chosen, since the methodological approach allows analyses of central conditions at the micro, meso, and macro levels (Yurdusev, 1993, Dopfer et al., 2004). Researchers claim that involvement of the individual in the rehabilitation process leads to more effective treatment and rehabilitation, and increased patient satisfaction. It is therefore important to explore different aspects in the development of methods to better support the integration and involvement of the individual in the rehabilitation process.

Table 2. Descriptive data on the cohort participants at baseline and the interviewees in 2013 (Paper IV).

	Cohort participants	
	Baseline data, 2006	Interviewees, 2013
	n=260	n=16
	Mean (SD)	Mean (SD)
Age	49 (7)	54 (10)
Working degree (0-100) %	20 (35)	60 (45)
Work Ability Score (0-19), category	4 (3), poor	6 (3), moderate
Health (0-4), category	1 (1), fair	2 (1), good
Neck pain (0-10)	5 (3)	5 (3)

3.2 Data collection

The data collection consisted of questionnaires, laboratory-observed data, register-based data, and interviews.

3.2.1 Variables

The questionnaire data used for Papers I and II at baseline, 6 months, and 12 months consisted of the same dependent and independent variables. The full questionnaire comprised instruments, indexes, and items covering aspects of working, rehabilitation, health, symptoms, and sick leave status as well as open-ended questions about the participants' views of rehabilitation and return to work. Thus, the RTW factors were self-reported, and hence reflected the individuals' own perception. Individuals participating in the RCT also answered a questionnaire covering aspects of working, rehabilitation, health, symptoms, and sick leave status at baseline, one month, and three months. The measurements used in Papers I-IV are presented in Table 3.

Table 3. Measurements used in Papers I-IV. Dependent and independent variables: self-reported, register-based, and laboratory observed.

	Variable	Instrument*	Range**	Explanation	Paper(s)
Self-reported	Age		30-65		I, II, III, IIII
	Type of work				II, III

	Diagnosis/ disorder	One dimension in the Work Ability Index (WAI)		Additional comorbidity: musculoskeletal and mental health.	II, III
	Work Ability Index (WAI)	The full WAI	7-49		I, II, III
	Work Ability Score (WAS)	Single item from the WAI	0-10	From completely unable to work to work ability at its best. Concept used in Papers I & II with the phrasing “single item on work ability”.	I, II, III
	Changes in work ability	Changes in WAI/WAS		Difference between one point in time and previous point in time.	I, II
	Pain	Von Korff’s numeric pain scale	0-10	Average pain previous month. Different regions: neck and arms/hands/fingers.	I, II, IIII
	Current stress	Nordic Questionnaire for Psychological and Social Factors at Work	0-4, None at all – very much		I
	Self-rated general health	Copenhagen Psychosocial Questionnaire (COPSOQ)	0-100	5 items	I
	Self-rated mental health	COPSOQ	0-100	5 items	I, II
	Behavioral stress	COPSOQ	0-100	5 items	I
	Vitality	COPSOQ	0-100	4 items	I, II
	Quantitative demands	COPSOQ	0-100	3 items	III
	Emotional demands	COPSOQ	0-100	3 items	III
	Influence at work	COPSOQ	0-100	3 items	III

	Possibilities for development	COPSOQ	0-100	2 items	III
	Degree of freedom at work	COPSOQ	0-100	1 item	III
	Meaning of work	COPSOQ	0-100	1 item	III
	Quality of leadership	COPSOQ	0-100	4 items	III
	Social support	COPSOQ	0-100	2 items	III
	Sense of community	COPSOQ	0-100	2 items	III
	Work satisfaction	COPSOQ	0-100	4 items	III
	Sense of feeling welcome back at work	Single item	-	Yes fully, yes partly, and no	III
	Health-related Quality of life	EQ-VAS	0-100	Single item from EQ-5D	I
	Rehabilitation measures	Classified into 8 categories.	-	Took part or not (yes/no) in the activity	III
Register-based	Sick leave degree		0-100	Register-based in 2/3 of cases, self-reported in 1/3.	I
	Working degree		0-100	Register-based in 2/3 of cases, self-reported in 1/3.	II, III, IIII
Laboratory observed	Work ability	Cutlery wiping performance test	0-	Pieces of cutlery wiped/minute.	II
	Work ability	Dexterity/gross movements	0-	Purdue Pegboard, nr of pegs placed in a row within 30 seconds. Movements of hands, fingers and arms in combination.	II
	Work ability	Grip strength	0-	Dominant hand, average of three attempts.	II

*Not all variables have range.

**References for the instruments are not presented in this table.

Self-rated work ability

The ***Work Ability Index*** consists of seven dimensions: current work ability compared with the lifetime best, work ability in relation to the demands of the job, number of current diseases diagnosed by a physician, estimated work impairment due to disease, sick leave during the past 12 months, own prognosis of work ability two years from now, and mental resources (the worker's life in general, both at work and during leisure time) (Ilmarinen, 2009). These dimensions are derived as the sum of ten items. Possible scores range from 7 to 49 and are classified as follows: poor (7–27), moderate (28–36), good (37–43), and excellent (44–49) (Tuomi et al., 1998, Sjogren-Ronka et al., 2002, Ilmarinen, 2007).

In this thesis, the ***Work Ability Score*** (single-item question) concerned the WAI item for current work ability compared with the lifetime best, with a possible score from 0 ("completely unable to work") to 10 ("work ability at its best") (Ilmarinen, 2009, de Croon et al., 2005). The classification for WAS is poor (0-5), moderate (6-7), good (8-9), and excellent (10) (Gould et al., 2008). The higher the score, the better the individual's work ability. The validity of and similarity between WAI and WAS have recently been proved in large populations (El Fassi et al., 2013, Roelen et al., 2014)

Change in WAI or WAS was defined as the difference between one time point and the previous time point; that is, the difference between the 6-month score and baseline, or the difference between the 12-month and the 6-month value. Hence, changes represent a 6-month time period. The Work Ability Index was calculated according to the manual (Tuomi et al., 1998). In this thesis, item 2 (work ability in relation to the demands of the job) was weighted according to the nature of the work. The full WAI was no longer in the questionnaire at the five-year follow-up, and so work ability in Paper IV is presented using WAS.

Working degree/sick leave degree

We used ***working degree*** (Papers II-IV) and ***sick leave degree*** (Paper I) as an indication of return to work. These two indicators add up to 100% for individuals in full-time employment, but this is not the case for those in part-time employment. Working degree and sick leave degree could range from 0-100%, and were based on the response to one item in the questionnaire: "What is your current work status?" The possible responses were: (i) on full-time/part-time sick leave, (ii) on full-time/part-time temporary disability pension, and (iii) working full-time/part-time. The response specified the percentage of each status and the starting date of the current status. The classification of working degree (Paper III) was made according to the Swedish Central Bureau of Statistics (SCB): 100-86%, 85-51%, 50-26%, and <26%. In order to check the validity of the self-reported

data, these data were compared with employers' register-based data and medical records where possible (i.e. in two-thirds of the cases). We found no important discrepancies, and these records also helped to add missing data. A literature review by Hensing et al. showed that self-reported data were comparable with employers' register-based data or medical records (Hensing et al., 1998).

Symptoms and health

Neck pain was measured using items from an instrument developed by Von Korff et al. to grade the severity of pain (Von Korff et al., 1992, Von Korff and Miglioretti, 2005). This is a numeric pain scale ranging from 0 ("no pain") to 10 ("worst imaginable pain"), and measuring "present pain", "worst pain last month", and "average pain last month". In Paper II, the index was calculated as the average of these three measures multiplied by 10 and expressed as a score of 0–100. One question about average pain over the previous month was included for each area. Decreased pain was measured as the difference in points between times of measurement.

Current stress was measured with a single-item question (which included a description of what was meant by "too high stress") taken from the Nordic Questionnaire for Psychological and Social Factors at Work (QPS Nordic). This item has been validated in previous studies (Elo et al., 2003). Current stress was measured on a scale ranging from 0 ("not at all") to 4 ("very much"). A score of 3–4, indicating the highest stress levels, was used to indicate current stress in this study.

An index from the Copenhagen Psychosocial Questionnaire (COPSOQ), (Kristensen et al., 2005) was used to measure ***self-rated general health*** (5 items), ***self-rated mental health*** (5 items), ***behavioral stress*** (5 items), ***vitality*** (4 items), ***quantitative demands*** (3 items), ***emotional demands*** (3 items), ***influence at work*** (3 items), ***possibilities for development*** (2 items), ***degree of freedom at work*** (1 item), ***meaning of work*** (2 items), ***quality of leadership*** (4 items), ***social support*** (2 items), ***sense of community*** (2 items), and ***work satisfaction*** (4 items). Each item on this scale has 4, 5 or 6 graded responses which are then recalculated to an index of 0-100 points. When dichotomizing, a split at the neutral value (50 points) was used except for the variable "meaning of work". For this index, a median split (>75) was used due to skewed distribution of the data.

Health-related quality of life (HRQoL) was measured with the EuroQol thermometer (EQ-VAS). This is a global question which is part of the EuroQol-EQ-5D and uses a visual analog scale ranging from 0 to 100 to measure general HRQoL status (1990, Brooks et al., 1991, Rabin and de Charro, 2001).

The ***sense of feeling welcome back at work*** was measured with one item: "Do you feel that you were welcome back to work?" with response alternatives of "yes, fully", "yes, partly", and "no". A positive response to this item was defined as an answer of "yes, fully" (Lindberg et al., 2006a).

Rehabilitation measures were assessed by self-report (yes/no) of whether the individual participated in the activity (Vingard et al., 2005). Questions were classified into a number of categories: medical treatment (physician/hospital care), physiotherapy, self-directed physical exercise, courses/programs (back/neck school or psychologically/socially-focused rehabilitation, comprehensive rehabilitation program for four hours per day over a period of at least four days), socially/psychologically focused rehabilitation (psychologist/welfare officer), complementary medicine (acupuncture, chiropractic, and/or naprapathy), workplace rehabilitation (at the workplace, mainly including work training, assessment of work capacity, individually supportive actions, and physical and psychosocial changes in the work environment, organization, work tasks, working hours, and distribution of work), and offsite occupational rehabilitation (external to the workplace).

Laboratory-observed work ability

The ***Purdue Pegboard*** test involves inserting pegs into a vertical row of holes in a pegboard placed in front of the participant. Three tests were performed: (1) placing as many pegs as possible in the vertical row within 30 seconds using the dominant hand (Purdue dominant side; PD), (2) the same test with the non-dominant hand (Purdue non-dominant side; PN), and (3) the same test with both hands simultaneously (Purdue both sides; PB). In this study, the variable for PD was used (number of pegs/30 seconds). These tests were chosen as they include gross movements of hands and arms in combination with the precision demand of handling and positioning the pegs in the pegboard (Ahlstrand et al., 2012).

In the ***cutlery wiping performance test***, the participants were asked to wipe 60 pieces of wet cutlery. The cutlery was taken piece by piece from a basket on the dominant side, wiped, and then placed in a basket on the non-dominant side (Ahlstrand et al., 2009). Participants performed the test standing next to a table with a fixed (standard sink) height of 90 cm; they were not given any directions or instructions on the rate at which they should complete the task. The total time used to wipe all 60 pieces was recorded and expressed as number of cutlery pieces wiped per minute. This test was chosen to represent a familiar household task, enabling muscle activity to be studied without any obvious performance pressure or demand.

The ***grip strength*** measure included both grip strength and hand/finger strength. The aim was to measure the participants' grip strength using a dynamometer to measure the maximum grip strength. The instrument used was a Jamar Hydraulic Hand Dynamometer. Paper II used values from the dominant hand (which was the right hand for all participants), measured in kiloponds (kp) as the average of three attempts.

Open-ended questions and Interviews

Data were collected from the answers to open-ended ***questions*** in the cohort study and 16 in-depth ***interviews*** with participants recruited from the cohort. The open-ended questions were administered as part of a cohort questionnaire at baseline, 6 months, 12 months, and 5 years. The open-ended questions were concerned with facilitators for RTW, work adjustment, and experiences of sick leave and RTW.

Data from the in-depth interviews were collected using an interview guide which was modified during the procedure of interviewing. Interviews were intensive, shaped, beneath the surface of normal dialogue (Charmaz, 2006), and recorded. The following areas of questions were set: What are the interviewees' beliefs and suggestions about what could facilitate their RTW? What are their goals for rehabilitation and the RTW process? What are their beliefs about their collaboration with stakeholders? The researchers took field notes after each interview and wrote memos during the analytical process. Rigorous and appropriate qualitative research data collection methods with a grounded theory approach were used to conduct all interviews. In the grounded theory approach, concepts emerge from patient input, allowing the voice of the patient to be heard. Interviews were conducted face-to-face to confirm content validity, comprehensibility, relevance, and readability, and to ensure an appropriate recall period and fit between item stems and responses (Charmaz, 2006).

3.3 Quantitative analyses

Descriptive and analytic statistics were used in Papers I-III and qualitative analyses were performed in Paper IV. When data in Papers I-III were considered to be normally distributed, parametric statistics were used; otherwise, non-parametric statistical methods were applied.

The analyses in Papers I and II were performed using version 7 of the JMP® software package (SAS Institute Inc., Cary, NC, USA), except for the mixed models Proc Mix analysis, which was performed using version 9.1 of SAS (SAS Inc., Cary, NC, USA) (Incorporated, 2004). All statistical analyses in Paper II were performed using PROC MIXED in version 9.1 of SAS (Incorporated, 2004). The data in Paper III data were analyzed using version 9 of JMP® software

package and version 9.3 of SAS for the linear mixed models (SAS Institute Inc., Cary, NC, USA).

3.3.1 Paper I

Descriptive statistics for the studied variables were calculated as percentages (%), means (m), and standard deviations (SD). Spearman correlation was used for analyzing the association between the WAI and WAS, as well as for the association between WAI, WAS and sick leave, symptoms, and health. Correlations were categorized as follows: very strong (r=0.81–1.00), strong (r=0.61–0.80), moderate (r=0.41–0.60), fair (r=0.21–0.40), and weak (r≤0.20) (Altman, 1999). At an earlier stage of the analysis, the correlations were also analyzed using Pearson correlation, with very similar results. To describe the baseline relation between WAI and WAS outcomes, a scatter plot of baseline variables was completed. By plotting the data, an initial assessment regarding linear relationships was made in order to guide the decision of whether the use of correlation coefficients was an appropriate method. To summarize the relationship, an equation with slope and intercept was calculated. A scatter plot was also produced to assess the relation between changes in WAI and changes in WAS. Repeated measurements over time, multivariate models on the associations of sick leave, symptoms, and health with WAI and WAS outcomes were calculated. Multivariate analysis is an efficient tool for interpretation when evaluating data with large numbers of variables.

