This study focused on factors that may promote work ability and health of unemployed people. The results showed that these can be promoted by addressing several individual, social, and work-related factors. Current state of health was predominant in unemployed people’s perceptions of their work ability. The study created a resource model that shows work ability as a part of overall wellbeing. Health-improving interventions should be further developed for the needs of unemployed job seekers.
THE WORK ABILITY AND HEALTH OF UNEMPLOYED PERSONS

FOCUSING ON PROMOTING FACTORS
Marja Hult

THE WORK ABILITY AND HEALTH OF UNEMPLOYED PERSONS

FOCUSING ON PROMOTING FACTORS

To be presented by permission of the Faculty of Health Sciences, University of Eastern Finland for public examination in CA100 Auditorium, Kuopio on 4 October, 2019, at 12 o’clock noon

Publications of the University of Eastern Finland
Dissertations in Health Sciences
No 525

University of Eastern Finland
Kuopio
2019
Author’s address: Department of Nursing Science
University of Eastern Finland
KUOPIO
FINLAND

Doctoral programme: Doctoral Programme in Health Sciences

Supervisors: Professor Terhi Saaranen, Ph.D.
Department of Nursing Science
University of Eastern Finland
KUOPIO
FINLAND

Professor (emerita) Anna-Maija Pietilä, Ph.D.
Department of Nursing Science
University of Eastern Finland
KUOPIO
FINLAND

Reviewers: Professor Marianna Virtanen, Ph.D.
Department of Public Health and Caring Sciences
Uppsala University
UPPSALA
SWEDEN

Adjunct professor Outi Kanste, Ph.D.
Research Unit of Nursing Science and Health Management
University of Oulu
OULU
FINLAND

Opponent: Professor Clas-Håkan Nygård, Ph.D.
Work Research Centre
Tampere University
TAMPERE
FINLAND
Work ability and health are worse in the unemployed population compared to employed people. Therefore, the purpose of this study was to focus on factors promoting the work ability and health of unemployed persons. The aims were to explore the factors associated with the work ability of unemployed persons, to examine the interrelations between the work ability, health, and employment status, and to assess the effectiveness of health interventions in improving re-employment.

This study consists of four sub-studies. Sub-studies I-III were cross-sectional population-based studies and sub-study IV was a systematic review and meta-analysis. Sub-study I explored the individual, social and work-related factors associated with work ability among unemployed people (n = 1,975) with regression analyses. Sub-study II was based on a structural equation modelling conducted among employed (n = 11,262) and unemployed (n = 1,467) people. Sub-study III created a resource model of the work ability of unemployed people (n = 1,975) using a path model analysis. Sub-study IV assessed the interventions reported in 13 RCT studies selected from 10 databases.

Health was the most significant factor associated with the work ability. The only health behaviour associated with work ability was physical activity among unemployed persons. The working-aged people who had good health, were more likely to have good work ability, and were also more often employed than unemployed. The work ability of unemployed people was part of their overall wellbeing and quality of life according to a resource model. Health-improving interventions based on group training and support improved re-employment, and the quality of the evidence was moderate. This study showed that the work ability and health of unemployed persons can be promoted by addressing several factors. Future research should examine work ability and re-employment among unemployed persons using longitudinal study designs.

National Library of Medicine Classification: W 85, WA 30, WA 590
Universal Decimal Classification: 331.5
Medical Subject Headings: Unemployment; Health Behavior; Health Promotion; Quality of Life; Exercise; Return to Work; Socioeconomic Factors; Work Capacity Evaluation
TIIVISTELMÄ

Työttömien työkyky ja terveys ovat heikompia kuin työssä käyvien ja siksi tässä tutkimuksessa keskittyään työkykyään ja terveyttä edistäviin tekijöihin. Tarkoituksena oli selvittää työttömien työkykyyn yhteydessä olevia tekijöitä, tarkastella työkyvyn, terveyden ja työllisyystilanteen välisiä suhteita sekä arvioida työttömille suunnattuja, työllistymistä edistäviä terveysinterventioita.

Tutkimus sisältää neljä osatutkimusta ja viisi alkuperäisjulkaisua. Osatutkimukset I–III olivat väestötason poikkileikkaustutkimuksia ja osatutkimus IV oli systemaattinen kirjallisuuskatsaus ja meta-analyysi. Osatutkimuksessa I selvitettiin työttömien (n=1975) työkykyyn yhteydessä olevia yksilöllisiä, sosiaalisia ja työhön liittyviä tekijöitä regressioanalyysilla (julkaisut I ja II). Osatutkimuksessa II työssä käyvien (n=11262) ja työttömien (n=1467) aineistoista rakennettiin työkyvyn, terveyden ja työllisyystilanteen keskinäisiä suhteita kuvaava rakenneyhtälömalli (julkaisu III). Työttömien (n=1975) työkyvyn resurssimalli luotiin rakenneyhtälömallina osatutkimuksessa III. Osatutkimuksessa IV arvioitiin 13 satunnaistettuja ja kontrolloituja interventiotutkimusta, jotka oli valittu 10 tietokannasta (julkaisut IV–V).

Tulosten mukaan terveys oli merkittävin työttömien työkykyyn yhteydessä oleva tekijä. Fyysinen aktiivisuus oli ainoa elintapetekijä, joka oli yhteydessä työttömien työkykyyn. Työikäisillä ihmisillä, joilla oli hyvä terveys, oli todennäköisemmin myös hyvä työkyky ja he olivat useammin työssä käyviä kuin työttömiä. Tutkimuksessa kehitetyn resurssimallin mukaisesti työttömien työkyky oli osa kokonaisvaltaista hyvinvointia ja elämänlaatua. Ryhmävalmennuksen ja tuken perustuvat interventiot lisäisivät työllistymistä työnhakijoiden keskuudessa meta-analyysissä, jonka näytön aste oli kohtuullinen. Tutkimus osoitti, että työttömien työkykyä ja terveyttä voidaan edistää useisiin tekijöihin vaikuttamalla. Tulevaisuudessa työttömien työkykyä ja työllistymistä tulisi tutkia seurantatutkimuksilla.

Luokitus: W 85, WA 30, WA 590

Yleinen suomalainen asiasanasto: työttömyys; työttömät; työkyky; työllistymisen; terveyden edistäminen; elämänlaatu; fyysinen aktiivisuus; sosioekonomiset tekijät
ACKNOWLEDGEMENTS

The present study was conducted in the Department of Nursing Science at the University of Eastern Finland in collaboration with the National Institute for Health and Welfare. I wish to thank several people for supporting me during this great opportunity and for contributing to the process.

First, I owe my deepest gratitude to my supervisors, Professor Terhi Saaranen and Professor Anna-Maija Pietilä, for their warm and intensive guidance and support during the research process. I was privileged to receive their endless encouragement and to have inspiring scientific discussions. I am also grateful to Research Manager Päivikki Koponen from the National Institute for Health and Welfare for her help with the data and for commenting manuscripts.

I thank the editors Jani Ruotsalainen and Jos Verbeek from the Cochrane Work group. Their kind and patient guidance throughout the review process was invaluable. I am grateful to my co-authors PhD Kirsi Lappalainen, Professor Kimmo Räsänen, Professor Christophe Vanroelen, and Professor Alex Burdorf for their top-level expertise and smooth co-operation.

I would like to thank the reviewers, Professor Marianna Virtanen and Adjunct Professor Outi Kanste, for their valuable and constructive comments on the thesis. I thank Elisa Wulff for the language revision of the thesis, James O’Connor for his kind help with the English language, and Matti Estola for statistical advice. I want to thank my fellow doctoral students for sharing this experience with me, and my friends for sharing their lives with me.

I would like to extend my sincerest thanks to my family for all support, and in particular to my mother and my mother-in-law for their practical help. To my dear husband, thank you – you made this project possible. I dedicate this dissertation to our three wonderful daughters.

I am grateful to following organisations for financial support: The Finnish Nursing Education Foundation, The Finnish Association of Nursing Research, and the Faculty of Health Sciences. I am deeply grateful to the Department of Nursing Science, where I have had the privilege of working as an early stage researcher with this thesis.