Mixed models were used for a longitudinal analysis of the repeated measurements of prospective dependent variables (i.e. sick leave degree, HRQoL, vitality, and neck pain), allowing us to follow development over time. In Paper I, these analyses were performed with four different models using WAI, changes in WAI, WAS, and changes in WAS as outcome variables. Mixed models were used to examine for the outcome variable and to determine factors affecting the outcome variable. In the two models the values for changes in WAI/WAS were based on the difference between the current outcome and that measured 6 months previously. In two other models, the values for changes in WAI/WAS were based on the difference between the current outcome and that measured 12 months previously. A stepwise forward selection approach was used with a p-value of ≤0.10 for the initial selection for variable inclusion in the final model. We checked for multicollinearity, and if the correlation (r) was >0.7 we excluded one of the variables. Multicollinearity was found between behavioral stress and self-rated mental health, and so the latter was excluded. Results from the regression analysis are presented with parameter estimates, 95% confidence intervals (95% CIs), and between-person/within-person variance. In these analyses, WAI and WAS were used as if they were continuous, and not ordinal, variables.

Consequently, these results ought to be interpreted with caution, and seen as indications of associations rather than emphasizing the size of parameter estimates. As the data consisted of repeated measurements from 324 participants, mixed models were used to account for this repeated sampling.

3.3.2 Paper II

Descriptive statistics were calculated at baseline for the entire study population participating in the RCT, as well as stratified for each intervention group. The change from baseline to first and second follow-up was compared between groups. The association between work ability and decreased pain between different occasions was also examined. Wilcoxon's signed rank test was used for non-normally distributed data, and Student's t-test for dependent observation was used for normally distributed data. Stratified analysis of participants with decreased pain was conducted to assess the change in work ability between baseline and first and second follow-up. All results with p-value <0.05 were considered statistically significant. Longitudinal analysis for repeated measurements with an unstructured covariance matrix was used to examine change over time for WAI items and neck pain (Fitzmaurice et al., 2004). Data for WAI items and neck pain were considered normally distributed.

The power calculation showed that there was 80% power to find a 30% change in gap frequency (muscle activation pattern) at a 5% significance level with 20 patients in each group. Rating of perceived exertion at work and at the performance tests would probably give a better power, since the expected effects of the intervention are large with a moderate variance. We expected the visual analogue scale rating of pain to give a low power due to its large variance. We also expected a low probability to detect difference in sick-leave frequency because of the great variance if the effects of the interventions were not extremely large.

3.3.3 Paper III

Descriptive statistics were calculated for all variables chosen for the study. Next, cross-sectional analyses with prevalence ratios (PR) were calculated with 95% confidence intervals to examine possible relationships between the explanatory factors and the outcomes. Participants with different length of sick leave, working degree, or level of work ability at different points in time were compared with their counterparts with regard to rehabilitation measures. Finally, a number of linear mixed models were used for longitudinal analysis of the repeated measurements of WAI, WAS, and working degree. The explanatory variables for each model were workplace rehabilitation (yes/no), one of the 11 different supportive conditions at work (yes/no), and time (baseline, 6 months, and 12

month). WAI, WAS, and all explanatory variables were normally distributed and assumed to be continuous. All least squares means analyses were statistically significant at $p \leq 0.001$. Restricted Maximum Likelihood (REML) solution was used.

3.4 Qualitative analyses

3.4.1 Paper IV

Paper IV used a grounded theory perspective (Charmaz, 2006). The purpose of grounded theory is to generate a theory by exploring social processes and human behavior (actions). Its theoretical base is symbolic interactionism (Hallberg, 2002), which states that "human beings act towards things on the basis of the meaning those things have for them", in conjunction with social interaction and individual interpretation. A category represents a unit of information composed of events, happenings, and instances (Creswell, 2007, Corbin and Strauss, 2008). Categories emerge from the data during constant comparisons; this is called the constant comparative method. Coding is essential while transforming raw data into constructions of the social process. Questions to be asked are: What is expressed here? What does this mean? What do we have here? What if? Is there a storyline within the data? What is this all about? An interview guide (presented in Swedish in Table 4) was used, although it was developed and changed throughout the process, along with the analysis. The researchers strove to maintain an open mind while collecting, coding, and analyzing the data.

Table 4. The final version of the interview guide used during the interviews (in Swedish).

Frågor och nyckelord. *Se till att området täckts in under intervjun.* *Frågorna behöver inte ställas i någon specifik ordning.*
Vad innebär återgång i arbetet för dig, vad har du för tankar omkring det? Berätta om din upplevelse av att återgå i arbetet med dina nackbesvär. Hur ser du på din egen situation, ansvar och roll i rehabiliteringsprocessen för att kunna återgå i arbetet? (möjligheter, situation, roll, ansvar) Beskriv dina erfarenheter av hur vård och rehabilitering underlättat eller gett förutsättningar för din arbetsåtergång? På vilket sätt har du kunnat påverka vården (för återgång)? (personligt bemötande, makt, ansvar, roll) Hur upplever du samarbetet mellan dig-sjukvård/rehab-arbetsplatsen? Beskriv dina erfarenheter av hur man på arbetsplatsen underlättat eller gett förutsättningar för din arbetsåtergång? På vilket sätt har du kunnat påverka arbetsgivaren (för återgång)? Beskriv dina egna mål med din arbetsåtergång? Vad tror du skulle kunna hjälpa dig att komma tillbaka till arbete? Är det något annat du vill ta upp som har att göra med dina möjligheter till återgång i arbetet?

Some grounded theory researchers have argued that researchers should enter the research area without doing any research in advance within the subject, and without carrying any theoretical perspectives. Instead, they should trust in the emerging results (Walls et al., 2010, Glaser, 1998, Corbin and Strauss, 2008). However, others have debated the usefulness and validity of this view. The question is whether a literature review can be used to improve, rather than hinder, the development of a theory (Chen and Boore, 2009, McGhee et al., 2007). It could be hard to analyze the data with no preconceived ideas, and as noted by Charmaz (2006) it is difficult to suspend one's pre-knowledge; in reality, all individuals (researchers) have existing knowledge and experiences . On the contrary, therefore, the researcher ought to use this as an advantage. The researcher is a social being within a social process (Walls et al., 2010). In this paper I chose to do the literature review in parallel with the analysis, and as the theory emerged I tried to see other researchers' standpoints.

After the interviews had been performed, they were transcribed verbatim, and the text was read and reread several times. This procedure took place in parallel during the whole process of analyzing, interviewing, and coding. The use of grounded theory meant that the data were analyzed from the very beginning of the data collection process; codes were created, notes were made, and memos were written continuously (Charmaz, 2006). This step was performed in conjunction with the other authors of the paper. Memos were written during the entire process to help keep track of thoughts, reactions, feelings, reflections, and decisions, and to make the study auditable (Oktay, 2012). All coded transcripts were reviewed by senior researchers to ensure consistency and accuracy. Saturation was assessed to confirm the adequacy of the sample size as well as the sufficiency of the data to support the elaboration of the concepts and their dimensions (e.g., frequency, duration, or severity). The grounded theory process consists of writing analyses and seeing a model emerge. One primary goal with grounded theory is to experience the model, and then to make the model and the new knowledge available and see them used (Ekman et al., 2000).

3.4.2 Ethical approval

All studies underwent ethical inspection by the Regional Research Ethics Committee: those described in Papers I–III in 2005 (ref: 387-05) and that described in Paper IV in 2012 (ref: 149-12). The researchers followed the guidelines of the World Medical Association Declaration of Helsinki: Ethical Principles for Medical Research Involving Human Subjects (2001). Informed consent was obtained from every study participant in Paper II and from the interviewees in Paper IV. Ethical considerations were of crucial importance from the start, and ethical issues were discussed during the process. All professionals working with the study needed to have knowledge about the Helsinki declaration.

4 RESULTS

Results from Paper I-IV are presented in this section; for more specific and detailed information, see the individual papers. Some additional results are also presented here.

4.1.1 Paper I

At baseline, two-thirds (67%) of the participants scored within the WAI category for poor work ability, a quarter (26%) had moderate work ability, and a few (7%) had good to excellent work ability. Among individuals on 25–100% sick leave, most scored poor (71–78%) or moderate (17–29%) work ability. Using the WAS, 70% had poor work ability, 19% had moderate work ability, 9% had good work ability, and 3% had excellent work ability. There were some differences in WAI and WAS ratings between groups of diagnoses/disorders (Table 5). The highest proportion of poor work ability (WAI and WAS) was seen among individuals with cardiac disease. Of individuals on up to 25% sick leave, 83% rated poor or moderate WAI; the corresponding figure among individuals on 50% sick leave was 100%. Most individuals rated poor and moderate WAS (88-77%), only a few individuals rated excellent WAS, mostly individuals worked close to full-time (Table 6).

Table 5. Work Ability Index (WAI) categories presented for specific diagnoses/disorders and sick leave degrees at baseline among 289 women on long-term sick leave from human service organizations.

Category	Poor WAI*		Moderate WAI*		Good WAI*		Excellent WAI*	
Diagnosis/disorder **	**n**	**(%)**	**n**	**(%)**	**n**	**(%)**	**n**	**(%)**
All (n=289)	194	(67)	75	(26)	17	(6)	3	(1)
Musculoskeletal	102	(74)	31	(23)	4	(3)	0	(0)
Mental health	87	(71)	31	(25)	4	(3)	0	(0)
Cardiac	20	(87)	3	(13)	0	(0)	0	(0)
Pulmonary	20	(71)	8	(29)	0	(0)	0	(0)
Musculoskeletal & mental health	73	(76)	22	(23)	1	(1)	0	(0)
Sick leave degree								
0-25%	19	(30)	34	(53)	7	(11)	4	(6)
26-50%	12	(71)	5	(29)	0	(0)	0	(0)
51-85%	5	(71)	2	(29)	0	(0)	0	(0)
86-100%	158	(78)	35	(17)	9	(4)	0	(0)

*WAI = Work Ability Index: poor (7–27), moderate (28–36), good (37–43), and excellent (44–49).

** The numbers do not add up to the full 289, as not all diagnoses/disorders are represented, and individuals could have more than one diagnosis/disorder.

Table 6. Work Ability Score (WAS) categories presented for specific diagnoses/disorders and sick leave degrees at baseline among 317 women on long-term sick leave from human service organizations.

Category Diagnosis/disorder**	Poor WAS* n(%)	Moderate WAS* n(%)	Good WAS* n(%)	Excellent WAS* n(%)
All (n=317)	221(70)	27(9)	56(18)	13(4)
Musculoskeletal	114(75)	13(9)	20(13)	4(3)
Mental health	95(74)	13(10)	19(15)	2(2)
Cardiac	19(76)	2(8)	3(12)	1(4)
Respiratory	20(67)	3(10)	7(23)	-
Musculoskeletal & mental health	81(79)	9(9)	11(11)	2(2)
Sick leave degree				
0-25%	13(24)	6(11)	28(51)	8(15)
26-50%	19(86)	1(5)	2(9)	-
51-85%	6(75)	2(25)	-	-
86-100%	173(80)	16(7)	24(11)	4(2)

*WAS = Work Ability Score: poor (0-5), moderate (6-7), good (8-9), and excellent (10).

**The numbers do not add up to the full 317, as not all diagnoses/disorders are represented, and individuals could have more than one diagnosis/disorder.

In the total group, there was a very strong association between the WAI and WAS (r=0.87). Both the WAI and WAS showed similar patterns of associations with sick leave degree (r=0.43 and r=0.47), health (r=0.45–0.66), and symptoms (r=0.15–0.45). The Spearman correlation between WAI and WAS was very strong for all specific diagnoses: musculoskeletal disorders, mental health disorders, cardiac disease, pulmonary disease, and co-morbid musculoskeletal and mental health disorders (Table 7). For changes in WAI and WAS, the correlation was very strong for cardiac disease and mental health disorder, and strong for other diseases/disorders (Table 8).

Table 7. Correlations between Work Ability Index and Work Ability Score within specific diagnosis groups at baseline among women on long-term sick leave from human service organizations.

	Work Ability Score	
Work Ability Index	**r**	**p-value**
Diagnosis/disorder		
All	0.87	<0.001
Musculoskeletal	0.83	<0.001
Mental health	0.87	<0.001
Cardiac	0.81	<0.001
Respiratory	0.84	<0.001
Musculoskeletal & mental health	0.84	<0.001

Table 8. Correlations between changes in Work Ability Index and changes in Work Ability Score within specific diagnosis groups at baseline among women on long-term sick leave from human service organizations.

	Changes in Work Ability Score	
Changes in Work Ability Index	**r**	**p-value**
Diagnosis/disorder		
All	0.77	<0.001
Musculoskeletal	0.80	<0.001
Mental health	0.84	<0.001
Cardiac	0.90	<0.001
Pulmonary	0.76	0.001
Musculoskeletal & mental health	0.75	<0.001

In the analysis of repeated measurements over time, more explanatory variables were statistically significant for the WAI than for the WAS. The parameter estimates were slightly higher for WAI than for WAS. In case of a change of the explanatory variables, the effect would not be large for either WAI or WAS. The variables included in the model (Sick leave degree, HRQoL, Self-rated general health, Vitality, Behavioral stress, Neck pain) explained 72% ((59.4–16.4)/59.4) of the between-person variance for WAI questions and variables included in the model (Sick leave degree, HRQoL, Vitality, Current stress) 93% ((16.4–1.1)/16.4) of the between-person variance for the WAS question.

WAI, WAS, change in WAI, and change in WAS all predicted future sick leave degree, HRQoL, vitality, neck pain, self-rated general health, self-rated mental health, behavioral stress, and current stress). In the models (6-month follow-up), WAI explained 84% ((255.9–41.6)/255.9) of the between-person variance and

14% ((208.0-178.5)/208.0) of the within-person variance in HRQoL, and 63% ((1,075.4–401.1)/1,075.4) of the between-person variance and 34% ((384.6-254.2)/384.6) of the within-person variance in sick leave degree. WAS explained 72% ((277.1-78.1)/277.1) of the between-person variance and 6% ((189.1-177.3)/189.1) of the within-person variance for HRQoL, and 67% ((1,044.1-345.9)/1,044.1) of the between-person variance and 31% ((395.7-273.1)/395.7) of the within-person variance for sick leave degree. Overall, WAI and WAS explained 5–37% of the between-person variance and 4–31% of the within-person variance for vitality, self-rated general health, current stress, behavioral stress, self-rated mental health, and neck pain. WAI and changes in WAI usually explained more of the between-person variance compared with WAS and changes in WAS. The same pattern was seen for within-person variance.

For the models (12-month follow-up), WAI and WAS explained 61% ((1,581.5-611.4)/1,581.5) and 52% ((1,331.9-644.6)/1,331.9), respectively, of the between-person variance in sick leave degree, and 13–36% of the between-person variance for vitality, behavioral stress, mental health, neck pain, and current stress. With regard to the dependent variables, the WAI explained the between-individual variance slightly better than did the variables for the WAS question.

4.1.2 Paper II

In the myofeedback intervention group, both self-rated vitality and laboratory-observed work ability (cutlery wiping performance test) improved between baseline and follow-up. Individual working degree increased, but not significantly. In the intensive musculoskeletal strength training group, WAI, WAS, and self-rated mental health improved between baseline and the three-month follow-up. There were no significant changes in any of the laboratory-observed work ability tests. Working degree increased significantly ($p<0.05$) for this group over time. In the control group, both neck pain and working activity increased between baseline and the three-month follow-up. Working degree also increased ($p<0.05$).

The mean response for the WAI average across intervention groups changed over time. However, there was no statistically significant difference between intervention groups over time. In the control group, WAI increased between baseline and the one-month follow-up. WAI also increased between baseline and the one-month follow-up in both intervention groups, but in comparison with the control group there were no improvements. Decreased pain was associated with increased WAI at the one-month follow-up and with increased laboratory-observed work ability (cutlery wiping performance test) at the three-month follow-up. It was also associated, though not significantly, with increased

laboratory-observed work ability (dexterity/gross movements) at the one-month follow-up. Decreased muscular activity in the trapezius muscle was associated with increased WAI and increased cutlery wiping performance test at the three-month follow-up. Self-rated work ability increased among the intensive muscular strength training group, and vitality increased among the myofeedback training group. For both intervention groups, pain was lower over time compared with the control group. Neck pain differed between the intervention groups over time. Neck pain increased in the control group between baseline and three months. For the myofeedback group, pain decreased between baseline and one month. For the muscular strength training group, pain decreased between baseline and three months in comparison with the control group.

4.1.3 Paper III

The most frequently used rehabilitation measures were medical treatment, self-directed physical exercise, and physiotherapy. About half of the study population had participated in socially/psychologically-focused rehabilitation and/or complementary medicine. A third of them had participated in rehabilitation courses/programs. A quarter of them had participated in rehabilitation at the workplace, while only a few had participated in offsite rehabilitation. The distribution of rehabilitation measures was relatively equal among the different age groups except that rehabilitation at the workplace and socially/psychologically focused rehabilitation were more common among the middle age group (45-54 years).

Individuals on sick leave for longer than a year reported more participation in rehabilitation courses/programs (PR [95% CI]: 3.33 [1.90; 5.84]) and in socially/psychologically-focused rehabilitation (PR [95% CI]: 1.48 [1.13; 1.95]) compared to their counterparts on sick leave for less than a year. All rehabilitation measures were positively related to increased WAI, increased WAS, and increased working degree at both the 6-month and 12-month follow-up. The individuals who underwent workplace rehabilitation had the greatest increase in work ability and working degree at both follow-ups. Participation in workplace rehabilitation was positively associated with increased work ability (PR [95% CI]: 1.78 [1.38; 2.29]) and RTW (PR [95% CI]: 1.40 [1.09; 1.80]). Additionally, being pleased with the employer's efforts to help them RTW was positively associated with increased work ability (PR [95% CI]: 1.91 [1.14; 3.19]).

Supportive conditions at work and workplace rehabilitation had a major impact on work ability and RTW. At baseline, most participants (65%) were wholly or partly dissatisfied with their employers' efforts to help them RTW and one in four (24%) were not satisfied at all. Work ability increased significantly more over

time among individuals provided with workplace rehabilitation and supportive conditions at work such as a sense of feeling welcome back at work, influence at work, possibilities for development, degree of freedom at work, meaning of work, quality of leadership, social support, sense of community, and work satisfaction. These participants also scored higher WAI in comparison to those who had workplace rehabilitation but no such supportive conditions. There was strong agreement between WAS and WAI. Additionally, individuals provided with workplace rehabilitation and supportive conditions increased RTW (in terms of working degree) significantly more over time compared to those individuals with no workplace rehabilitation and no supportive conditions. The mixed models for different age groups showed that younger individuals scored higher WAI and WAS than the older individuals. However, all age groups presented the same pattern of improvement of these outcomes over time.

4.1.4 Paper IV

The interviewees had different views, strategies, and approaches in the RTW rehabilitation process, but all were *striving to work* (core category). They expressed a desire to work, their goals for work, and their wishes for work. They expressed an optimistic mindset to be working, and they also described creativity, decisiveness, determination, and visionary thinking about their prospects of working. Working is what people do, and this was what they strive to do.

During the process of rehabilitation for RTW, the women experienced their interaction with stakeholders as either *controlling the interaction with stakeholders* or *struggling in the interaction with stakeholders*. The path to RTW was a complex one. The women described two kinds of approaches for coping with RTW, both involving fluctuating work participation (yo-yo working): *yo-yo working as a strategy* and *yo-yo working as a consequence*. There was a certain degree of "going in and out" of work participation, with periods of sick leave interleaved with periods of work. Yo-yo working was a way to handle participation at work, as the individuals fluctuated in their working degree over time. The women using yo-yo working as a strategy were creatively enterprising, taking responsibility, driving, and working hard to achieve success in their RTW process; they held control in their own hands. Women with yo-yo working as a consequence were those who unquestioningly complied with other stakeholders' instructions for RTW; they waited for and obediently followed orders, with a feeling of struggling in the rehabilitation process.

The women experienced that the stakeholders were focusing on their impairments, disabilities, and limitations. Thus, the focus was on functions the individual was unable to perform in working life, instead of their assets for working. Most of the individuals expressed negative experiences in relation to

collaborating with administrators at the Social Insurance Agency. They had the feeling of not being listened to, and not believed; and the administrators were the ones that had the final say. Women were often insecure and even terrified in these meetings, as they did not know what to expect. They felt that the administrators believed that they were not willing to work at all, despite the fact that this was their main wish. Some women mentioned being met with professionalism, trust, and expertise during their collaboration with administrators at the Social Insurance Agency, but they said that this was because they had been fortunate to meet the right person at the Social Insurance Agency; someone who saw their capabilities for working. Some women even mentioned that the Social Insurance Agency demanded large amounts of paperwork from them when they were unable to work and function normally due to being hospitalized. This caused them a lot of pressure and anxiety, negatively affecting their rehabilitation process.

The women expressed their feeling that the stakeholders' highest priority was the paperwork and their focus was almost solely on formalities. The women experienced this as time-consuming and heavily bureaucratic. The stakeholders were delivering divergent and changing messages and instructions to the women regarding their rehabilitation and sick leave status, and so the women did not know the direction of the process of RTW or even if it was supposed to lead to RTW.

In their collaboration with the Employment Agency, the women felt they had to apply for a certain number of working positions to be entitled to compensation. Even when they were convinced they were not eligible for a given work position due to being incapable of performing that type of work, they applied anyway in order to satisfy the system. Other concerns included the feeling that employers did not have positive attitudes towards employing individuals previously on long-term sick leave. The women perceived the Employment Agency as having no comprehension of these conditions and no readiness to respond to these situations. The hostile attitudes from stakeholders, as perceived and expressed by the women, made them feel insecure, worthless, and even scared. When having to defend their reasons to be on sick leave, individuals had the feeling of being misbelieved, and that the stakeholders did not believe they were striving to work. They felt that people thought that they were not entitled to sick leave compensation, and that they just did not want to work. Some individuals had the feeling that they were seen as second-class citizens who did not contribute to society. They were deeply concerned over their situation of being on sick leave, and they had a feeling of being parasites on society.

The women with poor or moderate work ability noted that their colleagues had different reactions and responses; they were either supportive, or were tired of

being supportive. Nevertheless, the women returning to work said that they did not make complaints to their employers, supervisors, or colleagues; rather, they blamed themselves for not functioning at work.

The fact that they were employed by the municipality led to higher expectations for support from the employer. The women felt that, in comparison to a private employer, the municipality had greater obligations and duties to assist its employees back to work and through hard times. They believed that the municipality, as an employer, should look after its employees and create work that fitted the individuals' needs, regardless of individual limitations. Their feeling about working within the municipality was that it should be a "safety net".

5 DISCUSSION

The results described here provide important findings for improving work ability and RTW among women on long-term sick leave. These individuals are striving to work, and it is essential that they should be supported at work. There are simple interventions available for neck pain, and the single-item WAS offers an easy way to assess and evaluate these women's work ability. The women need to participate and be involved in the rehabilitation process, and they should be supported in making their own decisions in this process, to allow them to increase their work ability and help them RTW. It is crucial that the individual is accounted for as the most important stakeholder in the rehabilitation process, and when an individual does not have enough strength, the stakeholders should provide a supportive structure during the transition period. Earlier studies have highlighted the individual's sense of control as important for the RTW process (Ahrberg et al., 2010). Individuals' attitudes and beliefs about RTW (Heymans et al., 2006), as well as having a high degree of influence over one's own rehabilitation process, can explain RTW among workers on long-term sick leave (Landstad et al., 2009b). Comparable factors were also found in our results, thus showing the great importance of supportive workplace conditions. We also found that interventions which the individual controls themselves, like intensive muscle strength training, makes it easier to combine rehabilitation with work attendance, as the timing and place are flexible.

5.1 Wanting to return to work

Regarding the decision over whether to go on sick leave or return to work (Johansson, 2007), the individuals in our studies did not express this process in terms of selecting, but rather in terms of the strategies being used, with yo-yo working (fluctuation in working degree) described as either a strategy or a consequence in attaining a good work-life balance. Accordingly, the individual's decision is dependent on their own views, attitudes, and opportunities regarding the best way to recover and to increase their health and work ability. These findings support the push-and-pull theory of individual decisions on taking or staying on sick leave (Stikeleather, 2004). Other potential work-related push factors include being unwillingly forced from the labor market, not fitting in anymore, or being work-disabled (Stattin, 2005). Other qualitative studies including women have reported results similar to ours; individuals wanting to return to work, a feeling of meaningfulness, and work contributing to individuals' feeling of good health (Ahrberg et al., 2010). Our results are further supported by a literature review conducted by Saunders and Nedelec in 2013, affirming the

meaning of work for work-disabled individuals; they experienced work as a source of identity, feelings of normality, financial support, and socialization, accordingly increasing return to work and improving their work ability (Saunders and Nedelec, 2014). Our results in Paper III underline the findings of Saunders and Nedelecs (2014); feeling welcomed back to work is essential for RTW, making it possible to feel wanted and to socialize at work.

5.2 Factors improving return to work

Karlsson et al. (2010) have highlighted the importance of collaboration between the person on sick leave and the other stakeholders regarding work accommodation and the rehabilitation process (Karlson et al., 2010). It is a major challenge to get all stakeholders involved, with everyone in the team aiming for the same goal and collaborating with a focus on the individual, preferably with someone coordinating the process together with the individual. Stakeholders and society must bear in mind that — as we found in our results — women on long-term sick leave want to work and strive to work, and they use different strategies and approaches when trying to RTW and when collaborating with stakeholders.

Our participants' experiences of collaboration with health services and the Social Insurance Agency were diverse, and they were not entirely satisfied with the usefulness of this collaboration for daily life and improving work ability. In addition, the stakeholders were pulling and pushing them in different directions. They felt that their contacts with the Social Insurance Agency were more focused on administration than on work ability. Other researchers have found that people with musculoskeletal disorders were more likely than people with mental health disorders to have a good personal contact with the Social Insurance Agency. A Norwegian study of individuals on long-term sick leave emphasized the importance of knowing that the individual's needs in the rehabilitation process, as well as their need for rehabilitation measures, vary between individuals with different diagnoses (Landstad et al., 2009a), further demographic factors need to be addressed. There are simple actions that could be favorable for RTW among women on long-term sick leave; for example, supportive conditions at work are important in increasing work ability and RTW. A large European study from 2012 involving a collaboration between 13 countries found that poor psychosocial work factors are a risk factor for sick leave, and the authors addressed the importance of integrating the work environment in the rehabilitation process (Niedhammer et al., 2013).

There are findings emphasizing the importance of combining sick leave with part-time work. Colleagues could be involved in the integration process, which could enable individuals to keep in contact with their workplace and colleagues. It is

beneficial for employers to have knowledge about the rehabilitation process, in order to enhance the work environment from a psychosocial perspective. Further, as found in our results, workplace rehabilitation in combination with supportive conditions at work provides favorable circumstances for the individual to enhance their work ability and RTW, and could be easier to implement with the involvement of colleagues. Another favorable factor for work ability is having a secure employment, with no risk of the workplace closing down (Lindberg et al., 2006b). Timing of the rehabilitation measures is also important, and early intervention has been discussed as a stepping stone for RTW (Tveito et al., 2004, Stattin, 2005), but rehabilitation activities initiated too soon are not always favorable (Ekberg & Linton 1994, Läkartidningen). The timing ought to be judged individually in each specific case, in conjunction with the person affected.

5.2.1 Supporting the return to work process

There is a great need for society to focus on women on long-term sick leave from HSOs, particularly women with neck pain, in order to be able to increase these women's work ability and help them return to work. These women affect society as a whole, and not just a small, isolated segment; in addition, they are heavily affected themselves. Societal systems do not provide the type of care and support that the individual needs, seeks, and wants. Using the health care system and other services often results in the service taking over the person's life, rather than the person feeling supported by the services (Beresford, 2011). Frustration often emerges within this collaboration, with the employee feeling constrained, controlled, and abandoned, and the service providers feeling disappointed due to having failed to provide the required services. The individuals involved lack knowledge and understanding of the system. There is now a strong desire for a change within the social system, involving the idea that people should have the individually-matched support they need to optimize their life and quality of life; in other words, person-centered care. This topic is an important one for politicians, government, and employers to address, in order to retain the high standard of the Swedish welfare policy and to ensure an inclusive labor market which a person can enter even with a chronic disease or a disability, allowing that individual to be included and not excluded.

Health conditions are generally good in Sweden, but in the direction to be more unequal within segregated areas with low social class. Individuals want to be part of the workforce and to earn a living, even though individuals had limited health resources and capacities they want to work; similar results was also found in a Danish study of both women and men (Thorsen et al., 2013). Stakeholders ought to focus on workplace adjustment and adapting the working environment in order for individuals on long-term sick leave to RTW. Work in today's society has a

tendency to be more flexible in terms of work accommodation and working schedule, but this is not the case for women working within HSOs, as they often need to be at the workplace at specific times or to perform tasks at certain times. It is worth asking whether the employer or the organization has tried to discuss whether work for HSO employees could become more flexible, with individuals taking more responsibility for decisions on how to accomplish working tasks. These activities at the workplace can increase work ability and RTW for individuals. In the current climate, there is a feeling that everything should be more effective and costs must be reduced; but on the other hand, it is not unreasonable to believe that the municipality ought to think about decreasing personal suffering.

One way to get individuals more involved and more in charge of the rehabilitation process could be through effective person-centered care (PCC). This type of care could allow the individual not only to be more involved themselves but also to be better prepared to perform more effective self-care when living with a chronic condition, thus allowing them to work with good work ability.