Helsinki, August 2019

Marja Hult
LIST OF ORIGINAL PUBLICATIONS

This dissertation is based on the following original publications:


III  Hult M, Pietilä A-M and Saaranen T. Improving employment opportunities of the unemployed by health and work ability promotion in Finland. *Health Promotion International*, 1-9, 2019


The publications were adapted with the permission of the copyright owners.
CONTENTS

ABSTRACT ................................................................................................................ 7
TIIVISTELMÄ ............................................................................................................. 9
ACKNOWLEDGEMENTS ........................................................................................11
1 INTRODUCTION .................................................................................................19
2 REVIEW OF THE LITERATURE ........................................................................21
  2.1 Work ability and unemployment .................................................................21
  2.1.1 Multidimensional and contextual nature of work ability .....................21
  2.1.2 The consequences of unemployment ....................................................24
  2.1.3 Evidence on the work ability of unemployed persons .......................26
  2.2 Resource-based theories and coping with unemployment ....................28
  2.2.1 Resource-based approach on unemployment ......................................28
  2.2.2 Salutogenesis and resistance resources .............................................29
  2.2.3 Conservation of resources .................................................................31
  2.3 Promoting employment by health interventions .......................................31
  2.3.1 Definition of health intervention .......................................................31
  2.3.2 Interventions for unemployed job seekers .........................................32
  2.4 Summary of the theoretical background ..................................................33
3 AIMS OF THE STUDY ........................................................................................36
4 DATA AND METHODS .......................................................................................37
  4.1 Study design and data ................................................................................37
  4.2 Cross-sectional studies ..............................................................................38
  4.2.1 Methods for sub-study I ...................................................................38
  4.2.2 Methods for sub-studies II and III ......................................................41
  4.3 Systematic review process (sub-study IV) ................................................43
5 RESULTS ............................................................................................................45
  5.1 Characteristics of unemployed participants .............................................45
  5.2 Individual, social and work-related factors (sub-study I) .........................45
  5.3 Health, work ability and employment (sub-study II) ..............................48
  5.4 Resource model of work ability (sub-study III) .......................................50
  5.5 Health interventions for unemployed people (sub-study IV) ...............51
  5.6 Summary of the results ..............................................................................53
6 DISCUSSION ......................................................................................................55
  6.1 Discussion of the study results .................................................................55
  6.1.1 Overview of the main results ............................................................55
  6.1.2 Promoting factors of work ability in unemployed persons .............55
  6.1.3 Work ability mediates the effect of health on employment .............62
  6.1.4 Interventions improving re-employment among job seekers ..........63
  6.2 Ethical considerations ..............................................................................65
  6.3 The reliability and validity of the study ...................................................66
7 CONCLUSIONS .......................................................... 70
  7.1 Conclusions from main findings ............................................ 70
  7.2 Recommendations for further research .................................. 71
REFERENCES .............................................................................. 72
APPENDICES ............................................................................... 89
## ABBREVIATIONS

<table>
<thead>
<tr>
<th>Abbreviation</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>ALMP</td>
<td>Active Labour Market Policy</td>
</tr>
<tr>
<td>RMSEA</td>
<td>Root Mean Square Error of Approximation</td>
</tr>
<tr>
<td>ATH</td>
<td>Regional Health and Well-being Study</td>
</tr>
<tr>
<td>RR</td>
<td>Risk Ratio</td>
</tr>
<tr>
<td>AUDIT-C</td>
<td>Alcohol Use Disorders Identification Test</td>
</tr>
<tr>
<td>SEM</td>
<td>Structural Equation Modelling</td>
</tr>
<tr>
<td>BMI</td>
<td>Body Mass Index</td>
</tr>
<tr>
<td>SOC</td>
<td>Sense of Coherence</td>
</tr>
<tr>
<td>CBA</td>
<td>Controlled Before-After</td>
</tr>
<tr>
<td>SRH</td>
<td>Self-Rated Health</td>
</tr>
<tr>
<td>CI</td>
<td>Confidence Interval</td>
</tr>
<tr>
<td>CFI</td>
<td>Comparative Fit Index</td>
</tr>
<tr>
<td>CI</td>
<td>Comparative Fit Index</td>
</tr>
<tr>
<td>TLI</td>
<td>Tucker-Lewis Index</td>
</tr>
<tr>
<td>COR</td>
<td>Conservation of Resources</td>
</tr>
<tr>
<td>WAI</td>
<td>Work Ability Index</td>
</tr>
<tr>
<td>ICHI</td>
<td>International Classification of Health Interventions</td>
</tr>
<tr>
<td>WAS</td>
<td>Work Ability Score</td>
</tr>
<tr>
<td>IPW</td>
<td>Inverse Probability Weighting</td>
</tr>
<tr>
<td>WHO</td>
<td>World Health Organisation</td>
</tr>
<tr>
<td>ITS</td>
<td>Interrupted Time Series</td>
</tr>
<tr>
<td>MHI-5</td>
<td>Mental Health Inventory</td>
</tr>
<tr>
<td>NFI</td>
<td>Normal Fit Index</td>
</tr>
<tr>
<td>OECD</td>
<td>Organisation for Economic Co-operation and Development</td>
</tr>
<tr>
<td>OR</td>
<td>Odds Ratio</td>
</tr>
<tr>
<td>QOL</td>
<td>Quality of Life</td>
</tr>
<tr>
<td>RCT</td>
<td>Randomized Controlled Trial</td>
</tr>
<tr>
<td>RevMan</td>
<td>Review Manager</td>
</tr>
</tbody>
</table>
1 INTRODUCTION

An average, a worker will face an unemployment period at least once during his or her working life, although many of these periods are optional and part of normal labour turnover. According to OECD, Finland and Sweden are countries with the most rapid re-employment rates, as nearly 90% of job seekers find a new job within a year. (OECD, 2018.) At the end of December 2018, there were 256,500 unemployed job seekers in Finland, nearly 40,000 people fewer than a year earlier (Ministry of Economic Affairs and Employment, 2019). While Finland’s unemployment rate has decreased since 2015 (see Appendix 1), only six countries in Europe, Spain, France, Croatia, Italy, Cyprus, and Latvia, had higher unemployment rates than Finland at the end of 2018 (Eurostat, 2019).

There is no single group of unemployed people. Short-term unemployment means the duration of unemployment up to one year. The long-term unemployed person has been without work for at least a year. Youth unemployment affects young people aged 15–24. The recent trend in unemployment in Finland is that although the number of unemployed persons has decreased, the share of people with long-term unemployment has increased and remained high (Appendix 1). In an effort to rise up to this challenge, in February 2019, Finland’s parliamentary groups reported that they were committed to promoting the work ability of the working age population, preventing unemployment from leading to long-term unemployment, and increasing the employability of those whose position in the labour market was poor (TEM & STM, 2019). In addition to a lack of work ability support, Finnish unemployment is characterised by a problem of compatibility (efficiency of matching). Unemployed job seekers do not have the qualifications or expertise that employers are seeking, or suitable jobs do not exist within a reasonable commute from those looking for employment (Pehkonen et al., 2018). Further, in areas with high unemployment, the value of housing is negligible, while in regions with more available jobs, housing is expensive. These factors probably influence the persistently high share of long-term unemployed persons in Finland.

Younger (around 20 years) and older (aged 55 and upwards) workers, those with less than secondary education, manual labourers, workers with low socioeconomic status, and employees in small companies are at the highest risk of becoming unemployed (OECD, 2019; Vaalavuo, 2016). It is probable that these groups, with the exception of the young employees, are also characterized by decreased health and work ability affecting their job displacements. Poor health as well as decreased work ability are strongly connected to unemployment, whether as a reason for becoming

---

1 Statistics Finland, 2019: An unemployed person is a person who is not in paid employment or work as an entrepreneur, has been looking for work actively in the last four weeks as an employee or entrepreneur and could start working within two weeks. Also, a person who is out of work and awaits the agreed work within three months is considered unemployed if he could start working within two weeks. A laid-off person who fulfils the above criteria is also regarded as unemployed.
unemployed or a consequence of it (e.g. McKee-Ryan et al., 2005). Work ability also weakens as an unemployment period lengthens, and a sharp drop in this occurs after a two-year period (Laiho et al., 2010). Indeed, a Finnish study showed that only 2% of people with long-term unemployment were able to work (Kerätär et al., 2010). Another study conducted among short-term and long-term unemployed participants found that 15% were unable to work (Kerätär et al., 2016). Nonetheless, good work ability is one of the most important individual factors in successful job seeking (McGonagle et al., 2015; Wagenaar et al., 2015). Finding a new job is beneficial to the unemployed person’s work ability, health, and quality of life (Carlier et al., 2013; Ferreira et al., 2015; Gebel & Voßemer, 2014; Schuring et al, 2011).

Work ability is a complex and multidimensional concept for which there is no single conclusive definition. Simply put, it refers to a balance between personal resources and work demands (Ilmarinen et al., 2008). In the context of unemployment, work ability could be defined as a lifelong dynamic process that covers sometimes rapid and unexpected trajectories in a person’s working career (Lederer et al., 2014). The work ability of unemployed people has been sparsely studied; however, some knowledge has been gathered on the risk factors of decreased work ability (Laiho et al., 2010; Lappalainen et al., 2017; Pensola et al., 2008; Szlachta et al., 2012). In recent years, interest in unemployment research related to the work ability has increased in Finland, but internationally, there has been little interest. Heikkinen (2016) and Kerätär (2018) studied clinical work ability assessments and the disability pension eligibility of unemployed persons. Romppainen (2018) assessed the effectiveness of two interventions aimed at improving the re-employment and health status of unemployed people. Lappalainen (2017) and Saikku (2018) evaluated administrative coordination and services targeted for unemployed clients. However, it is not yet known which factors influence the perceived good work ability of unemployed persons. Therefore, the aims of this study were to explore the factors associated with the work ability of unemployed persons, to examine the interrelations of work ability, health, and employment status, and to assess the effectiveness of health interventions in improving re-employment among the unemployed population.
2 REVIEW OF THE LITERATURE

2.1 WORK ABILITY AND UNEMPLOYMENT

2.1.1 Multidimensional and contextual nature of work ability

There is no uniform definition for the concept of work ability, a relational, contextual, and multidimensional entity. Work ability comprehensively reflects factors relating to the individual, work, social environment, and society. It is central to the disciplines related to work and rehabilitation, and particularly important from the point of view of health insurance. The concept of work ability has changed along with social development. The definition of work ability has shifted from a medical, disability-based perception to a multidimensional view based on the balance between work requirements and individual resources. (Ilmarinen et al., 2008; Kerätär et al., 2014; Lederer et al., 2014.)

The knowledge of factors affecting work ability and promotion of work ability was strongly developed in research conducted among ageing Finnish workers in the 1980s and 1990s (e.g. Nygård et al., 1991). In their review of the previously published definitions of the concept of work ability, Lederer et al. (2014) found that most researchers refer to above-mentioned studies, and more specifically to a study by Tuomi et al. (1991). According to Lederer et al. (2014) the definitions of work ability expand to the individual, organisational, and societal levels. Of these dimensions, individual factors are the most studied area, for instance, in the contexts of epidemiology and rehabilitation. Individual factors associated with work ability include sociodemographics, medical history, employment and disability history, physical and psychosocial factors related to work and several psychosocial factors unrelated to work. At the organisation level, the factors include the employee's relationship with rehabilitation agents, the work ability management and culture at the workplace, and the reconciliation of work and family life. At the societal level, work ability has been defined through work ability policy, labour market, aging workforce, and religious and cultural values. The studies exploring these areas have concluded that work ability is a life-length dynamic process, as a result of which work ability models should incorporate the concept of time. (Lederer et al., 2014.)

The concept of work ability has also been defined by Tengland (2011) in the context of Swedish working life and legislation. According to Tengland (2011), it is necessary to define work ability in two ways: for jobs needing special skills or training (specific work ability), and for tasks that most people would be able to perform after a brief orientation (basic standard competence). Ilmarinen et al. (2005) have considered whether a similar distinction should be made to the concept in Finland as well. Indeed, in practice, work ability is also defined in two ways in Finland: there is the professional definition related to health insurance, i.e. the ability of the individual to work assessed in relation to his or her present job. This means
that a worker who gets ill and is thereby prevented from engaging in his or her profession, is entitled to sickness benefits. On the other hand, in the context of pension insurance, the person’s ability to work is estimated in relation to the work he or she could be expected to reasonably perform. This happens when a worker applies, for instance, for disability pension. Accordingly, Järvikoski et al. (2018) in discussing work ability, the interest has, in fact, been in work disability, and work ability is often defined as a lack of disability. One example of disability-driven thinking has been found in the arena of work disability prevention by Loisel et al. (2005), which places a disabled worker into four systems: personal, health care, workplace, and legislative and insurance systems, all of which are affected by the surrounding cultural context.

**Work ability models**

Various models have been constructed to define and explain work ability. Work ability has been defined by a medical model that emphasizes health and functional capacity, by balance models that consider work ability as a balance between personal or work resources and work requirements, and more recently by multidimensional and integrated models (Häusser et al., 2010; Ilmarinen & Tuomi, 1992; Karasek & Theorell, 1990). The most cited model is perhaps the work ability house model created by Ilmarinen et al. (2005) at the Finnish Institute of Occupational Health.

Comprehensive models of work ability often share the factors affecting work ability at distinct levels ranging from personal to societal, or, in other words, from proximal such as family relations, to distant such as the global economy (Lederer et al., 2014). In models, the individual’s work ability is associated with, for example, professional skills, stress-tolerance and personality, sense of control, wellbeing at work, values related to work, and employability. Workplace factors include work organisation and division, organisational changes, working community, workload, job flexibility, job control, and development opportunities at work. At the macro-level, policies related to labour, education system, pension insurance and social security create the preconditions for work ability. (Ilmarinen et al., 2008.)

**Defining work ability of unemployed persons**

None of the above models is directly applicable to defining the work ability of unemployed persons. The assumptions about work do not necessarily affect unemployed people similarly as those who are employed. For example, as the time since the previous period of employment grows, work-related issues may be distorted. Nonetheless, in this study, it is believed that former employment plays an important role in unemployed persons’ perceptions of their work ability. This study expects the work ability of unemployed people to follow a conceptual model of work (dis)ability by Lederer et al. (2014). The factors affecting the work ability of unemployed people are divided into microlevel, mesolevel, and macrolevel. Microlevel contains individual aspects, personal attributes and conditions, and is labelled an individual level. Mesolevel, or environmental level, comprises the
dimensions of work, healthcare, insurance, and community. Macrolevel, also known as the societal level, includes the infrastructures, systems, and dynamics of a society. (Figure 1.)

**Societal level**

*Macroinfrastructures, systems, and societal dynamics*
- Politolegal: laws, structures, policies in education, health, labour, welfare
- Macroeconomic: macroeconomic situation, labour market dynamics, unemployment rate, technology, industry
- Sociodemographic: ageing of the population, working age shift, immigration trends
- Cultural: cultural values and norms, historical labour force battles

**Environmental level**

*Work (previous job)*
- Physical, mental, behavioural, emotional: biomechanical exposures, ergonomic conditions, stress, job autonomy, mental workload
- Social support, stigma
- Financial: job insecurity
- Organisational culture and climate: norms, leadership style

*Healthcare (physicians, psychologists, physiotherapists)*
- Physical, mental, behavioural, emotional: evaluation, aid, and services
- Vocational: rehabilitation, reorientation, training

*Insurance (case managers, rehabilitation specialists, medical staff, lawyers)*
- Financial: unemployment benefits, disability benefits
- Vocational: rehabilitation, reorientation, training
- Legal: claims evaluation, admissibility
- Social: social legitimization, aid and services, stigma
- Physical, mental, behavioural, emotional: evaluation, aid, and services

*Community (family, relatives, friends, neighbours)*
- Social support, stigma
- Financial support, dependants, financial obligations
- Physical, mental, behavioural, and emotional assistance and workload

**Individual level**

*Personal attributes and condition*
- Physical, mental, behavioural, emotional: health, coping, motivation, cognition
- Social: social and networking skills
- Demographic: age, gender, immigration
- Educational/vocational: skills, degrees, experience
- Cultural/symbolic: ethics, values, perceived social role
- Financial: salary, unemployment benefits

Figure 1. Conceptual model of work ability of the unemployed, modified from Lederer et al. (2014).
2.1.2 The consequences of unemployment

The relationship between unemployment and wellbeing is twofold; on one hand, strong evidence confirms that workers with decreased health are at risk of becoming unemployed (Porru et al., 2018; Van Rijn et al., 2014; Virtanen et al., 2013; Wagenaar et al., 2015) and once unemployed, they are less likely to succeed in finding re-employment (Nwaru et al., 2016). On the other hand, unemployment, especially when prolonged, has a detrimental effect on mental health and wellbeing (Gebel & Voßemer, 2014; Maier et al., 2006; McKee-Ryan et al., 2005; Paul & Moser, 2009). However, it is important to recognise the individuality and contextuality of the effects of unemployment that may be moderated by several factors. For instance, in countries with better unemployment benefits, the consequences of unemployment are less severe than in countries with lower or no benefits (Bergqvist et al., 2013; Tøge, 2016). This argument can be challenged by an opposing view that proposes that, in Protestant societies, which often supply the most substantial unemployment benefits, people are actually more hurt by unemployment than those living in other societies (van Hoorn & Maseland, 2013).

In addition, men have been found to suffer more from unemployment than women due to men’s role as breadwinners (van der Meer, 2014), and negative mood has been found to increase along with a decrease in educational level among married unemployed men (Gokce & Sharone, 2017). A recent study by Vahid Shahidi et al. (2018) revealed there to be growing inequalities in health and wellbeing between the employed and the unemployed population groups. The study proposed that several reasons underlined this development: increasing meritocracy leading to indirect selection based on aspects such as intelligence and cognitive ability, a widening gap in proximal risk factors, such as dietary behaviour and incomes between groups, and also decline in the social networks that could provide individuals with support and safety (Vahid Shahidi et al., 2018).