The definition of PCC varies slightly, but the key is to start from the patient's perspective. Mead (2000) defines PCC in terms of five dimensions: the relationship between body and soul, individual and group; the individual's own view of their situation; shared power and responsibility; the relationship between everyone involved; and the stakeholders' personal approach (Mead and Bower, 2000b, Mead and Bower, 2000a). In Sweden, the Health Act (HSL 1982:763), the Social Services Act, and regulations issued by the National Board all emphasize that care must be characterized by respect for individual privacy and autonomy (SFS, 1982:763). Thus, professionals need to take individuals' autonomy, privacy, and respect into account when collaborating. The Health Act stresses that care and treatment ought to, as far as possible, be conducted in consultation with the individual. Individuals have traditionally been assigned a passive role in health care and the RTW process, but there is now a trend towards strengthening the individuals' role (Prueksaritanond et al., 2004, Ekman et al., 2007, Ekman et al., 2000, Balint, 1955, Covinsky et al., 1998).

One way to do this could be for stakeholders to work with a PCC perspective. Consequently, there is a need to develop methods to integrate and involve the individual in the decision making regarding their care and rehabilitation process. It is important to find out what impact the disease/disorder has on the individual, and what the attitudes and strategies towards sick leave and the RTW process mean to the individual specifically from a work-life perspective as an employee. Individuals' strategies would then be placed in a context for stakeholders, and the interaction between the individual and stakeholders could be enhanced in the

RTW process. Recent research on RTW has shown the importance of social coherence with a good and honest relationship between the individual and stakeholders that includes the individual perspectives and the environment, and not only the disorder/disability (Carroll et al., 2010). To increase PCC, stakeholders (particularly nurses and physicians) need to be aware of linking individuals' perspectives with professional perspectives, and of doing this in collaboration with other stakeholders. The collaboration should be colored by mutuality and equality, and an honest belief in the individual's ability to make their own choices about RTW and the rehabilitation process. Holliday et al. (2007) have argued that a more PCC leads to more effective treatment and rehabilitation, increased patient satisfaction, and individuals' desire to be involved (Holliday et al., 2007); the optimistic view is that this will lead to improved work ability and increased RTW. The Declaration on Patient-Centered Health Care states that health care providers should focus on the abilities and strengths of the patient as an individual, rather than on the disease/disorder (Penney and Wellard, 2007). Stakeholders should explore individuals' competences and advantages, and ask what the individual is capable of doing; they should assess work ability rather than work disability. The use of PCC allows the individual to be involved themselves and thus to be better prepared to perform the self-care which living with a chronic condition demands, in order to regain their work ability and to be a satisfied individual who wants to RTW.

5.2.2 Individual actions for returning to work

There is evidence that individuals going through the rehabilitation process need to be more aware and have more knowledge about their own health and disease/disorder, in order to effectively achieve satisfaction and increased outcomes such as RTW. We as professionals should support these individuals in becoming more involved in, and preferably taking charge of, their own RTW process. Research suggests that stakeholders should have regular meetings during the process to enhance and give opportunities for the individual to RTW. Swedish regulations state that this should be done, but the women in our studies expressed that they lacked these meetings; and if the meetings were held, they were only passive attendees who did not participate. One study found that individuals in the rehabilitation process experience co-ordination among stakeholders in diverse ways (Landstad et al., 2009b). Hedlund (2008) suggested the use of a rehabilitation coordinator, and noted that there needs to be scheduled time for feedback to individuals and stakeholders; their findings implied a need of rewarding, teaching, evaluating, and developing the collaboration with stakeholders, regarding the individual rehabilitation process (Hedlund 2008). If stakeholders and individuals have different perspectives during meetings it is difficult to reach the goal of increased work ability and RTW. There is a need to

make a rehabilitation plan and settle an agreement, and this plan does not involve convincing the individual that the stakeholder's perspective is the correct one to be followed; rather, different views should be seen as something to overcome. It is worth remembering that nobody has the complete truth, but everyone has their own truths.

5.3 Hindrances to returning to work

The attitudes of colleagues and employers when interacting with and approaching the individual on long-term sick leave affect the outcome of RTW; a previous study found that individuals in this situation felt as if they were a second-class labor force (Hedlund 2008), as also expressed by the women in this study. Not being in the mood or not feeling recovered when beginning work was associated with poor work ability (Lindberg et al., 2006b)

Other issues to bring up are discussions concerning encapsulated occupation (wrong occupation) and encapsulated workplace (wrong workplace) among individuals on long-term sick leave. Individuals' life conditions, health resources, and work ability for specific types of work can all change over time; this has been shown to be a reason for work disability and thus could result in sick leave. When an individual believes that their disorder was caused by work, they may be less enthusiastic about RTW (Hedlund 2008). My speculation is that these topics could be too sensitive to discuss, or there may have been no time for discussion. The women employed by the municipality had been relying on supervisors and the system to arrange a solution.

Stakeholders working with individuals on long-term sick leave with a disability should focus more on individuals' lives and their inclusion in the workforce rather than the disease/disorder. I believe stakeholders could benefit from promoting PCC while working, and this also might be helpful for the individual in the integration back to work which is a part of daily life.

Our participants with neck pain expressed feelings of not being believed, being mistrusted, and feeling insecure in their contacts with the Social Insurance Agency. This is supported by a recent quantitative study in which long-term sick listed individuals reported their RTW as being affected by negative encounters, feelings of disrespect, and being mistreated (Lynöe et al., 2013). The same study reported that individuals felt disbelieved, not trusted about their symptoms disorders/diagnoses, and questioned over whether they wanted to work or not. A Norwegian study investigated experiences of professional support for RTW among individuals on long-term sick leave, and found that health care,

physiotherapy, and personal programs were of high importance, but that waiting periods were too long (Landstad et al., 2009b).

5.3.1 Neck pain and return to work

One remarkable finding from our interviews was that the interviewees hardly mentioned their neck pain. When the interviewer asked explicitly about neck pain, the participants expressed the opinion that they just had to live with it. It is not easy to "just live with" neck pain, as this pain affects both work ability and performance at work. I believe that living with pain is not the same thing as dealing with and coping with it. Neck pain is a very common symptom among workers, and varies within different professions. A large cohort study recently found that neck pain was predicted by the individual's being exposed to high job demands, lack of leadership and support, neck flexion, and lifting in awkward positions (Sterud et al., 2014); the researchers suggested that interventions focusing on reducing neck pain would benefit the general population and society.

5.4 Definition of concepts

The women in our study expressed diverse goals and meanings when it came to work ability in the rehabilitation process for reaching RTW. Previous results have discussed the importance of that the concept of work ability are interpreted in a similar way. Often this were not the case; women also described their work ability and the factors affecting their work ability and RTW in disparate ways, which can complicate the process. This could be related to the issue of there being no clear definition of the concept of work ability (Seing et al., 2012, Bohle et al., 2010, Sturesson et al., 2013, Ståhl et al., 2011). If there were a clear definition, it might be easier to know the responsibilities and duties of all stakeholders within the process. Professional stakeholders should, at least, have knowledge about the concepts and instruments used in assessment and evaluation of work ability in the rehabilitation process. My speculation is that stakeholders could be more effective in supporting the individual in the rehabilitation process, which might lead to improved work ability and RTW. Furthermore I anticipate the need for a focus on cultural differences; my experiences in meeting the individuals participating in these studies, is that employees working within HSOs tend to have diverse cultural backgrounds.

The definition of health has been discussed, and unclear definitions could affect interventions, research, and health care. Health is often an outcome measure when evaluating interventions and research (Huber et al., 2011). Researchers therefore need to be clear about how they define the concept of health, in order to be certain that the individual's answers are relevant to the question. Self-rated health is the

most common way to assess health in epidemiological research; it is cost-effective and uncomplicated, and has often been shown to be a reliable predictor for work ability and RTW.

5.5 Methodological discussion

5.5.1 Recruitment

The women recruited to the cohort on long-term sick leave were from a major city in Sweden, representing different social class districts, different professions within the HSO, and different levels of responsibility, though they were all working within the municipality and hence within the same organization. Thus the individuals were not randomly selected from the whole country of Sweden, and they did not include all different type of professions; for example, none of them were blue collar workers. Nevertheless, it could be an advantage that the study population was homogeneous in terms of sex, employer, organization, and working conditions. On the other hand, one should ask whether the results could be relevant to application in another context. Many professions are service professions or caring professions, and even individuals who do not work for the municipality could have similar working demands, making the results in this thesis transferable to other contexts.

Of the 633 individuals who were invited, 324 (51%) chose to participate in the study. When we were only supplied with one set of address labels, there was no possibility of sending reminders, and we could not confirm that every invitation had reached its intended recipient. There could have been other reasons for drop-out in our study, similar to those in another (Norwegian) questionnaire study among individuals on long-term sick leave which had about the same response rate (50%; n=740/1493). The disadvantages of using a questionnaire could be that individuals with insufficient reading, writing, or Swedish skills could find it hard to answer, or could even misinterpret the questions, leading to a large dropout. This could have been the case in the present study, given that from 633 individuals only 324 wanted to participate in the cohort. The risk of failure also increases if questionnaires are too extensive. There was no opportunity for individuals to ask questions in order to avoid misunderstandings in the questionnaire; however, contact details were provided and some individuals did make use of these to ask further questions about anonymity, or to note that they felt the questionnaire was very tedious and they wondered if it mattered that it took some time to fill in the questionnaire. Individuals participating in the RCT had the opportunity to ask questions while they filled in the questionnaire at the clinic.

The advantages of questionnaires are that they make it fairly easy to reach a great number of individuals, and are flexible in regards to when and where to answer; conversely, often questionnaires can be too wide (Polit and Beck Tatano, 2004), which could affect the credibility of answers given by individuals. Women on long-term sick leave often have a co-morbid mental health disorder, and it is possible that those with, for example, cognitive disorders, stress, or depression may drop out as early as in the first recruitment, along with women with a language barrier. It is important to discuss this issue and to focus on how to include immigrants with a native language other than Swedish in questionnaire research, as these women constitute a large group within HSO professions.

The study's internal validity may have been positively affected by the homogeneity of the study group, as the study group was similar and the intervention groups were similar, which is preferable from a validity angle. The study also had a control group, which strengthens the internal validity.

5.5.2 Sampling procedure

It is possible that the research project described in this thesis should have started with the interviews and qualitative analyses and then continued with the questionnaire and interventions; in this way the RTC could have ended up in a different setting. In the interviews, the women hardly discussed their neck pain as an issue for their decreased work ability or RTW. Further questions might have been more targeted, and the questionnaire could have been shorter and more focused and hence easier to fill in.

Of the individuals invited to the study, 51% decided to participate in the first run of the cohort. Drop-out analyses of the data were performed comparing the baseline, 6-month, and 12-month drop-outs; the results presented in Paper III are representative for all papers. We examined possible differences between drop-outs at follow-up and those participants fulfilling the study, and no significant differences ($p<0.05$) were found. For the individuals ($n = 309$) who chose not to participate at all, we were able to retrieve data from the employer for 186 individuals (60%). Of those individuals, 59% were on full-time sick leave and the remaining 41% were on part-time sick leave. In the participating group, 72% of the individuals were on full-time sick leave. It is possible that more of the individuals who chose not to participate had started to work, and hence did not have the strength, time, or interest to participate in this project. The age of the individuals among the non-participants was consistent with that of the individuals that chose to participate, and the proportions of individuals who had been on sick leave for less than 1 year were equal.

5.5.3 Data collection

Self-reported, register-based, observational, and interview data were collected over a period of time, and so we had several different variables over time for each participant. This made it possible to use statistical analytic methods for longitudinal data and qualitative methods for the text data. The longitudinal nature of the studies and the fairly large sample sizes add strength to the results. This made it possible to employ realistic models. Mixed models have begun to play an important role in statistical analysis, and offer many advantages over more traditional analyses. One benefit of mixed models is that all of the data can be used; a missing score does not prevent the analysis from being performed. Repeated measures were used; the participants were randomized into three groups (two interventions and one control group) and the observational and self-registered variables were obtained on three occasions over a period of time (baseline, one month, and three months). Another important aspect to consider when performing medical treatments is that even when results are statistically significant, the difference might not be of importance for the individual and thus not clinically important (Campbell and Machin, 1993). Conversely, in a small study which reports a large but not statistically significant difference, the difference might be of importance for the individual and thus clinically important; in this case, preferably the results would be presented with 95% CI.

The instruments and the single-item question

Bohle et al. have stated that because the concept of work ability is not rigorously defined and operationalized, the usefulness and accuracy of WAI as a measure is not fully acceptable; there needs to be a consensus regarding the concept before a suitable instrument can be defined (Bohle et al., 2010). Despite this, I suggest at this moment WAI and WAS are useful, effective, and simple tools to assess and evaluate interventions among individuals on long-term sick leave. This is additionally supported by a recent European study including a large population of both men and women with a variety of occupations and functions, in which the authors showed statistically significant validity between WAI and WAS and hence recommended the WAS for screening purposes (El Fassi et al., 2013). The same study showed that WAS explained the majority of variation in the full WAI. Very recent results from a cohort of male construction workers suggest that the full WAI should be used in favor of the WAS when predicting disability pension, although the authors also discuss use of the WAS as a primary screening tool, with the full WAI distributed to individuals with a low WAS (Roelen et al., 2014).

Studies have reported that individuals have difficulty correctly answering all 10 questions in the WAI, particularly items 4, 5, 6, and 7 (El Fassi et al., 2013). We

used the WAS as a complement in our study, as some researchers have stated that WAI items are not sensitive to changes over time, and the validity of WAS has been demonstrated (de Croon et al., 2005). In our data we did not see a pattern of individuals failing to reply to the items mentioned above, and there were only small differences in the number of participants answering the WAS and the full WAI over time. WAI does not assess workplace organization and conditions in more specific details, while we found in our results that supportive conditions could be beneficial for improved work ability and RTW.

Other studies on individuals' self-rated health have found that a single-item question (Falkenberg et al., 2009) predicts future sick leave. There is also research using self-reported work ability/disability and sick leave days as an indicator for RTW. The question is whether RTW is sustainable or not; to what degree are these individuals working, and what happened to them in between the measuring points? In measuring work absence, the researcher needs to uncover patterns of days not working and reasons for not working. There are also indications of forms of absence other than sick leave, such as individual leave days, unpaid time off, or even vacation. It is difficult to follow everything that happens in relation to RTW using self-report data, and due to ethical and privacy reasons it is difficult to get register-based data. Often an outcome of work ability is sick leave or working degree, with the implication that all individuals who score 100% full working degree have excellent work ability. In this study, the choice was to measure both the outcome of sick leave/working degree and WAI/WAS, and the results show that one cannot in fact draw the conclusion that full working time implies excellent work ability. Often individuals on long-term sick leave scored lower work ability, while working full time. This might explain the yo-yo strategy found in Paper IV, where individuals fluctuate in their working degree because they cannot manage or cope with full-time work.