Evidence of the different effects of unemployment can also be found through distinct research methods. Large epidemiological studies can show average associations and causal relationships between unemployment and risk factors, while qualitative studies can bring light to the subjective experiences of unemployment. On average, it is known that unemployed persons have higher morbidity and die earlier than the employed population (e.g. McKee-Ryan et al., 2005). It is also possible to assess subjective psychological structures, such as self-esteem in survey studies with validated instruments (Huysse-Gaytandjieva et al., 2015). Qualitative data may produce more in-depth knowledge about people’s experiences of unemployment and reveal individual stories and coping strategies (Blustein et al., 2013). The emotional burden of unemployment seems to be the most difficult to handle; feelings of isolation, frustration, hopelessness, stigma, and loss of self-esteem increase negative emotions and have a detrimental effect on wellbeing (Blustein et al., 2013; Hiswåls et al., 2017; Hult et al., 2016). However, previous studies have also shown positive experiences of becoming unemployed. Some may even welcome unemployment after a burdensome period of employment and perceive that
unemployment gives them an opportunity to focus on their own health and wellbeing, and recovery. Some unemployed persons may use their unemployment period for training, education, and networking, and are able to perceive unemployment as an opportunity for growth. (Blustein et al., 2013; Hiswåls et al., 2017; Hult et al., 2016.)

Understanding the mechanisms of the harmful impacts of unemployment is necessary when considering the measures used in health and work ability promotion. One the most established of theories that explains the detrimental effects of unemployment on wellbeing is Jahoda’s latent deprivation theory (Jahoda, 1981). Jahoda proposed that besides the more obvious consequences, such as salary, unemployment has consequences that go beyond earning a living. These latent consequences of employment that an unemployed person is deprived of include time structure, social contacts, commitment to shared goals, personal status and identity, and regular activity (Jahoda, 1981). Although Jahoda’s theory originates from the 1930s, it has been thereafter widely applied in studies (e.g. Creed & Evans, 2002; Frasquilho et al., 2016; Gnambs et al., 2015; Paul & Batinic, 2010). While Jahoda was undoubtedly able to capture the most essential of the beneficial effects of employment, she later admitted the role of economic hardship on psychological impairment during unemployment (Jahoda, 1992). Paul and Batinic (2010) have also reported about the lower manifest (financial situation) and latent functions among the unemployed population compared to those in employment, and the associations of the functions with distress.

Given that the deprivation theory had previously only been studied in individualistic cultures, Gnambs et al. (2015) widened the perspective culturally, assuming that in more collectivistic societies, the most crucial factor would be a loss of a collective purpose instead of social status and financial benefits, in contrast with individualistic societies. Nevertheless, collective purpose was not found to play a bigger role in the decline in wellbeing in Japan compared to the United States. Instead, it was shown that the loss of personal status and financial deprivation were more strongly connected to a decrease in wellbeing in an individualistic society (the US). (Gnambs et al., 2015.) It is assumed, however, that in an individualistic society with minor support from family and relatives such as Finland, it is quite difficult for the unemployed people to achieve a status that could be considered equivalent to that of their employed counterparts (see Gnambs et al., 2015; Mikucka, 2014).

Recent studies have put focus on financial deprivation, along with psychosocial factors, as a major consequence of unemployment and the most important factor in declining wellbeing (Brydsten et al., 2018; Frasquilho et al., 2016; González-Marín et al., 2018; López del Amo González et al., 2018). Economic hardship has been found to potentially lead to a loss of self-esteem and social isolation. Jahoda (1981) argued that even a job with poor conditions is more beneficial for wellbeing than unemployment, and this argument has also been confirmed by more recent studies (Grün et al., 2010). Meanwhile, there is conflicting evidence indicating that the poor psychosocial quality of a new job can be even more harmful for mental wellbeing.
than remaining unemployed (Butterworth et al., 2011). Jahoda’s model has also been criticised for its assumptions regarding the heterogeneity and passivity of unemployed people. Furthermore, it has been suggested that latent functions could be replaced by other activities, such as voluntary work and participation in informal and formal networks and associations. (Nørup, 2019.) Huffman et al. (2015) have proposed that family support could serve as an important resource (see section 2.2.2., Hobfoll, 1989) that could provide and replace some latent benefits of work by providing an unemployed person with mandatory activities and a time structure. They found that, for those unemployed people who experienced high financial stress, the benefits brought by family support for their psychological wellbeing were bigger than for those who did not receive family support (Huffman et al., 2015).

Janlert and Hammarström (2009) tested several models which explain the relationship between unemployment and poor health: an economic deprivation model, lack of control model, locus of control model, stress model, social support model, work involvement model, and latent deprivation model. They found that the latent deprivation model was best at explaining the depression outcomes in a sample of unemployed individuals. The strongest predictors of a deprivation model they found were time-related, namely time structure and regular activities. The model that fared second best at explaining the relationship was the economic deprivation model. (Janlert & Hammarström, 2009.) Paul and Batinic (2010) also found that time structure was the most significant latent function that employed people had access to.

2.1.3 Evidence on the work ability of unemployed persons

A systematic literature search on unemployment and work ability was conducted in November 2018 (updated in March 2019) in the following databases: Cinahl, PsycINFO, PubMed, and Scopus. Studies published in English or Finnish which were available in full text were included. In order to obtain as comprehensive data as possible, no restrictions were set on dates of publication. Other studies were searched for using national databases Medic and Julkari. The search terms, records by databases and a related PRISMA flow diagram are presented in Appendix 2. According to the inclusion criteria of the present study, the studies were about unemployment or unemployed people and work ability. Only six peer-reviewed studies were found on the work ability of unemployed persons and additional two national research reports were included (Appendix 3). However, further searches produced additional studies that had examined the association of work ability and employment status (n = 10, Appendix 4) and studies on different patient groups who had lost their work ability and job due to health impairments (n = 16, Appendix 5). The studies on different patient groups were limited to cover the period 2000–2019.

The work ability of unemployed persons

Becoming unemployed with poor health and decreased work ability is one reason explaining poorer work ability among the unemployed population compared to their
employed counterparts (Pensola et al., 2008; Szlachta et al., 2012). Other is the detrimental effect of unemployment on work ability. After a two-year period of unemployment, a person’s work ability decreases significantly (Laiho et al., 2010) and, overall, both long-term unemployment as well as repeated periods of unemployment relate to poor work ability (Hult et al., 2017; Kerätär & Karjalainen, 2010; Lappalainen et al., 2017; Pensola et al., 2008; Szlachta et al., 2012). In a study reporting the assessments of work ability of unemployed people, over a quarter of the study participants were unable to work in the competitive labour market (Kerätär & Karjalainen, 2010). Another study of the assessments of long-term unemployed people found that 65% of the participants had a mental disorder that impaired their work ability. Moreover, going on a permanent disability pension was suggested for 37% of the participants. (Kerätär et al., 2016.)

In addition to the duration of unemployment, health impairments, distress, economic problems, and older age (Laiho et al., 2010; Szlachta et al., 2012; Vastamäki et al., 2014), decreased work ability was found to be associated with low level of education (Pensola et al., 2008), while an inverse relation was found between good work ability and a high level of education (Hult et al., 2017). As impaired work ability is associated with a low sense of coherence (Vastamäki et al., 2014), the finding that perceiving life as meaningful (one component of a person’s sense of coherence) is associated with good work ability is also understandable (Hult et al., 2017). Additionally, good quality of life has been found to be associated with good work ability (Hult et al., 2017), even though, presumably, work ability is one of the predictors of the quality of life. In turn, re-employment has been found to improve work ability, even to the same level as before the unemployment (Pensola et al., 2008). Appendix 3 presents studies on work ability of unemployed persons.

The association of work ability and employment status
Poor and declining work ability has been found to increase the risk of becoming unemployed (Bethge et al., 2018; Boissonneaut & de Beer, 2018; Lundin et al., 2016; Wagenaar et al., 2012; Wagenaar et al., 2015). According to earlier studies, poor work ability is associated with female gender, younger age, poor health, multisite pain, psychological distress, smoking, and binge drinking (Lee et al., 2017; Lundin et al., 2016; Viitanen et al., 2012). Moreover, blue-collar workers and those with adverse physical and psychosocial working conditions are at risk of unemployment caused by work ability loss (Lundin et al., 2016). Losing a job and work ability may lead to depression as a result of the financial and societal consequences of job loss (Lee et al., 2017). While there is opposing evidence in support of poor work ability not predicting unemployment, it nonetheless predicts retirement due to disability (Roelen et al., 2014). However, disability pension applications by unemployed persons with a total loss of work ability were more frequently rejected in the early 2000s compared to employed population (Ydreborg & Ekberg, 2004). After losing a job, those at the biggest risk for long-term unemployment include older persons and those in poor health (Wagenaar et al., 2015). In addition to feeling discriminated,
unemployed persons may lack opportunities promoting their work ability (van Egmond et al., 2015). All the studies reporting the association of work ability and employment status are presented in Appendix 4.

As described above, poor health is an important reason for decreased work ability. Several studies have reported the employment outcomes of diverse patient groups (Appendix 5). For example, cancer survivors have significantly increased risk of becoming unemployed, while, beyond factors related to treatment, lower education, female gender, and higher age predict non-employment (Dumas et al., 2016; Ho et al., 2018; Mehnert et al., 2011). Furthermore, people with depression and psychiatric symptoms are at risk for both short-term as well as long-term unemployment (Löve et al., 2016; Thielen et al., 2014; Wu et al., 2009). Among these individuals, low education, high physical job demands, chronic back pain, and current smoking predict unemployment (Thielen et al., 2014) and environmental factors, e.g. family support, were most important in maintaining employment (Wu et al., 2009). Those with poor work ability receiving sickness absence benefits for any reason had longer unemployment durations compared to those with good work ability (Bethge et al., 2018). Finally, in one study, the work ability of people with epilepsy with uncontrolled seizures was affected by education, cognitive and physical functions, the ability to cope with the disease, self-perceived ability to work, and the ability to cope with stress (Wo et al., 2015).

2.2 RESOURCE-BASED THEORIES AND COPING WITH UNEMPLOYMENT

2.2.1 Resource-based approach on unemployment

This study assumes that unemployment is one of the most stressful situations that people may face in developed countries. Stress related to unemployment consumes the person’s resources and weakens his or her mental health (McKee-Ryan et al., 2005; Paul & Moser, 2009). Recent research across Europe also strengthens the strong link between unemployment and stress that has been found to increase with advanced age, the length of unemployment, and the person’s level of education (Farré et al., 2018; Hiswåls et al., 2017; Nikoloski & Pechijareski, 2017). There are contradictory findings about the effects on mental health of the unemployment rate (McKee-Ryan et al., 2005; Nikoloski & Pechijareski, 2017) and the effect of unemployment benefits (McKee-Ryan et al., 2005; Paul & Moser, 2009). It is worth noticing that active job seeking has been found to be associated with higher levels of stress (Nikoloski & Pechijareski, 2017). Confronting recurrent disappointments in job seeking may thus be one of the reasons for deteriorating self-esteem and feelings of hopelessness (Hiswåls et al., 2017) experienced by unemployed people. Mediators between psychosocial stress of unemployment and negative health outcomes include systemic inflammation (Hughes et al., 2017) and neuroendocrine consequences, e.g. cortisol secretion (Dettenborn et al., 2010; Gallagher et al., 2016; Sumner & Callagher, 2017). The finding concerning inflammation also explains the higher cardiovascular
risk for the unemployed population compared to the employed population (Hughes et al., 2017).

It is important to understand mechanisms that could strengthen resources during unemployment, enabling people to maintain and promote good health as a central resource of their work ability. To gain understanding of these mechanisms, this study applies the salutogenic approach of Antonovsky (1988, 1996), which emphasizes meaningful life as the origin of good health, and the Conservation of Resources theory of Hobfoll (1989). These theories have potential for increasing the understanding of coping with the stress of unemployment and achieving better health and, further, better work ability. The conservation of resources (COR) theory by Hobfoll (1989) and the salutogenic approach by Antonovsky (1988) are interconnected through their emphasis on highlighting resources that aid increasing stress resistance.

The salutogenic approach is one of the theories used in the field of health promotion. Health promotion measures can be divided into three levels: primary, secondary, and tertiary (WHO, 2019). Primary prevention aims at reducing factors that may cause illness and disability and promoting factors that are protective to health. Secondary prevention aims at early detection of known risk factors or conditions to prevent an illness from progressing. Tertiary prevention aims at reducing the consequences of a diagnosed disease. A specific interest of this study is to address primary prevention by investigating those factors promoting the health and work ability of unemployed persons that are protective to health.

### 2.2.2 Salutogenesis and resistance resources

#### Health as a continuum

As this study is positioned in the health promotion field and applies the salutogenic approach, it defines health by the measures of salutogenesis. Salutogenesis means the origins of health and the salutogenic approach intends to find an answer to the question of how people manage to stay healthy. The health continuum model of salutogenic paradigm was created by Antonovsky (1980, 1988) to fill the gaps of clinical (pathology) and public health (epidemiology) models. According to Antonovsky, the main weakness of these models in conceptualising health was caused by their dichotomy; perceiving people as either healthy or ill. By contrast, in salutogenesis, a person’s current health is located somewhere on an ease/dis-ease continuum. Antonovsky proposes that this location could be further studied with a multidimensional mapping sentence technique. However, the present study focuses on factors that allow a transition to the ease end of the continuum. These factors that help resisting multiple stressors, which will be discussed later in this thesis. Stressors are omnipresent and the human organism responds to a stressor by a state of tension. (Antonovsky 1980, 1988.) Successful tension management and coping with stressors becomes possible when a person learns to mobilise his or her resources (Mittelmark and Bauer, 2017). How effectively an individual can use the resources depends on his or her level of sense of coherence.
Sense of coherence
The concept of the sense of coherence (SOC) is one of the central elements of the salutogenic model of health. It means that the predictability and meaningfulness of internal and external life events creates enduring confidence. Three components, comprehensibility, manageability, and meaningfulness constitute a sense of coherence. Comprehensibility refers to a cognitive capacity to perceive internal and external stimulation as organised, consistent and structured. Manageability is a belief of one’s resources and their availability. Meaningfulness stands for a motivational element that helps one to perceive demands as worthy of investment and engagement. When a person has a feeling of having enough mobilizable resources to resist stressors, his or her sense of coherence is strengthened. A move towards the ‘health ease’ end of the ease/dis-ease continuum is enabled by a strong sense of coherence. (Antonovsky 1988, 1996.)

Generalized resistance resources
Generalized resistance resources are personal, group or community level characteristics that an individual can mobilize to cope with stressors. These resources vary by nature, and include material resources, knowledge and intelligence, ego identity, coping strategies, social support, commitment and cohesion with culture, cultural stability, ritualistic activities, religion and philosophy, preventive health orientation, genetic and constitutional general resistance resources, and a person’s state of mind. Resources are generated by life experiences and contribute to the individual’s level of a sense of coherence. The impact of resources on the person’s location on a health continuum is apparent as those who are at the ease end have balanced life experiences and have an opportunity to take part in decision-making. (Antonovsky 1980, 1988; Idan et al., 2017.)

Salutogenesis and unemployment
Unemployment often leads to unbalanced life situations in families and decreased possibilities for the unemployed person to take part in decision-making. Studies that have considered demographic resources show that father’s unemployment, low parental level of education, and the parents’ illness and divorce contribute to lower levels of sense of coherence in young people (Madarasova Geckova et al., 2010; Ristikari et al., 2008). By contrast, a good economic status of family contributes to higher levels of sense of coherence (García Moya et al., 2012; Madarasova Geckova et al., 2010). Girls who had a weak sense of coherence were at an increased risk of becoming unemployed in the future (Würtz et al., 2015). Whether a cause or a consequence, unemployed persons have lower SOC scores compared to the employed, and furthermore, low sense of coherence is associated with poor work ability among unemployed people (Feldt et al., 2005; Vastamäki et al., 2014). Furthermore, the sense of coherence has been found to mediate the effect of poor work ability on psychological wellbeing (Vastamäki et al., 2014). Unemployed people who had high sense of coherence were also more likely to find a new job compared
to those with poor SOC in a study by Vastamäki et al. (2011). The study made a positive finding that a person’s SOC could be reinforced by a supportive intervention (Vastamäki et al., 2009).

### 2.2.3 Conservation of resources

The conservation of resources (COR) theory of Hobfoll (1989) builds on an assumption that “people strive to retain, protect, and build resources and that what is threatening to them is the potential or actual loss of these valued resources” (Hobfoll, 1989). Gaining and maintaining resources generates wellbeing and, correspondingly, loss of resources leads to stress. When people lose resources, they aim to replace them by other resources; for instance, in the case of a job loss, people try and find a new one. Furthermore, indirect means or symbolic replacement may replace a loss. For example, an unemployed person might do this by engaging in activities that are similar to work.

Hobfoll (1989) includes four kinds of resources in his theory: object resources that are related to socioeconomic status; conditions (e.g. marriage, social relationships, employment); personal characteristics that aid stress resistance; and energy that aids acquiring other kinds of resources. Hobfoll (1989) links his personal characteristics to Antonovsky’s general resistance resources. Both theories emphasize the importance of a person’s orientation to the world and how he or she carves meaning in it.

Some studies have assessed wellbeing during unemployment in light of the COR theory. In their study conducted among unemployed job seekers, Lim et al. (2016) found that psychological capital increased wellbeing by reducing the fatigue caused by job search. Experienced meaningfulness may thus build and strengthen psychological resources, such as hope and optimism (Lim et al., 2016). An example of a gain cycle is shown by Vanhercke et al. (2015) who found that increasing perceived employability among workers was associated with better wellbeing. Loss cycles in turn, explain deterioration of health and work ability during unemployment (Hobfoll, 1989; Vanhercke et al., 2015). According Hobfoll (1989), people who lack resources are vulnerable to facing more losses. Losing a job and facing financial difficulties generates one probable loss cycle. In turn, the scarcity of money resulting from this can make it difficult for the person to maintain a healthy lifestyle and lead to a risk of disease.