5.5.4 Randomization and experimental design

Randomization is part of a classical experimental design. Through randomization, the researcher aims for equal groups representing the population. When using this type of experiment, participants do not need to be concerned about why they were selected for the intervention group or control group, as they know it was random. The researcher could suspect a tendency for individuals to be more likely to improve in their results when they are in the intervention group rather than when they are in the control group with nothing happening at all, and in an intervention study individuals are aware of which group they are in. The Hawthorne effect may also be relevant, as the two intervention groups were exposed to rehabilitation measures and attention, while the control group were not, there needs to be some attention to possible research group participation effects

(McCambridge et al., 2014). The benefits of randomization are numerous. Random allocation means that each individual has the same chance of ending up in the intervention groups or the control group, and this is unpredictable. A modified block randomization was used to ensure similar numbers of individuals in each group (Campbell and Machin, 1993). Randomization prevents selection bias and insures against accidental bias. It produces comparable groups, eliminates source of bias, and avoids confounding from other factors, both known and unknown. Randomization generates comparable intervention groups which are similar in their central aspects. The basic benefits of randomization are that it stabilizes the groups with respect to confounding or predictive variables, and it forms the basis for the statistical methods used (Suresh, 2011).

The researchers believed in the hypothesis that intensive muscular strength training or myofeedback training would decrease pain and increase work ability. Individuals were informed when starting the RCT that if they were selected for control group they would be offered the rehabilitation measure that showed good results. Thus the individuals in all the groups were invited to a seminar and informed about the results of the interventions, and all participants were offered the programs after the research ended. However, at the time of writing, no participant has yet asked for the program for the myofeedback training, but a few have been given the intensive muscular strength training program.

5.5.5 Analyzing data

When analyzing data over a period of time, one could expect some participants to get better on their own and some to stay in the same condition of pain and decreased work ability. It is also possible that more individuals could start rehabilitation measures of their own, affecting the outcome. Our participants had already been on long-term sick leave for a long period of time when the study started, and so there is a low likelihood that they would have suddenly started their own rehabilitation actions for decreasing pain. When comparing sick leave absence data with other countries, the context is of enormous importance; a relatively high proportion of women in Sweden are employed compared to other countries, and as in most countries more women than men work within HSOs (Stattin, 2005). There is an inequality in the labor force, with women being under-represented at senior positions, and more men than women working in general, but women have increased their participation rate in the labor market over time. Women do more unpaid work and have more responsibility for their families, and so participate more in paid part-time work (OECD, 2012).

5.5.6 Grounded theory

Grounded theory explains, rather than describes, the process of an activity expressed by individuals (Elliott and Jordan, 2010). Rigor and trustworthiness are two concepts used in qualitative research, and are analogous to validity and reliability in quantitative studies. To ensure the credibility of the project, the researcher must provide sufficient information to the reader to allow them to understand the research process in detail. Confirmability relates to whether the researchers were objective, whether the findings were grounded in the data, and whether the different researchers within the project reached consensus. The results could be applied to other situations in the same context (applicability, transferability) if there is a logic which is understandable in another context. Findings should be applicable in the real world (Glaser, 1998), and should be useful to practitioners (Oktay, 2012). The researchers aimed to achieve high quality while being extremely thorough, careful, trustworthy, and strict throughout the analytical process to ensure that the interpretation was grounded in the data (Cooney and Cooney, 2011, Chiovitti and Piran, 2003, Cutcliffe, 2000). Researchers need to remember that rigor must be built into the research process, or the findings would not hold up to scrutiny, would not fit similar situations/contexts, and would be invalidated in practice. We strove to keep to these criteria in performing this study and developing our theory. The term "reflexivity" can also refer to the problem of needing to remain neutral when researching other cultures and groups. In this study the group consisted of women on long-term sick leave, and the researchers were not part of this group and context. This background could give the researcher another thinking pattern that could affect the assessment of the research object; hence the presence of several researchers doing the analysis together strengthens the result.

5.6 The Swedish context

One concern is how health care can distinguish between accident/injury, disease/disorder, musculoskeletal/mental health disorders, and stress-related disorders. In some countries the systems differentiate in regards to what caused the work disability, and what happened to the individual, while in Sweden there is the same coverage and benefits for the individual regardless of why their work ability is decreased. It is difficult to judge why some accidents are regarded as applicable for coverage and some are not, when in the Swedish context the issue would simply be whether or not the individual has the ability to work in a position depending on time (current work position, other position at the same workplace or after 6 month any work available at the Employment Agency). Disease can both be physical and psychological, and some countries do not cover psychological injuries, stress, and/or diseases. It is important in Swedish society that there is no

difference between disease and injury/accident, or work-related and non-work-related conditions; stakeholders try to focus on work ability and not disability.

5.7 Ethical issues in research

Ethical dilemmas regarding participation in and withdrawal from an intervention study can always be discussed. The problem is common to all research projects and clinical trial settings/RCTs. While researchers may seek strategies to increase the retention rate, they need to be aware of the strict roles in research projects; a researcher could influence a participant to remain in the study, but this needs to be done without the individual losing their integrity. To ensure reliable results in the intervention study/RCT, it was of great importance that our participants wanted to participate, that we had their consent, and that most of the individuals completed the entire study, to make it possible to generalize and compare the results with other studies. The research articles often have inadequate reporting of refusal to participate and withdrawal. According to the Consolidated Standards of Reporting Trials (Altman et al., 2001), in order to improve the quality of studies it is important to report the refusals and withdrawals carefully, to facilitate a critical appraisal and interpretation of the data. Keeping a balance between demands for high quality research and ethical behavior towards the participants on the other, is very difficult. Researchers could push or persuade the participants to participate and to continue participating in a study in several ways, and there is no code of ethics covering this. In our studies, the women on long-term sick leave needed to be able to volunteer without feeling any pressure or obligation from the employer to participate. There was no contact between researcher and individuals employer except when initially recruiting the participants, and no results or findings have been discussed in specific details with employer. The primary principle in the Declaration of Helsinki is respect for the individual, and the participant has the right to resign from the study at any time without any reasons. The ethical challenge is to comply with this declaration and at the same time retain a high number of participants throughout the study. The solution is not always obvious.

An additional dilemma for Paper IV is that it could have been difficult and upsetting for the individual to talk about their experiences of the rehabilitation process, but on the other hand it may have been helpful for them to work through what had happened by talking about it. My experience from previous studies is that participants may find it good to talk about their perceived situation to someone who is interested in their situation and listening actively. They could also find it satisfying to participate in a study that could help to improve the rehabilitation process for women on long-term sick leave with neck pain.

Some participants refused to participate or withdrew from our study. There are several possible reasons for this. Reasons could have been lacking information on

the consequences of participating, or poor service or treatment from researcher, inconveniences in the study design (e.g. time consuming, insufficient or inflexible time for the research appointment), or problems accessing the research site (e.g. travel distance or the way to travel). Additionally, some participants were not happy with the compensation offered, either feeling it was too much or feeling it was too little. Patients with multiple illnesses, musculoskeletal disorders, or severe pain often tend to drop out from studies. Some drop-out rate is considered unavoidable. However, the literature does contain some possibilities to help minimize the refusal and withdrawal rate without losing the ethical aspect, particularly the Declaration of Helsinki (Gandevia and Tovell, 1964, Rickham, 1964), and studies by Forsman (Forsman, 1997), and Aitken et al. (Aitken et al., 2003); we also have some idea from our own experiences. One basic condition to achieve a good retention level in clinical trials is the selection of an appropriate sample. It is necessary for the researcher to determine a specific focus to ensure that the research question is successfully answered. Further, an analysis of the withdrawal in a previous study may improve the selection in further studies. It is important to provide a detailed and truthful explanation of the research design and to clarify the benefits and the risks of the study for the participant before recruitment. This information should preferably be provided in both written and oral form. From the ethical point of view, before the participant provides their informed written consent it is important for the researcher to be convinced that the participant really has understood the study information, which will result in a more voluntary participation. This will promote an active choice of participation in the study. If the participant does not want to join the study, they should not participate. The choice of person to give the information to the intended participant may also be of importance. It is an advantage if a neutral person in the research staff, without their own strong interests in the study, can inform the patient in a more impartial way, to really give the patient a free choice to decline the study. One way to increase retention may be to give incentives to the participants. There are different types of incentives. Providing compensation for the participant's travel costs and time is considered an acceptable ethical practice. However, it should be asked what the limit is for an ethically defensible payment, in addition to the examples mentioned above. If the compensation is too large, then the selection could be falsified by including participants not really suitable for the study; an overly large compensation could also increase dependence between the participant and researcher. On the other hand, if the compensation is too small, individuals may interpret it as no appreciation at all, though this may differ substantially between individuals. Incentives which are meaningful to the participants seem to be the most effective. Other kinds of incentives include continuity of the research/participant relationship, the perception of a greater level of care being taken in the study, and follow-up visits or telephone calls. Self-motivation is one of the most powerful incentives for continued participation in a

study, and should therefore be encouraged. Participants may express factors such as a wish to help current and future patients, or a perception that the study is important for the well-being of the community. The participants may also communicate gratitude to the caregiver and a desire to give something back. Another factor influencing high self-motivation among participants is their belief that they will benefit from extra information and contact with the researcher, compared to not participating in the study. Additionally, some participants may participate in a study because they think they might directly benefit from the research. To increase self-motivation in an ethical way, it is of great importance to be careful about the information provided as a motive for informed written consent. A good first impression when the participants initially meet the researchers is one of the major factors to minimize the dropouts in a study, also taking ethical considerations into account. The reception must be characterized by respect for the individual's integrity. Researchers have to be humble and grateful to the participants. Welcoming environments help the participant to feel valued. It is important to allow enough time for the appointment, and to offer a convenient time that suits the participant. We believe that a flexible reception is a necessary quality for a researcher to create a good relation, and an awareness of the relation between the participant and the researcher is of great importance. The relation has to be professional, but warm in an empathic way. Elderly people may be particularly inclined to try to please a person in a position of authority by giving their informed consent. Furthermore, an ethical reception means that participants with problems raised during the study should be taken care of and referred to the right caregiver.

It is important for the researcher to show respect for the participants at all times. Here I want to emphasize awareness of the challenge to produce excellence in research in an ethical way. Children learn values which form the basis for what they think is the right action, and these values change throughout our lives (Bengtsson et al., 1994). These values are not obvious, but within a social community in a specific context they are often based on the same grounds. Ethics are characterized by the humbleness to reflect on the difficulty of determining rights and wrongs; researchers need to be accurate and show modesty. Health care and nursing practice must be exercised in ensuring that the rights of the individual research participants are protected (Polit and Beck Tatano, 2004). At first, one might think that this is so self-evident that it requires no further comment. However, there are many occasions in intervention studies when this point has not been given any attention, and it has been crucial to have ethical guidelines in order to minimize harm and suffering (Bengtsson et al., 1994). Above all, when working within health care it is essential to do no harm, to do good, and to be fair (Haugstvedt et al., 2011, Polit and Beck Tatano, 2004).

6 CONCLUSIONS

We have identified factors of importance in improving work ability and return to work for women on long-term sick leave from human service organizations. A randomized controlled trial of an intervention among women with neck pain showed feasibility, improved work ability, and decreased pain.

The single-item Work Ability Score, WAS can be used as a simple indicator for assessing the status and progress of work ability among women on long-term sick leave.

The two interventions, intensive muscle strength training and myofeedback training, showed positive results suggesting they could be developed for health care practice to address neck pain and work ability. The intensive muscular strength training program, which is easy for the individual to learn and to perform at home, was associated with increased work ability.

The results highlight the importance of integrating workplace rehabilitation with supportive conditions at work to increase work ability and improve the return to work process for women on long-term sick leave.

Women with neck pain on long-term sick leave from human service organizations expressed that they were striving to work, and they wanted to work. In the rehabilitation process for returning to work, these women experienced their interaction with stakeholders as either controlling the interaction or struggling in the interaction. They described their coping strategies in terms of yo-yo (fluctuating) working: yo-yo working as a strategy or yo-yo working as a consequence. As a result, to a certain degree these women were going in and out of work participation, with periods of sick leave interleaved with periods of work.

7 FUTURE PERSPECTIVES

7.1 Clinical implications

These results could be useful for occupational health care, primary health care, the Social Insurance Agency, the Employment Agency, and society in general. The findings should be implemented in health care practice and in collaboration with the stakeholders involved in the rehabilitation process for improving work ability and RTW. Our findings have relevance for stakeholders working with work ability assessment and interventions for individuals on long-term sick leave. There are effective instruments to assess and evaluate work ability during daily practice within health care. Health care workers could use the WAS as an effective tool that predicts work ability, complemented with the full WAI when necessary. In addition, there are interventions which are easy to teach and to conduct for decreasing neck pain, and with this intensive muscle strength training the individual is the one in control. The combination of workplace rehabilitation and supportive conditions at work is very important in enhancing RTW, and stakeholders should be aware that feeling welcomed back to work is vital.

Women in this situation express that they want to work and are striving for work, but there are obstacles in their collaboration and interaction with stakeholders; this problem needs a greater focus. The results from this thesis suggest a need for better and closer collaboration with all stakeholders involved, particularly with the most important stakeholder: the individual. There is also a need for greater consensus on the concept of work ability, in order to increase work ability and RTW for individuals on long-term sick leave. The individual woman should be the most important stakeholder in the RTW process; she should be the one in focus, and her needs and possibilities should be taken into account in order to improve her work ability more effectively.

7.2 Future

To set up an intervention study, participants being individuals on long-term sick leave with a chronic condition, trying to implement and integrate the concept of PCC in the rehabilitation process for enhancing individuals' involvement and knowledge, further with a focus on the collaboration between stakeholders and the individual who should be in charge, this to improve the work ability and RTW.

In the future, Swedish society could face other perspectives when it comes to individuals on long-term sick leave. Many people are employed on short-term

contracts or in seasonal employment, and the workforce of the future will have a more multicultural background. How can stakeholders meet these new requirements and explore them, while remaining open-minded and seeing these issues as diversity rather than challenges?

Work integration of immigrant newcomers is one of my major interests. A newcomer is a person who leaves one country to settle permanently in another. About 14% of workers in Sweden are immigrants, and 17% of immigrants (vs. 7% of native Swedes) are unemployed. There is limited knowledge on the determinants of poor health and the links between work (dis)ability and health among immigrants (Johansson and Vingård, 2012:4). Immigrants generally have poorer health, more sick leave, more hospital care, more work-related accidents, more injuries and deaths, and more barriers in accessing social resources. One question is whether immigrants in the labor force have poorer health status than natives, or whether the working conditions change their health status over time.

Traditional measures such as work status, RTW, or sick leave degree can only reflect whether a person is present or absent from work; they do not provide any information about the person's level of participation or how well they can perform their work. It is important to be able to adequately assess an individual's functioning at work, in order to evaluate interventions and the work rehabilitation process. One possibility would be to use the Work Role Functioning Questionnaire (WRFQ), which could be implemented and used in the Swedish context.