### 2.3 PROMOTING EMPLOYMENT BY HEALTH INTERVENTIONS

#### 2.3.1 Definition of health intervention

Health interventions are important health promotion measures organized, for the most part, by a large health care sector. Health promotion targets people’s empowerment in an aim to allow them to take control of their own health (WHO, 1986). The WHO has created a comprehensive system for the definition and
classification of health interventions for statistical and reimbursement purposes (Zaiss, 2018). This International Classification of Health Interventions (ICHI, 2018) defines interventions based on their multidimensionality, by their target, action, or means. The targets of health interventions include body systems and functions which are divided into 12 systems, activities and participation domains, the environment, and health-related behaviours. The activities and participation domains include learning and applying knowledge, communication, mobility, self-care, interpersonal interactions and relationships, and communal, social, and civic life. The interventions on the environment cover the areas of products and technology, attitudes, and services, systems, and policies. The interventions on health-related behaviours may target topics such as substance abuse and addictive behaviours, violence-related behaviours, and lifestyle-related behaviours.

When defining health interventions based on the actions they include, they can be classified as diagnostic, therapeutic, managing, and preventive interventions. The diagnostic methods include, for example, measurements, tests, monitoring, and interviewing. Therapeutics include a large variety of clinical treatments, but also techniques such as massage, advising, counselling, and emotional and practical support. The managing interventions provide, for instance, support and assistance to participants, and working together and cooperating with a participant, health providers and other relevant stakeholders. Preventing interventions lean on actions, such as capacity building, raising awareness, public health monitoring, improving access to health services, and policy change. (ICHI, 2018.)

2.3.2 Interventions for unemployed job seekers

Most of the interventions offered to unemployed persons have the fairly obvious aim of enhancing job seeking and helping individuals in finding a new job. Active labour market policies (ALMPs) are the umbrella term for all the activities that a job seeker must pursue to be able to receive unemployment benefits. ALMPs concentrate on work-related skills and have little to no effect on the health and wellbeing, or life satisfaction, of job seekers (Sage, 2015; Wulfgramm, 2014). A recent study showed that increased expenditure on ALMPs was associated with a decrease in health and wellbeing among the unemployed (Voßemer et al., 2018). The term ‘passive labour market policy’ is used to define unemployment benefits, and in countries where benefits are generous, the wellbeing of unemployed people is better compared to countries with scarce benefits (Wulfgramm, 2014). Given that the health and work ability of the unemployed population are decreased, it is reasonable to provide to job seekers health-improving interventions that may also enhance their chances of finding employment. Health interventions may lower the barriers caused by poor health in looking for and applying for jobs. Re-employment has been found to improve the general and mental health as well as the quality of life of unemployed persons (Schuring et al., 2011; Carlier et al., 2013; Ferreira et al., 2015; Gebel & Voßemer, 2014). Systematic reviews have assessed the effectiveness of mental health interventions, vocational interventions, and job search interventions on re-
employment and improved mental health among the unemployed (Audhoe et al., 2010; Koopman et al., 2017; Liu et al., 2014; Moore et al., 2017). Moreover, interventions and re-employment programmes aimed at unemployed people with severe mental illness have been reviewed in previous studies (Suijkerbuijk et al., 2017; van Rijn et al., 2016). Most health interventions for unemployed job seekers have exclusively focused on health outcomes without addressing the topic of re-employment. Therefore, there is a need to systematically assess the effects of general health-improving interventions that may promote re-employment among unemployed persons without a specific disease diagnosis.

2.4 SUMMARY OF THE THEORETICAL BACKGROUND

The most suitable model for defining the work ability of unemployed persons is the multilevel model adapted from Lederer et al. (2014). The association between health and unemployment is widely studied, while little research has been conducted on the work ability of unemployed persons. Earlier knowledge of the factors associated with the work ability of unemployed people is concerned with the risk factors that decrease work ability. Poor health typically leads to a work ability loss, in other words disability, which can be a reason for becoming unemployed. Re-employment is difficult or even impossible for unemployed persons with poor health and work ability. It would be important to gain knowledge about the protective factors that have potential for improving a person’s work ability. From a broader perspective, these protective factors can be important resources in coping with the stress of unemployment. Preventive and recuperative measures can be developed for unemployed job seekers in applying effective intervention methods. Strengthening resources could result in improving both work ability as well as chances for re-employment.

Figure 2 summarizes the theoretical background of this study. Earlier evidence on the work ability of unemployed people and the theoretical perspectives that are associated with good health and work ability, and better re-employment prospects are presented in the upper part of the figure (green background). Here, the salutogenic approach is presented as a central element of this study, because it emphasizes positive health and work ability through strengthening the resources of an unemployed person. Interventions provide one means to promote health and work ability, and to recognise, gain, and maintain one’s resources as described in the Conservation of Resources (COR) theory as well as facilitate coping during unemployment.

For its part, the lower part of the figure includes the factors and theories concerning potential weakening of work ability during unemployment that may lead to disability (blue background). COR describes how and why loss cycles are formed. Latent deprivation theory shows the detrimental effect of unemployment on wellbeing.
An all-encompassing perspective in this study is health promotion, and the figure shows how the levels of health promotion measures (primary, secondary, and tertiary) fit into the theoretical framework. As the figure shows, there is a need to recognise promoting factors of work ability during unemployment. Also, it is not known yet what kind of health-improving interventions have potential to promote the employment, health, and work ability of unemployed job seekers.
Figure 2. Theoretical framework of the study.
3 AIMS OF THE STUDY

The aims of this study were to explore the factors associated with the work ability of unemployed persons, to examine the interrelations of work ability, health, and employment status, and to assess the effectiveness of health interventions in improving re-employment among the unemployed population.

The specific research objectives were

1. to describe the perceived work ability of unemployed persons and explore the association between perceived good work ability and sociodemographic, work-related, and wellbeing factors in the unemployed population (sub-study I)

2. to explore the work ability and health behaviours of unemployed persons and examine the association between good work ability and health behaviours (sub-study I)

3. to examine relations between health, work ability, and employment status and analyse the associations of meaningfulness, social networks, and physical activity on health and work ability among employed and unemployed persons (sub-study II)

4. to create a model for the resources of work ability in unemployed persons based on the data and applied theories (sub-study III)

5. to assess the effectiveness of health-improving interventions for unemployed job seekers’ prospects for finding employment (sub-study IV).
4 DATA AND METHODS

4.1 STUDY DESIGN AND DATA

This study is comprised of cross-sectional quantitative sub-studies using several statistical analytic methods, and a systematic review and meta-analysis (Table 1). Quantitative studies were conducted in collaboration with the National Institute of Health and Welfare (THL) and the systematic review was carried out in cooperation with the Work Group of Cochrane Collaboration. The data for the quantitative studies were obtained from the Finnish Regional Health and Well-Being Study (ATH), which is an ongoing population-based survey (National FinSote Survey from 2017 onwards) administrated by the THL. The data collection started in 2009 and includes persons aged 20 years and upwards. This study used data collected between January 2014 and January 2015 by self-administrated questionnaires.

The participants (N = 76,000) were randomly selected from the National Population Registry. They were sent an invitation letter and could choose to participate by filling out a postal questionnaire or an online survey. A total of 30,598 people took part in the study, resulting in a response rate of 40.3%. The analysis of non-participants found that youngest men, compared to older men, were most likely to not participate. Non-response rates were also higher among unmarried men and people not speaking Finnish compared to married men and Finnish speakers. By contrast, people who had completed education higher than basic or vocational education were more likely to participate. (Härkänen et al., 2014.) At the time of data collection (January 2014–January 2015), the questionnaire included the following topics in addition to background information: living conditions, quality of life, working conditions and wellbeing, health, functional and working capacity, health behaviour, accidents and violence, and service use (THL, 2019b).