8 ACKNOWLEDGEMENTS

One of the first things that comes to mind when writing acknowledgements is the importance of not forgetting to mention anyone. While I am sure I will forget someone special, you know who you are and you are not forgotten. I know you, I like you, and I trust you. Friends ♡

I particularly want to express my gratitude to all the women who kindly agreed to participate in the study, sharing your experiences and giving your time. Without your contribution there would not have been any studies.

Lotta Dellve, my supervisor, for encouraging me to start my PhD, for giving me all the opportunities, for your valuable thoughts, and for guiding me in the right direction. My warmest and dearest thanks.

Mats Hagberg, my co-supervisor, for helping me make the right decisions and for sharing your extensive experiences.

Karin Ahlberg, my co-supervisor, for providing the nursing support I needed so desperately, and for being clever, quick, and tremendously positive.

The MQ-FAS team; we were faced with a lot of hard work, but we managed it. Thank you all: Lotta Dellve, Lena Grundell, Leif Sandsjö, Mikael Forsman, Agneta Lindegård, Christina Ahlstrand, Roland Kadefors, and Mats Hagberg.

Christina A, the best colleague one could wish for. I will miss you.

Rose Marie, for providing me with laughter, conversation, inspiration, helpfulness, and energy.

Cina, for making us PhD students stick together and feel like a community, so we could support each other through all our hard work. We need that; thanks again.

Maria B and Maria E, my PhD buddies, for fruitful discussions, support, and straightforward feedback with no unnecessary hedging.

The research team and my colleagues at AMM, no one mentioned, no one forgotten. A big THANK YOU for being who you are.

The Swedish Research Council for Health, Working Life and Welfare (FORTE:) for financial support.

This work of writing this thesis has been greatly supported by the Work Disability Prevention CIHR Strategic Training Program, through the Canadian Institutes of Health Research (CIHR) grant(s) FRN:53909. The trainee program has provided me so much knowledge, collaboration, self-confidence, and friends for life.

Daniel, my partner, the love of my life, who always gets to hear and is willing to listen to what I have to say about new results and recent articles, and who dares to disagree that he does not always agree with me.

Max, my son, you are the warmest sunshine. You remind me of the other vital things in life, such as watching you play sports. Through you I have been able to drink coffee and socialize with the parents of other sports-mad children, and even got the opportunity to meet Henrik Lundqvist, goalkeeper for the New York Rangers!

9 REFERENCES

AHLSTRAND, C., DELLVE, L., EKMAN, A., JONSSON, A., AHLSTROM, L. & HAGBERG, M. 2009. Cutlery wiping performance test. *Pink report.* Göteborg: University of Gothenburg, Sahlgrenska Academy, Sahlgrenska miljömedicin.

AHLSTRAND, C., EKMAN, A., NOOR, A., ÅHLSTRÖM, L. & HAGBERG, M. 2012. Reliability of Purdue Pegboard® [Reliabilitetstestning av Purdue Pegboard® (finmotoriktest)]. Arbets- och miljömedicin, Sahlgrenska Universitetssjukhuset.

AHRBERG, Y., LANDSTAD, B. J., BERGROTH, A. & EKHOLM, J. 2010. Desire, longing and vanity: emotions behind successful return to work for women on long-term sick leave. *Work.,* 37(2):167-77.**,** 10.3233/WOR-2010-1067.

AIRILA, A., HAKANEN, J., PUNAKALLIO, A., LUSA, S. & LUUKKONEN, R. 2012. Is work engagement related to work ability beyond working conditions and lifestyle factors? *International Archives of Occupational and Environmental Health (E-pub)***,** 1-11.

AITKEN, L., GALLAGHER, R. & MADRONIO, C. 2003. Principles of recruitment and retention in clinical trials. *International journal of nursing practice,* 9**,** 338-46.

ALEXANDERSON, K. & HENSING, G. 2004. More and better research needed on sickness absence. *Scand J Public Health,* 32**,** 321-3.

ALEXANDERSON, K. & NORLUND, A. 2004. Swedish Council on Technology Assessment in Health Care (SBU). Chapter 12. Future need for research. *Scand J Public Health,* suppl 63**,** 256-8.

ALTMAN, D., SCHULZ, K., MOHER, D., EGGER, M., DAVIDOFF, F., ELBOURNE, D., GOTZSCHE, P. & LANG, T. 2001. The revised CONSORT statement for reporting randomized trials: explanation and elaboration. *Annals of Internal Medicine,* 134**,** 663 - 94.

ALTMAN, D. G. 1999. *Practical statistic for medical research,* London, Chapman & Hall.

AMICK, B., HABECK, R., OSSMANN, J., FOSSEL, A., KELLER, R. & KATZ, J. 2004. Predictors of successful work role functioning after carpal tunnel release surgery. *Journal of Occupational and Environmental Medicine,* 46**,** 490 - 500.

AMICK, B., LERNER, D., ROGERS, W., ROONEY, T. & KATZ, J. 2000. A review of health-related work outcome measures and their uses, and recommended measures. *Spine,* 25**,** 3152 - 60.

ARIENS, G. A., VAN MECHELEN, W., BONGERS, P. M., BOUTER, L. M. & VAN DER WAL, G. 2000. Physical risk factors for neck pain. *Scandinavian journal of work, environment & health***,** 7-19.

ASTVIK, W., MELLNER, C. & ARONSSON, G. 2006:3. På väg; En kvalitativ studie av långtidssjukskrivning, arbete och rörlighet. *Arbete och Hälsa.* Arbetslivsinstitutet.

BALINT, M. 1955. The doctor, his patient, and the illness. *Lancet,* 268**,** 683-8.

BENGTSSON, G., LÖNNBERG, A. & REIZENSTEIN 1994. *Etik och ekonomi i vården [Ethics and Economics within Health Care],* Stockholm, Sweden.

BERESFORD, P. 2011 *Supporting people: Towards a person-centred approach. ,* Bristol, The Policy Press.

BIRCHER, J. 2005. Towards a dynamic definition of health and disease. *Medicine, Health Care and Philosophy,* 8**,** 335-41.

BOHLE, P., PITTS, C. & QUINLAN, M. 2010. Time to call it quits? The safety and health of older workers. *International journal of health services,* 40**,** 23-41.

BORG, K., GOINE, H., SODERBERG, E., MARNETOFT, S. U. & ALEXANDERSON, K. 2006. Comparison of seven measures of sickness absence based on data from three counties in Sweden. *Work,* 26**,** 421-8.

BORG, K., HENSING, G. & ALEXANDERSON, K. 2001. Predictive factors for disability pension--an 11-year follow up of young persons on sick leave due to neck, shoulder, or back diagnoses. *Scand J Public Health,* 29**,** 104-12.

BOWLING, A. 2005. Just one question: If one question works, why ask several? *J Epidemiol Community Health,* 59**,** 342-5.

BROOKS, R. G., JENDTEG, S., LINDGREN, B., PERSSON, U. & BJORK, S. 1991. EuroQol: health-related quality of life measurement. Results of the Swedish questionnaire exercise. *Health Policy,* 18**,** 37-48.

CAMPBELL, M. J. & MACHIN, D. 1993. *Medical statistics: a commonsense approach,* Wiley New York.

CARROLL, C., RICK, J., PILGRIM, H., CAMERON, J. & HILLAGE, J. 2010. Workplace involvement improves return to work rates among employees with back pain on long-term sick leave: a systematic review of the effectiveness and cost-effectiveness of interventions. *Disability and rehabilitation,* 32**,** 607-21.

CHARMAZ, K. 2006. *Construction Grounded Theory. A practical guide through Qualitative Analysis.,* Great Brittain: London, Sage Publications.

CHEN, H. Y. & BOORE, J. R. 2009. Using a synthesised technique for grounded theory in nursing research. *J Clin Nurs,* 18**,** 2251-60.

CHIOVITTI, R. F. & PIRAN, N. 2003. Rigour and grounded theory research. *Journal of Advanced Nursing,* 44**,** 427-35.

COOMER, K. & HOUDMONT, J. 2013. Occupational health professionals' knowledge, understanding and use of work ability. *Occupational Medicine,* 63**,** 405-9.

COONEY, A. & COONEY, A. 2011. Rigour and grounded theory. *Nurse Researcher,* 18**,** 17-22.

CORBIN, J. & STRAUSS, A. 2008. *Basics of Qualitative Research 3e,* USA: Los Angeles, Sage Publication.

CORNELIUS, L. R., VAN DER KLINK, J. J., GROOTHOFF, J. W. & BROUWER, S. 2010. Prognostic Factors of Long Term Disability Due to Mental Disorders: A Systematic Review. *Journal of Occupational Rehabilitation*.

COSTA, G., SARTORI, S., BERTOLDO, B., OLIVATO, D., ANTONACCI, G., CIUFFA, V. & MAULI, F. Work ability in health care workers. International Congress Series, 2005. Elsevier, 264-9.

COTE, P., VAN DER VELDE, G., CASSIDY, J. D., CARROLL, L. J., HOGG-JOHNSON, S., HOLM, L. W., CARRAGEE, E. J., HALDEMAN, S., NORDIN, M., HURWITZ, E. L., GUZMAN, J., PELOSO, P. M., BONE, JOINT DECADE - TASK FORCE ON NECK, P. & ITS ASSOCIATED, D. 2008. The burden and determinants of neck pain in workers: results of the Bone and Joint Decade 2000-2010 Task Force on Neck Pain and Its Associated Disorders. *Spine,* 33**,** 60-74.

COVINSKY, K. E., PALMER, R. M., KRESEVIC, D. M., KAHANA, E., COUNSELL, S. R., FORTINSKY, R. H. & LANDEFELD, C. S. 1998. Improving functional outcomes in older patients: lessons from an acute care for elders unit. *Jt Comm J Qual Improv,* 24**,** 63-76.

CRESWELL, J. W. 2007. *Qualitative inquiry & research design, Choosing among five approaches,* London, Sage.

CUTCLIFFE, J. R. 2000. Methodological issues in grounded theory. *Journal of Advanced Nursing,* 31**,** 1476-84.

DE CROON, E. M., SLUITER, J. K., NIJSSEN, T. F., KAMMEIJER, M., DIJKMANS, B. A. C., LANKHORST, G. J. & FRINGS-DRESEN, M. H. W. 2005. Work ability of Dutch employees with rheumatoid arthritis. *Scand J Rheumatol,* 34**,** 277-83.

DE VRIES, H., BROUWER, S., GROOTHOFF, J., GEERTZEN, J. & RENEMAN, M. 2011. Staying at work with chronic nonspecific musculoskeletal pain: a qualitative study of workers' experiences. *BMC Musculoskeletal Disorders,* 12**,** 126.

DEKKERS-SANCHEZ, P. M., WIND, H., SLUITER, J. K. & FRINGS-DRESEN, M. H. W. 2011. What promotes sustained return to work of employees on long-term sick leave? Perspectives of vocational rehabilitation professionals. *Scandinavian Journal of Work Environment & Health,* 37**,** 481-93.

DEKKERS-SANCHEZ, P. M., WIND, H., SLUITER, J. K. & FRINGS-DRESEN, M. H. W. 2013. What factors are most relevant to the assessment of work ability of employees on long-term sick leave? The physicians' perspective. *International Archives of Occupational and Environmental Health,* 86**,** 509-18.

DELLVE, L., KARLBERG, C., ALLEBECK, P., HERLOFF, B. & HAGBERG, M. 2006. Macro-organizational factors, the incidence of work disability, and work ability among the total workforce of home care workers in Sweden. *Scand J Public Health,* 34**,** 17-25.

DOPFER, K., FOSTER, J. & POTTS, J. 2004. Micro-meso-macro. *Journal of Evolutionary Economics,* 14**,** 263-79.

EKBLADH, E. 2008. *Return to Work, Assessment of Subjective Psychosocial and Enviromental Factors.* PhD, Linköping University.

EKMAN, I., EHNFORS, M. & NORBERG, A. 2000. The meaning of living with severe chronic heart failure as narrated by elderly people. *Scand J Caring Sci,* 14**,** 130-6.

EKMAN, I., KJORK, E. & ANDERSSON, B. 2007. Self-assessed symptoms in chronic heart failure--important information for clinical management. *Eur J Heart Fail,* 9**,** 424-8.

EL FASSI, M., BOCQUET, V., MAJERY, N., LAIR, M. L., COUFFIGNAL, S. & MAIRIAUX, P. 2013. Work ability assessment in a worker population: comparison and determinants of Work Ability Index and Work Ability score. *Bmc Public Health,* 13.

ELFERING, A. 2006. Work-related outcome assessment instruments. *European Spine Journal,* 15**,** S32-S43.

ELLIOTT, N. & JORDAN, J. 2010. Practical strategies to avoid the pitfalls in grounded theory research. *Nurse Researcher,* 17**,** 29-40.

ELO, A. L., LEPPANEN, A. & JAHKOLA, A. 2003. Validity of a single-item measure of stress symptoms. *Scand J Work Environ Health,* 29**,** 444-51.

FADYL, J. K., MCPHERSON, K. M., SCHLÜTER, P. J. & TURNER-STOKES, L. 2010. Factors contributing to work-ability for injured workers: literature review and comparison with available measures. *Disability and Rehabilitation,* 32**,** 1173-83.

FALKDAL, A. H., EDLUND, C. & DAHLGREN, L. 2006. Experiences within the process of sick leave. *Scand J Occup Ther,* 13**,** 170-82.

FALKENBERG, A., NYFJALL, M., BILDT, C. & VINGARD, E. 2009. Predicting Sickness Absence-Are Extended Health Check-ups of Any Value? Comparisons of Three Individual Risk Models. *Journal of Occupational and Environmental Medicine,* 51**,** 104-11.

FEJER, R., KYVIK, K. O. & HARTVIGSEN, J. 2006. The prevalence of neck pain in the world population: a systematic critical review of the literature. *European spine journal,* 15**,** 834-48.

FITZMAURICE, G., LAIRD, N. & WARE, J. 2004. *Applied Longitudinal analysis,* New Yearsy, John Wiley & Sons.

FORSMAN, B. 1997. *Forskningsetik [Research Ethics],* Sweden, Studentlitteratur.

FRANCHE, R.-L., CULLEN, K., CLARKE, J., IRVIN, E., SINCLAIR, S. & FRANK, J. 2005. Workplace-Based Return-to-Work Interventions: A

Systematic Review of the Quantitative Literature. *J Occup Rehabil,* 15**,** 607-31.

GABBAY, M., TAYLOR, L., SHEPPARD, L., HILLAGE, J., BAMBRA, C., FORD, F., PREECE, R., TASKE, N. & KELLY, M. P. 2011. NICE guidance on long-term sickness and incapacity. *British Journal of General Practice,* 61**,** 118-24.

GANDEVIA, B. & TOVELL, A. 1964. Declaration of Helsinki. *The Medical journal of Australia,* 2**,** 320-1.

GARD, G. & SANDBERG, A. C. 1998. Motivating factors for return to work. *Physiother Res Int,* 3**,** 100-8.

GARD, G. & SODERBERG, S. 2004. How can a work rehabilitation process be improved?--a qualitative study from the perspective of social insurance officers. *Disability and Rehabilitation,* 26**,** 299-305.

GERNER, U. 2005. *The persons on sick leave in the rehabilitation process: obstacles and possibilities [De sjukskrivna i rehabiliterings-processen: hinder och möjligheter]*. PhD, Stockholms University.

GILWORTH, G., CAREY, A., EYRES, S., SLOAN, J., RAINFORD, B., BODENHAM, D., NEUMANN, V. & TENNANT, A. 2006. Screening for job loss: development of a work instability scale for traumatic brain injury. *Brain Injury,* 20**,** 835-43.

GILWORTH, G., EMERY, P., GOSSEC, L., VLIELAND, T. V., BREEDVELD, F., HUEBER, A., SCHETT, G. & TENNANT, A. 2009. Adaptation and cross-cultural validation of the rheumatoid arthritis work instability scale (RA–WIS). *Annals of the rheumatic diseases,* 68**,** 1686-90.

GLASER, B. 1998. *Doing grounded theory-issues and discussions.,* Carlifornia, USA, Sociology Press.

GOULD, R., ILMARINEN, J., JÄRVISALO, J. & KOSKINEN, S. 2008. *Dimensions of work ability - Results of the Health 2000 Survey,* Waasa, Waasa Graphics.

HAGBERG, M., HARMS-RINGDAHL, K., NISELL, R. & HJELM, E. W. 2000. Rehabilitation of neck-shoulder pain in women industrial workers: a randomized trial comparing isometric shoulder endurance training with isometric shoulder strength training. *Arch Phys Med Rehabil,* 81**,** 1051-8.

HAINES, T., GROSS, A. R., BURNIE, S., GOLDSMITH, C. H., PERRY, L. & GRAHAM, N. 2009. A Cochrane review of patient education for neck pain. *The Spine Journal,* 9**,** 859-71.

HALLBERG, L. 2002. *Qualitative methods in public health research : theoretical foundations and practical examples,* Lund, Studentlitteratur.

HAMMELL, K. R. W. & IWAMA, M. K. 2012. Well-being and occupational rights: An imperative for critical occupational therapy. *Scandinavian journal of occupational therapy,* 19**,** 385-94.

HANSEN, A., EDLUND, C. & BRANHOLM, I. B. 2005. Significant resources needed for return to work after sick leave. *Work,* 25**,** 231-40.

HANSEN, A., EDLUND, G. & HENNINGSSON, M. 2006. Factors relevant to a return to work: A multivariate approach. *Work,* 26**,** 179-90.

HANSEN FALKDAL, A. 2005. Sjukskrivnas resurser och hinder för återgång i arbete. Viktiga faktorer för tidig bedömning. *Umeå University Medical Dissertations,* No 979.

HANSSON, T. & JENSEN, I. 2004. Sickness absence due to back and neck disorders. *Scandinavian journal of public health,* 32**,** 109-51.

HAUGSTVEDT, K. T. S., HALLBERG, U., GRAFF-IVERSEN, S., SØRENSEN, M. & HAUGLI, L. 2011. Increased self-awareness in the process of returning to work. *Scandinavian Journal of Caring Sciences,* 25**,** 762-70.

HENSING, G., ALEXANDERSON, K., ALLEBECK, P. & BJURULF, P. 1998. How to measure sickness absence? Literature review and suggestion of five basic measures. *Scand J Soc Med,* 26**,** 133-44.

HERMENS, H. J. & HUTTEN, M. M. R. 2002. Muscle activation in chronic pain: its treatment using a new approach of myofeedback. *International Journal of Industrial Ergonomics,* 30**,** 325-336.

HEYMANS, M. W., DE VET, H. C., KNOL, D. L., BONGERS, P. M., KOES, B. W. & VAN MECHELEN, W. 2006. Workers' beliefs and expectations affect return to work over 12 months. *Journal of occupational rehabilitation,* 16**,** 685-95.

HOGG-JOHNSON, S., VAN DER VELDE, G., CARROLL, L. J., HOLM, L. W., CASSIDY, J. D., GUZMAN, J., COTE, P., HALDEMAN, S., AMMENDOLIA, C., CARRAGEE, E., HURWITZ, E., NORDIN, M. & PELOSO, P. 2008. The burden and determinants of neck pain in the general population - Results of the bone and joint decade 2000-2010 task force on neck pain and its associated disorders. *Spine,* 33**,** 39-51.

HOLLIDAY, R. C., CANO, S., FREEMAN, J. A. & PLAYFORD, E. D. 2007. Should patients participate in clinical decision making? An optimised balance block design controlled study of goal setting in a rehabilitation unit. *J Neurol Neurosurg Psychiatry,* 78**,** 576-80.

HOLM, L. W., CARROLL, L. J., CASSIDY, J. D., HOGG-JOHNSON, S., COTE, P., GUZMAN, J., PELOSO, P., NORDIN, M., HURWITZ, E., VAN DER VELDE, G., CARRAGEE, E. & HALDEMAN, S. 2008. The burden and determinants of neck pain in whiplash-associated disorders after traffic collisions - Results of the bone and joint decade 2000-2010 task force on neck pain and its associated disorders. *Spine,* 33**,** 52-9.

HOLMGREN, K. 2008. *Work-related stress in women-Assessment, prevalence and return to work.* PhD, University of Gothenburg.

HOLMGREN, K. & DAHLIN IVANOFF, S. 2004. Women on sickness absence--views of possibilities and obstacles for returning to work. A focus group study. *Disabil Rehabil,* 26**,** 213-22.

HUBER, M., KNOTTNERUS, J. A., GREEN, L., VAN DER HORST, H., JADAD, A. R., KROMHOUT, D., LEONARD, B., LORIG, K., LOUREIRO, M. I., VAN DER MEER, J. W. M., SCHNABEL, P., SMITH, R., VAN WEEL, C. & SMID, H. 2011. How should we define health? *British Medical Journal,* 343**,** 1-3.

HULTIN, H., HALLQVIST, J., ALEXANDERSON, K., JOHANSSON, G., LINDHOLM, C., LUNDBERG, I. & MOLLER, J. 2010. Low level of adjustment latitude--a risk factor for sickness absence. *European journal of public health,* 20**,** 682-8.

HÄGG, G. M. & ÅSTRÖM, A. 1997. Load pattern and pressure pain threshold in the upper trapezius muscle and psychosocial factors in medical secretaries with and without shoulder/neck disorders. *International archives of occupational and environmental health,* 69**,** 423-32.

IGHE, E.-L. & LIDWALL, U. 2010. Long-term sick [Långtidssjukskrivna]. *Social Insurance Report.* Stockholm, Sweden.

ILMARINEN, J. 2005. *Towards a longer worklife; Ageing and the quality of worklife in the European Union,* Helsinki Finland, FIOH Bookstore.

ILMARINEN, J. 2007. The Work Ability Index (WAI). *Occup Med,* 57**,** 160.

ILMARINEN, J. 2009. Work ability-a comprehensive concept for occupational health research and prevention. *Scand J Work Environ Health,* 35**,** 1-5.

ILMARINEN, J. & TUOMI, K. Past, present and future of work ability. Proceedings of the 1st International Symposium on Work Ability, Helsinki, 2004.

INCORPORATED, S. I. 2004. SAS 9.1. *SAS/Stat user's guide, version 9.1.* Cary, NC, USA.

JANSSON, I. & BJORKLUND, A. 2007. The experience of returning to work. *Work,* 28**,** 121-34.

JOHANSSON, B. & VINGÅRD, E. 2012:4. Migration, work environment and health [Migration, arbetsmiljö och hälsa]. Uppsala Universitet, Sweden: Uppsala Akademiska Sjukhus.

JOHANSSON, C. & ISAKSSON, G. 2011. Experiences of participation in occupations of women on long-term sick leave. *Scandinavian Journal of Occupational Therapy,* 18**,** 294-301.

JOHANSSON, G. 2007. *The Illness Flexibility Model and Sicknes Absence.* PhD, Karolinska Institutet.

JOHANSSON, G. & LUNDBERG, I. 2004. Adjustment latitude and attendance requirements as determinants of sickness absence or attendance. Empirical tests of the illness flexibility model. *Soc Sci Med,* 58**,** 1857-68.

JOHANSSON, G., LUNDBERG, O. & LUNDBERG, I. 2006. Return to work and adjustment latitude among employees on long-term sickness absence. *Journal of occupational rehabilitation,* 16**,** 185-95.

KARLSON, B., JONSSON, P., PALSSON, B., ABJORNSSON, G., MALMBERG, B., LARSSON, B. & OSTERBERG, K. 2010. Return to work after a workplace-oriented intervention for patients on sick-leave for burnout--a prospective controlled study. *BMC public health,* 10**,** 301.

KAUSTO, J., MIRANDA, H., MARTIMO, K. P. & VIIKARI-JUNTURA, E. 2008. Partial sick leave-review of its use, effects and feasibility in the Nordic countries. *Scand J Work Environ Health,* 34**,** 239-49.

KLANGHED, U., SVENSSON, T. & ALEXANDERSON, K. 2004. Positive encounters with rehabilitation professionals reported by persons with experience of sickness absence. *Work,* 22**,** 247-54.

KRISTENSEN, T. S., HANNERZ, H., HOGH, A. & BORG, V. 2005. The Copenhagen Psychosocial Questionnaire-a tool for the assessment and improvement of the psychosocial work environment. *Scand J Work Environ Health,* 31**,** 438-49.

KUOPPALA, J. & LAMMINPAA, A. 2008. Rehabilitation and work ability: a systematic literature review. *J Rehabil Med,* 40**,** 796-804.

KUOPPALA, J., LAMMINPAA, A. & HUSMAN, P. 2008. Work health promotion, job well-being, and sickness absences--a systematic review and meta-analysis. *Journal of Occupational and Environmental Medicine,* 50**,** 1216-27.

LANDSTAD, B., HEDLUND, M., WENDELBORG, C. & BRATAAS, H. 2009a. Long-term sick workers experience of professional support for re-integration back to work. *Work: A Journal of Prevention, Assessment and Rehabilitation,* 32**,** 39-48.

LANDSTAD, B. J., WENDELBORG, C. & HEDLUND, M. 2009b. Factors explaining return to work for long-term sick workers in Norway. *Disability and Rehabilitation,* 31**,** 1215-26.

LARSSON, T. J., NORMARK, M., WEIGELT, A., ÅHLGREN, M. & ÅKERSTRÖM, T. 2014. Serious Work Accidents and Long-term Sickness Absence [Allvarliga arbetsskador och långvarig sjukfrånvaro]–2014. *AFA Försäkring [Insurance]*. Stockholm, Sweden.

LAW, M., STEINWENDER, S. & LECLAIR, L. 1998. Occupation, health and well-being. *Canadian Journal of Occupational Therapy,* 65**,** 81-91.

LEIJON, M., HENSING, G. & ALEXANDERSON, K. 2004. Sickness absence due to musculoskeletal diagnoses: association with occupational gender segregation. *Scand J Public Health,* 32**,** 94-101.

LINDBERG, P., JOSEPHSON, M., ALFREDSSON, L. & VINGARD, E. 2006a. Promoting excellent work ability and preventing poor work

ability: the same determinants? Results from the Swedish HAKuL study. *Occup Environ Med,* 63**,** 113-20.

LINDBERG, P., VINGARD, E., JOSEPHSON, M. & ALFREDSSON, L. 2006b. Retaining the ability to work-associated factors at work. *Eur J Public Health,* 16**,** 470-5.

LINDEGÅRD, A. & GRUNDELL, L. O. 2005. *Styrketräning är kul!* Available Online: www.amm.se

LINTON, S. J. 2000. A review of psychological risk factors in back and neck pain. *Spine,* 25**,** 1148-56.

LOISEL, P., BUCHBINDER, R., HAZARD, R., KELLER, R., SCHEEL, I., VAN TULDER, M. & WEBSTER, B. 2005. Prevention of Work Disability Due to Musculoskeletal Disorders: The Challenge of Implementing Evidence. *Journal of Occupational Rehabilitation,* 15**,** 507-24.

LOISEL, P., DURAND, P., ABENHAIM, L., GOSSELIN, L., SIMARD, R., TURCOTTE, J. & ESDAILE, J. M. 1994. Management of occupational back pain: the Sherbrooke model. Results of a pilot and feasibility study. *Occupational and Environmental Medicine,* 51**,** 597-602.

LYNÖE, N., WESSEL, M., OLSSON, D., ALEXANDERSON, K. & HELGESSON, G. 2013. Does feeling respected influence return to work? Cross-sectional study on sick-listed patients' experiences of encounters with social insurance office staff. *BMC public health,* 13**,** 268.

LÖVE, J., HOLMGREN, K., TORÉN, K. & HENSING, G. 2012. Can work ability explain the social gradient in sickness absence: a study of a general population in Sweden. *BMC public health,* 12**,** 163.

MACKENZIE, E. J., DAMIANO, A., MILLER, T. & LUCHTER, S. 1996. The development of the functional capacity index. *Journal of Trauma-Injury, Infection, and Critical Care,* 41**,** 799-807.

MARTIMO, K.-P., VARONEN, H., HUSMAN, K. & VIIKARI-JUNTURA, E. 2007. Factors associated with self-assessed work ability. *Occupational medicine,* 57**,** 380-2.

MATHIASSEN, S. E., WINKEL, J. & HAGG, G. M. 1995. Normalization of surface EMG amplitude from the upper trapezius muscle in ergonomic studies - A review. *Journal of Electromyography and Kinesiology,* 5**,** 197-226.

MCCAMBRIDGE, J., KYPRI, K. & ELBOURNE, D. 2014. In randomization we trust? There are overlooked problems in experimenting with people in behavioral intervention trials. *Journal of Clinical Epidemiology,* 67**,** 247-53.

MCGHEE, G., MARLAND, G. R. & ATKINSON, J. 2007. Grounded theory research: literature reviewing and reflexivity. *J Adv Nurs,* 60**,** 334-42.

MEAD, N. & BOWER, P. 2000a. Measuring patient-centredness: a comparison of three observation-based instruments. *Patient Educ Couns,* 39**,** 71-80.

MEAD, N. & BOWER, P. 2000b. Patient-centredness: a conceptual framework and review of the empirical literature. *Soc Sci Med,* 51**,** 1087-110.

MELIN, R., FUGL-MEYER, K. S. & FUGL-MEYER, A. R. 2003. Life satisfaction in 18- to 64-year-old Swedes: in relation to education, employment situation, health and physical activity. *J Rehabil Med,* 35**,** 84-90.

MESSING, K., STOCK, S. & TISSOT, F. 2009. Should studies of risk factors for MSDs be stratified by gender? Lessons from analyses of musculoskeletal disorders among respondents to the 1998 Québec Health Survey. *Scand J Work Environ Health,* 35**,** 96-112.