Sub-study I used responses from unemployed or laid-off participants (n = 1,975) aged between 20 to 65. Sub-study II (n = 12,729) included only full data from full-time employed (n = 11,262) and unemployed or laid-off persons (n = 1,467). Employment status was self-reported, consisting eight categories: full-time work, part-time work or part-time pension, old-age pension, disability pension or being a recipient of rehabilitation allowance, unemployed or laid off, on family leave or a stay-at-home parent, student, and other. Employment status is based on a concept of main type of activity which describes the economic activity of a person (Statistics Finland, 2019b). Sub-study III used data from 1,975 unemployed or laid-off participants for the resource model that was created for this summary. Sub-study IV compiled data retrieved from intervention studies from 10 databases in a systematic review. Table 1 summarises the study designs.
Table 1. Summary of study designs by sub studies

<table>
<thead>
<tr>
<th>Sub-study I</th>
<th>Sub-study II</th>
<th>Sub-study III</th>
<th>Sub-study IV</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Date</strong></td>
<td>2016-17</td>
<td>2018</td>
<td>2018</td>
</tr>
<tr>
<td><strong>Aim</strong></td>
<td>To explore the factors associated with work ability of unemployed persons.</td>
<td>To examine the interrelations of work ability, health, and employment status in working-aged people.</td>
<td>To create a model for resources of work ability in unemployed persons based on the data and applied theories.</td>
</tr>
<tr>
<td><strong>Design</strong></td>
<td>Cross-sectional population-based study</td>
<td>Cross-sectional population-based study</td>
<td>Cross-sectional population-based study</td>
</tr>
<tr>
<td><strong>Methods</strong></td>
<td>Logistic regression</td>
<td>Structural equation modelling</td>
<td>Structural equation modelling</td>
</tr>
<tr>
<td><strong>Participants</strong></td>
<td>Unemployed or laid-off persons (n = 1,975)</td>
<td>Full-time employed (n = 11,262) and unemployed or laid-off persons (n = 1,467)</td>
<td>Unemployed or laid-off persons (n = 1,975)</td>
</tr>
<tr>
<td><strong>Publications</strong></td>
<td>Original publications I and II</td>
<td>Original publication III</td>
<td>Results are reported in this summary part of the thesis</td>
</tr>
</tbody>
</table>

4.2 CROSS-SECTIONAL STUDIES

4.2.1 Methods for sub-study I

**Study variables**
The outcome variable in sub-study I was good self-perceived work ability which was measured as the Work Ability Score (WAS) on a scale from 0 to 10. It is a single question of a person’s own evaluation of his or her current work ability compared to the best during the person’s lifetime. WAS is the first part of the seven-item Work Ability Index (WAI) that is widely used in clinical examinations and surveys. WAI was developed by a group of researchers led by Ilmarinen (2005) of the Finnish Institute of Occupational Health. WAS has been found to be as reliable as the more...
comprehensive WAI (El Fassi et al., 2013), evaluating work ability as part of health-related quality of life (Ahlstrom et al., 2010). It has been shown that a subjective estimate is a good predictor of the person’s future work ability and disability (Ahlstrom et al., 2010). In this study, work ability was good when the score was eight or above (El Fassi et al., 2013).

Sub-study I (original publications I and II) assessed four groups of variables: sociodemographic, work-related, factors related to wellbeing (original publication I), and health behaviours (original publication II). Sociodemographic variables were age, gender, marital status, having children under 18 living in the household, the length of education, and duration of unemployment. Work-related factors were assessed concerning the most recent job. These included employment status, such as wage or salary earner, physical and mental strain at work, and job satisfaction. Wellbeing variables were self-rated health (SRH), mental health, and quality of life. Mental health was assessed with the Mental Health Inventory (MHI-5) instrument which is used to screen depression and anxiety disorders (Cuijpers et al., 2009). Quality of life was measured with EuroHis-QOL instrument consisting of eight items: overall quality of life, satisfaction with health, daily activities, self-esteem, personal relationships, living conditions, energy, and economic resources (da Rocha et al., 2012).

Further, sub-study I (original publication II) applied sociodemographic variables and health behaviour variables. The sociodemographic variables included in this study were age, gender, marital status, having children under 18 living in the household, length of education, living environment, and duration of unemployment. The health behaviours included the person’s body mass index, daily smoking, alcohol consumption, vegetable consumption, participation in health promotion groups, physical exercise, and sitting during leisure time. Alcohol consumption was assessed with the three-item AUDIT-C scale from 0 to 12 points. This study used three points for women and four points for men as cut-offs for risk level alcohol use (Frank et al., 2008). AUDIT-C is a shortened version of 10-item full questionnaire; however, it is found as reliable as the full AUDIT (Jeong et al., 2017). Table 2 summarises variables used in sub-study I.

Statistical methods
The main statistical method used in sub-study I was binary logistic regression analysis, which allows the inclusion of several independent factors but permits only one outcome factor. Logistic regression applies an outcome variable that is dichotomized. The main advantage of logistic regression is that when all the variables are entered into the model together, confounding effects may be avoided. (Sperandei, 2014.) The outcome variable in sub-study I was good work ability (as opposed to limited work ability). Instead of studying risk factors, this study aimed at finding potential protective factors. Bivariate (the association of each independent variable and dependent variable only) and multivariate (combined effect of all the
variables in equation) logistic regression analyses were applied with 95% confidence intervals, reported as odds ratios (OR), and \( p < 0.05 \).

Moreover, sub-study I applied inverse probability weights (IPW) to take into account the stratified sampling design and the effect of non-response (Härkänen et al., 2014). Weights were based on a non-response analysis using register data on the respondents’ ages, gender, marital status, language, education, employment status, and geographical area. The data description used crude numbers and weighted frequencies. The first part of sub-study I initially detected the differences between genders with \( t \)-tests, but no major differences were found, so both genders were entered into the same analysis (original publication I). The second part of sub-study I involved first cross-tabulating health behaviours with sociodemographic variables using chi-squared tests (original publication II). The final regression model was adjusted for sociodemographic variables. Sub-study I was analysed using SPSS version 24.

Table 2. Summary of study variables and data analysis methods for sub-study I.

<table>
<thead>
<tr>
<th>Study variables</th>
<th>Scales / Number of items / Options</th>
<th>Data analyses</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Work ability</strong> (Work Ability Score WAS, 0–10) Good (≥8) / Limited (&lt;8)</td>
<td></td>
<td>( t )-test</td>
</tr>
<tr>
<td><strong>Sociodemographic variables</strong></td>
<td></td>
<td>Chi-squared test</td>
</tr>
<tr>
<td>• Age &lt;45 years / ≥45 years</td>
<td></td>
<td>Logistic regression (OR, 95% CI)</td>
</tr>
<tr>
<td>• Gender Male / Female</td>
<td></td>
<td>Nagelkerke ( R^2 )</td>
</tr>
<tr>
<td>• Marital status Married or cohabiting / Not married or cohabiting</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Children under 18 in a household Yes / No</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Education High (&gt;13 years) / Low (&lt;13 years)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Unemployment duration Short-term (≤12 months) / Long-term (&gt;12 months)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Living environment Urban / Rural</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Work-related variables</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Physical strain Low / Medium / High</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Mental strain Low / Medium / High</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Job satisfaction Satisfied / Not satisfied</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Wellbeing variables</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Self-rated health Good / Not good</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Mental Health (Mental Health Inventory MHI-5) Good / Poor</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Quality of life (EuroHis-QOL) Good / Not good</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Health behaviours</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Body Mass Index (BMI, kg/m²) Normal (&lt; 25) / Overweight (≥25)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Daily smoking No / Yes</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Alcohol consumption (AUDIT-C) No or moderate use / Risk level use</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Vegetable consumption 6–7 days a week / ≤5 days a week</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Health promotion groups Participated / Not participated</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Physical exercise High-intensity physical activity / Low physical activity</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Leisure time sitting 0–2 hours a day / ≥3 hours a day</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
4.2.2 Methods for sub-studies II and III

Study variables (sub-study II)
In sub-study II (original publication III), there were three outcome variables: employment status as employed or unemployed (single item), work ability, and self-rated health (SRH, single item). Work ability was a sum variable with three dimensions: work ability score (WAS), perceived work ability concerning the physical demands of work, and perceived work ability concerning the mental demands of work. Independent variables were meaningfulness, social networks, and physical activity. Meaningfulness was assessed with a single question on the extent to which the person feels that his or her life is meaningful. Social networks was a sum variable consisting of two items: satisfaction with personal relationships and social support, which was assessed with two variables: received emotional support and received instrumental support. Physical activity had two items: physical exercise and spending leisure time sitting down. (Table 3.)

Table 3. Summary of study variables and data analysis methods for sub-study II.

<table>
<thead>
<tr>
<th>Study variables</th>
<th>Scales / Number of items / Options</th>
<th>Data analyses</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age</td>
<td>Years</td>
<td>t-test</td>
</tr>
<tr>
<td>Gender</td>
<td>Male / Female</td>
<td>Chi-squared test</td>
</tr>
<tr>
<td>Marital status</td>
<td>Married or cohabiting / Not married or cohabiting</td>
<td>Pearson’s rho</td>
</tr>
<tr>
<td>Employment status</td>
<td>Employed / Unemployed</td>
<td>Structural equation</td>
</tr>
<tr>
<td>Self-rated health</td>
<td>1–5</td>
<td>modelling</td>
</tr>
<tr>
<td>Work ability</td>
<td></td>
<td>Bootstrapping</td>
</tr>
<tr>
<td>• Work Ability Score, 0–10</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Work ability concerning physical demands, 1–5</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Work ability concerning mental demands, 1–5</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Meaningfulness</td>
<td>1–5</td>
<td></td>
</tr>
<tr>
<td>Social networks</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Social support, two items, sum 0–12</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Satisfaction with personal relationships, 1–5</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Physical activity</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Physical exercise, 1–3</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Leisure time spent sitting, h/day</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

The following hypotheses were set regarding the main outcomes:
1 a) Health is positively related to work ability and employment status.
1 b) Work ability is positively related to employment status.