NIEDHAMMER, I., CHASTANG, J.-F., SULTAN-TAÏEB, H., VERMEYLEN, G. & PARENT-THIRION, A. 2013. Psychosocial work factors and sickness absence in 31 countries in Europe. *The European Journal of Public Health,* 23**,** 622-9.

NIELSEN, M. L., RUGULIES, R., CHRISTENSEN, K. B., SMITH-HANSEN, L. & KRISTENSEN, T. S. 2006. Psychosocial work environment predictors of short and long spells of registered sickness absence during a 2-year follow up. *Journal of Occupational and Environmental Medicine,* 48**,** 591-8.

NILSING, E., SODERBERG, E., BERTERO, C. & OBERG, B. 2013. Primary healthcare professionals' experiences of the sick leave process: a focus group study in Sweden. *J Occup Rehabil,* 23**,** 450-61.

NILSING, E., SODERBERG, E. & OBERG, B. 2012. Sickness certificates in Sweden: did the new guidelines improve their quality? *Bmc Public Health,* 12**,** 907.

NILSING, E., SODERBERG, E. & OBERG, B. 2014. Sickness certificates: what information do they provide about rehabilitation? *Disabil Rehabil,* 36 (15), 1299-304.

NORDENFELT, L. 1986. Health and Disease - 2 Philosophical-Perspectives. *Journal of Epidemiology and Community Health,* 40**,** 281-4.

NORDENFELT, L. 2006. On health, ability and activity: comments on some basic notions in the ICF. *Disability and Rehabilitation,* 28**,** 1461-5.

NORDENFELT, L. 2008. *The Concept of Work Ability,* Bryssels, Belgium, P.I.E. Peter Lang.

NORDIN, M., CARRAGEE, E. J., HOGG-JOHNSON, S., WEINER, S. S., HURWITZ, E. L., PELOSO, P. M., GUZMAN, J., VAN DER VELDE, G., CARROLL, L. J., HOLM, L. W., COTE, P., CASSIDY, J. D. & HALDEMAN, S. 2008. Assessment of neck pain and its associated disorders - Results of the bone and joint decade 2000-

2010 task force on neck pain and its associated disorders. *Spine,* 33**,** 101-22.

NORDQVIST, C., HOLMQVIST, C. & ALEXANDERSON, K. 2003. Views of laypersons on the role employers play in return to work when sick-listed. *J Occup Rehabil,* 13**,** 11-20.

OECD 2012. *Gender Publication - Closing the Gender Gap: Act Now* OECD Publishing.

OKTAY, S. J. 2012. *Grounded Theory*, USA: New York, Oxford University Press.

ORGANISATION, W. H. 1994. Geneva: WHO.

PENNEY, W. & WELLARD, S. J. 2007. Hearing what older consumers say about participation in their care. *Int J Nurs Pract,* 13**,** 61-8.

POLIT, D. F. & BECK TATANO, C. 2004. *Nursing Research: principals and Methods*, Philadelphia, Lippincott Williams & Wilkins.

PRANSKY, G., GATCHEL, R., LINTON, S. J. & LOISEL, P. 2005. Improving return to work research. *J Occup Rehabil,* 15**,** 453-7.

PRANSKY, G., SHAW, W., LOISEL, P., HONG, Q. & DÉSORCY, B. 2010. Development and Validation of Competencies for Return to Work Coordinators. *Journal of Occupational Rehabilitation,* 20**,** 41-8.

PRUEKSARITANOND, S., TUBTIMTES, S., ASAVANICH, K. & TIEWTRANON, V. 2004. Type 2 diabetic patient-centered care. *J Med Assoc Thai,* 87**,** 345-52.

RABIN, R. & DE CHARRO, F. 2001. EQ-SD: a measure of health status from the EuroQol Group. Informa Healthcare.

REYES-ORTEGA, G., GUYONNET, S., OUSSET, P. J., NOURHASHEMI, F., VELLAS, B., ALBAREDE, J. L., DE GLIZEZINSKI, I., RIVIERE, D. & FITTEN, L. J. 1997. Weight loss in Alzheimer's disease and resting energy expenditure (REE), a preliminary report. *Journal of the American Geriatrics Society,* 45**,** 1414-5.

RICKHAM, P. P. 1964. Human Experimentation. Code of Ethics of the World Medical Association. Declaration of Helsinki. *British medical journal,* 2**,** 177.

RIKSFÖRSÄKRINGSVERKET 2006. Statistikrapport [Statistical report] – försäkringsstatistik: Sjuklöneperioden åren 2002–2004. *Försäkringsstatistik.*

ROELEN, C. A., VAN RHENEN, W., GROOTHOFF, J. W., VAN DER KLINK, J. J., BULTMANN, U. & HEYMANS, M. W. 2013. The development and validation of two prediction models to identify employees at risk of high sickness absence. *Eur J Public Health,* 23**,** 128-33.

ROELEN, C. A., VAN RHENEN, W., GROOTHOFF, J. W., VAN DER KLINK, J. J., TWISK, J. W. & HEYMANS, M. W. 2014. Work ability as prognostic risk marker of disability pension: single-item

work ability score versus multi-item work ability index. *Scandinavian Journal of Work Environment & Health,* 40**,** 428-31.
SANDQVIST, J. L. & HENRIKSSON, C. M. 2004. Work functioning: a conceptual framework. *Work,* 23**,** 147-57.
SANDSJÖ, L., MELIN, B., RISSÉN, D., DOHNS, I. & LUNDBERG, U. 2000. Trapezius muscle activity, neck and shoulder pain, and subjective experiences during monotonous work in women. *European journal of applied physiology,* 83**,** 235-8.
SAUNDERS, S. & NEDELEC, B. 2014. What work means to people with work disability: a scoping review. *Journal of occupational rehabilitation,* 24**,** 100-10.
SAVIKKO, A., ALEXANDERSON, K. & HENSING, G. 2001. Do mental health problems increase sickness absence due to other diseases? *Social psychiatry and psychiatric epidemiology,* 36**,** 310-6.
SCHONSTEIN, E., KENNY, D. T., KEATING, J. & KOES, B. W. 2003. Work conditioning, work hardening and functional restoration for workers with back and neck pain. *Cochrane Database Syst Rev,* 1.
SEING, I., STÅHL, C., NORDENFELT, L., BÜLOW, P. & EKBERG, K. 2012. Policy and Practice of Work Ability: A Negotiation of Responsibility in Organizing Return to Work. *Journal of Occupational Rehabilitation,* 22**,** 553-64.
SFS 1982:763. Health care law [Hälso och sjukvårdslagen).
SHAW, W., HONG, Q. N., PRANSKY, G. & LOISEL, P. 2008. A Literature Review Describing the Role of Return-to-Work Coordinators in Trial Programs and Interventions Designed to Prevent Workplace Disability. *J Occup Rehabil,* 18**,** 2-15.
SJOGREN-RONKA, T., OJANEN, M. T., LESKINEN, E. K., TMUSTALAMPI, S. & MALKIA, E. A. 2002. Physical and psychosocial prerequisites of functioning in relation to work ability and general subjective well-being among office workers. *Scand J Work Environ Health,* 28**,** 184 - 90.
SLEBUS, F. G., SLUITER, J. K., KUIJER, P. P., WILLEMS, J. H. & FRINGS-DRESEN, M. H. 2007. Work-ability evaluation: a piece of cake or a hard nut to crack? *Disabil Rehabil,* 29**,** 1295-300.
SLUITER, J. & FRINGS-DRESEN, M. 2008. Quality of life and illness perception in working and sick-listed chronic RSI patients. *Int Arch Occup Environ Health,* 81**,** 495-501.
SOU 2006:107. Fokus på åtgärder [Focus on actions]. *Statens Offentliga utredningar*. Stockholm.
STAHL, C., SVENSSON, T., PETERSSON, G. & EKBERG, K. 2009. The Work Ability Divide: Holistic and Reductionistic Approaches in Swedish Interdisciplinary Rehabilitation Teams. *Journal of Occupational Rehabilitation,* 19**,** 264-73.
STATTIN, M. 2005. Retirement on grounds of ill health. *Occupational and Environmental Medicine,* 62**,** 135-40.

STERUD, T. & JOHANESEN, H. A. 2014. Do work-related mechanical and psychosocial factors contribute to the social gradient in long-term sick leave: A prospective study of the general working population in Norway. *Scandinavian Journal of Public Health,* 42**,** 329-34.

STERUD, T., JOHANNESSEN, H. A. & TYNES, T. 2014. Work-related psychosocial and mechanical risk factors for neck/shoulder pain: a 3-year follow-up study of the general working population in Norway. *International Archives of Occupational and Environmental Health,* 87**,** 471-81.

STIKELEATHER, J. 2004. An older worker's decision to "push or protect self" following a work-related injury. *Work,* 22**,** 139-44.

STURESSON, M., EDLUND, C., FJELLMAN-WIKLUND, A., FALKDAL, A. H. & BERNSPÅNG, B. 2013. Work ability as obscure, complex and unique: Views of Swedish occupational therapists and physicians. *Work: A Journal of Prevention, Assessment and Rehabilitation,* 45**,** 117-28.

STÅHL, C., MÜSSENER, U. & SVENSSON, T. 2011. Sjukskrivningssytemet och dess aktörer - Efter införandet av rehabiliteringskedjan [The social security system and their stakeholders - After implementing the rehabilitation chain]. *In:* CENTRE, H. V. E. (ed.) *Working papers.* Linköping, Sweden.

STÅHL, C., SVENSSON, T., PETERSSON, G. & EKBERG, K. 2009. The work ability divide: holistic and reductionistic approaches in Swedish interdisciplinary rehabilitation teams. *Journal of occupational rehabilitation,* 19**,** 264-73.

STÅHL, C., SVENSSON, T., PETERSSON, G. & EKBERG, K. 2010. Swedish rehabilitation professionals' perspectives on work ability assessments in a changing sickness insurance system. *Disability and Rehabilitation,* 1-10.

SURESH, K. 2011. An overview of randomization techniques: An unbiased assessment of outcome in clinical research. *Journal of human reproductive sciences,* 4**,** 8.

TENGLAND, P. A. 2010. The Concept of Work Ability. *Journal of Occupational Rehabilitation,* 21**,** 275-285.

THE EuroQual GROUP. 1990. EuroQol-a new facility for the measurement of health-related quality of life.. *Health Policy,* 16**,** 199-208.

THORSEN, S. V., BURR, H., DIDERICHSEN, F. & BJORNER, J. B. 2013. A one-item workability measure mediates work demands, individual resources and health in the prediction of sickness absence. *International Archives of Occupational and Environmental Health,* 86**,** 755-66.

TORGEN, M. 2005. Experiences of WAI in a random sample of the Swedish working population. *International Congress Series,* 1280**,** 328-32.

TUOMI, K., ILMARINEN, J., JAHKOLA, A., KATAJARINNE, L. & TULKKI, A. 1998. *Work Ability Index,* Helsinki, Finland, K-print Oy Vantaa.

TVEITO, T. H., HYSING, M. & ERIKSEN, H. 2004. Low back pain interventions at the workplace: a systematic literature review. *Occup Med (Lond),* 54**,** 3-13.

VAHLEN WESTERHÄLL, L. (ed.) 2008. *Arbets(o)förmåga - Ur ett mång-disciplinärt perspektiv [Work (dis)ability - from a trans-disiplinary perspective],* Stockholm, Sweden: Santérus.

VAHLNE WESTERHÄLL, L., BERGROTH, A. & EKHOLM, J. 2009. *Rehabiliteringsvetenskap - Rehabilitering till arbetslivet i ett flerdisciplinärt perspektiv [Rehabilitation Science - Rehabilitation to work in a multi-disciplinary perspective],* Malmo, Sweden, Holmbergs.

WAHLSTRÖM, J., HAGBERG, M., TOOMINGAS, A. & TORNQVIST, E. W. 2004. Perceived muscular tension, job strain, physical exposure, and associations with neck pain among VDU users; a prospective cohort study. *Occupational and environmental medicine,* 61**,** 523-8.

WALLS, P., PARAHOO, K. & FLEMING, P. 2010. The role and place of knowledge and literature in grounded theory. *Nurse Res,* 17**,** 8-17.

VEIERSTED, K. B. & WESTGAARD, R. H. 1993. Development of trapezius myalgia among female workers performing light manual work. *Scand J Work Environ Health,* 19**,** 277-83.

VELOZO, C. A., KIELHOFNER, G., GERN, A., LIN, F.-L., AZHAR, F., LAI, J.-S. & FISHER, G. 1999. Worker Role Interview: Toward validation of a psychosocial work-related measure. *Journal of Occupational Rehabilitation,* 9**,** 153-68.

VELOZZO, C., KIELHOFNER, G. & FISHER, G. 1998. *A User's Guide to Worker Role Interview (WRI):(version 9.0),* Model of Human Occupation Clearinghouse, Department of Occupational Therapy, College of Applied Health Sciences, University of Illinois at Chicago.

WILLIAMS, R. M., WESTMORLAND, M. G., LIN, C. A., SCHMUCK, G. & CREEN, M. 2007. Effectiveness of workplace rehabilitation interventions in the treatment of work-related low back pain: a systematic review. *Disability and rehabilitation,* 29**,** 607-24.

VINGARD, E., LINDBERG, P., JOSEPHSON, M., VOSS, M., HEIJBEL, B. & ALFREDSSON, L. 2005. Long-term sick-listing among women in the public sector and its associations with age, social situation, lifestyle, and work factors: a three-year follow-up study. *Scand J Public Health,* 33**,** 370-5.

VINGÅRD, E., WALDENSTRÖM, M., BENGTSSON, F., SVARTENGREN, M., EKENVALL, L., AHLBERG, G. & GROUP, H.-S. 2007. Långtidssjukskrivning, rehabilitering och återgång i arbete - processer och resultat hos företag inom privat sektor,

Delstudie 4 [Long term sick-leave, rehabilitation and return to work - the processes and results of companies in the private sector, part 4]. Hälsa och Framtid Ett forskningsprojekt om långtidsfriska företag. Stockholms läns landsting: Karolinska Institutet Uppsala Universitet.

VON KORFF, M. & MIGLIORETTI, D. L. 2005. A prognostic approach to defining chronic pain. *Pain,* 117**,** 304-13.

VON KORFF, M., ORMEL, J., KEEFE, F. J. & DWORKIN, S. F. 1992. Grading the severity of chronic pain. *Pain,* 50**,** 133-49.

World Medical Association Declaration of Helsinki. 2001. Ethical principles for medical research involving human subjects. *Bulletin of the World Health Organization,* 79**,** 373-4.

WÅHLIN, C. 2012. The Rehabilitation Process for Individuals with Musculoskeletal and Mental Disorders: Evaluation of Health, Functioning, Work Ability and Return to Work.

YURDUSEV, A. N. 1993. 'Level of Analysis' and'Unit of Analysis': A Case for Distinction. *Millennium-Journal of International Studies,* 22**,** 77-88.