The hypotheses concerning the explanatory factors were:
2 a) Meaningfulness is positively related to health and work ability.
2 b) Social networks is positively related to health and work ability.
2 c) Physical activity is positively related to health and work ability.
Variables of resource model (sub-study III)
The model of the work ability of unemployed persons was created and is presented in this summary section of the thesis. It was based on results from sub studies I–II and resource-based theories applied in the study, and therefore named as the resource model. No specific hypotheses were set, but the directions of associations were tested based on earlier findings and theoretical assumptions. Earlier research found a strong association between work ability and quality of life (Hult et al., 2017). A direction of this relation was not specified; however, it was expected that work ability has a positive relation to quality of life. Quality of life was the principal outcome, because it reflects the overall satisfaction and wellbeing in life (Schalock et al., 2016). The elements of the quality of life are part of individual and social resources that help an individual to cope with harmful stress factors (c.f. Antonovsky, 1980, 1988). These resources in the model were health, work ability, belief in working until retirement age, social support, physical activity, job satisfaction, and meaningfulness. Demographic variables age and education were considered as only exogenous variables in the model: in other words, they were not caused by another variable of model, but could nonetheless substantially contribute to the phenomena (Table 4).

Table 4. Summary of study variables and data analysis methods for sub-study III.

<table>
<thead>
<tr>
<th>Study variables</th>
<th>Scales / Number of items / Options</th>
<th>Data analyses</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age</td>
<td>Years</td>
<td>Pearson’s rho</td>
</tr>
<tr>
<td>Education</td>
<td>Years</td>
<td>Structural equation modelling</td>
</tr>
<tr>
<td>Unemployment length</td>
<td>Months</td>
<td></td>
</tr>
<tr>
<td>Social support</td>
<td>Sum 0–12, two items</td>
<td></td>
</tr>
<tr>
<td>Physical activity</td>
<td>High-intensity physical activity / Low physical activity</td>
<td></td>
</tr>
<tr>
<td>Job satisfaction</td>
<td>1–5</td>
<td></td>
</tr>
<tr>
<td>Meaningfulness</td>
<td>1–5</td>
<td></td>
</tr>
<tr>
<td>Self-rated health</td>
<td>1–5</td>
<td></td>
</tr>
<tr>
<td>Belief in working until retirement age</td>
<td>1–4</td>
<td></td>
</tr>
<tr>
<td>Work Ability Score</td>
<td>0–10</td>
<td></td>
</tr>
<tr>
<td>Quality of life</td>
<td>EuroHis-QOL, 8–40</td>
<td></td>
</tr>
</tbody>
</table>

Statistical methods (sub-study II and III)
Sub-study II (original publication III) and sub-study III (resource model) applied structural equation modelling (SEM) that is used to assess causal inferences (Pearl, 2005). SEM allows the inclusion of multiple outcomes and can detect direct and indirect effects of a complex net of variables. SEM includes five steps: specification, identification, estimation, testing of model fit, and re-specification (Bollen & Long, 1993). In a model specification step, a statement of a theoretical model is used as a set of structural equations or as a path diagram. The model is based on a theory and past
research in the field of a study. A chosen statistical program determines the identification of the model and estimates the model’s parameters. As this study used AMOS, also model fit was automatically calculated by the program. If the model fit is poor, re-specification is needed. (Bollen & Long, 1993.) In sub-study II, the only data that contained full responses concerning these variables was included in the study. Sub-study III (resource model) also used SEM, because it allows equations with several endogenous variables (Bollen & Long, 1993). An endogenous variable is caused by one or more variables in a model. It was assumed that work ability might not be the only outcome when assessing the relationships within a complex phenomenon. The used analysis method in these sub-studies was called path analysis, because it applied only to the observed variables. Group differences between the employed and unemployed participants were tested with chi-squared tests and t-tests (sub-study II). To justify good model fit, the following fit indices were used (Hooper et al., 2008): \( \chi^2(df) < 5, p>0.05, \) Normal Fit Index (NFI), Tucker-Lewis Index (TLI) and Comparative Fit Index (CFI) all > .95, and Root Mean Square Error of Approximation (RMSEA) <.06. Chi-squared test may also be non-significant because of a large sample size. The significance of direct, indirect, and total effects was tested using the bootstrapping method (number of samples = 13,000), with bias-corrected confidence intervals of 95% (sub-study II). Sub-study II and III used SPSS version 25 for their analysis and a structural equation modelling made with AMOS.

### 4.3 SYSTEMATIC REVIEW PROCESS (SUB-STUDY IV)

The Cochrane Collaboration review process was initiated with the proposal of a review topic for the corresponding Cochrane group (Work). In the proposition phase, an international and multidisciplinary review group was formed. The first author conceived the protocol, co-ordinated the process, performed the analyses, and wrote the protocol and the review. The other authors designed the protocol with the first author and commented the protocol and the review. The search strategies were designed with the help of information specialists. The study protocol and a final review were both structured and conceived with the RevMan (2014) program for systematic reviews. The protocol (Hult et al., 2018) as well as the review were peer-reviewed and published in the Cochrane Database of Systematic Reviews.

The aim of the review was to assess the effectiveness of health-improving interventions aiming at helping unemployed job seekers in finding employment. Primarily, RCT studies were included, but to maximise the evidence in case that RCTs were not feasible, a choice was made to also include controlled before-after (CBA) and interrupted time series (ITS) studies (Ijaz et al., 2014). Studies conducted with unemployed adults aged 16 or above who were not in paid employment but available to start work were included, while studies that focused on other groups than unemployed people or were limited to one patient group were excluded. Any type of interventions that improved health at the individual level were included and grouped according to their methods.
The primary outcome of the review was re-employment, while the secondary outcomes were health outcomes, such as general health status and work ability. Systematic literature search was conducted based on a search strategy developed with the aid of information specialists in 10 databases (see original publication IV). Studies were selected independently by two researchers using the review management programme, and any disagreements were solved through discussion. The selection process was recorded with the PRISMA study flow diagram (Moher et al., 2009). From the selected studies, the following data was extracted: methods, participants, interventions, outcomes, and notes. The two researchers independently carried out an assessment of the risk of bias in the included studies based on separate criteria for RCT and non-RCT studies (Higgins et al., 2011; Sterne et al., 2016). Treatment effects were calculated, and suitable data was pooled to perform meta-analysis. A table summarising the findings was created to report the main comparisons. The quality of the produced body of evidence was assessed with five GRADE considerations (GRADEpro, 2015). (Original publications IV and V.)
5 RESULTS

5.1 CHARACTERISTICS OF UNEMPLOYED PARTICIPANTS

The characteristics of the unemployed participants included in sub-study I and III are presented in this section. The participants’ mean age was 43.3 years, with half (50%) of them under 45 years old. Less than a half of the participants (43%) were women and over a half (55%) were married or cohabiting. One fourth (25%) had young children living in their household. On average, they had completed 13.3 years of education, and over a half of the participants (52%) had a high level of education (≥ 13 years). The mean duration of unemployment was 16.3 months, and in more than half the cases (62%), the unemployment was short-term (duration of unemployment ≤ 12 months). Most participants (76%) were living in an urban area.

The majority of the participants (89%) had been wage and salary earners in their most recent job. Around one third (35%) had experienced low physical strain and one fourth (25%) low mental strain. Over a half (59%) had been satisfied with their most recent job. Around a half of the participants perceived their health as good and most of them (80%) had good mental health. Over a half of the participants (63%) had a good quality of life. Most of them perceived their work ability as good (62%), while work ability concerning physical demands of work was good among 63% and work ability concerning mental demands of work among 69% of the participants. The mean WAS score was 7.4.

Most participants (60%) had normal body weight and their mean BMI was 24.9. Three quarters of the participants (75%) were not daily smokers and of those who smoked daily had been smoking for nine years on average. The mean AUDIT-C score was 4.4 and a third of the participants (32%) were low risk users. A quarter (25%) consumed vegetables 6–7 days per week. About a half (45%) had taken part in health promotion groups. A third of the participants engaged in regular high-intensity exercise (36%) and a third (30%) spent a maximum of two hours of their leisure time sitting during each day.

5.2 INDIVIDUAL, SOCIAL AND WORK-RELATED FACTORS (SUB-STUDY I)

Sociodemographic, work-related, and wellbeing factors

In a multivariate logistic regression analysis, when all the variables were entered as part of the same step, good work ability was significantly associated with the following factors: having children under 18 years living in the household, short-term unemployment, low or moderate physical strain in the most recent work, moderate mental strain at work, job satisfaction, good self-rated health, and good quality of life. Good health was the most significant factor (OR 10.53, 95% CI 5.90–18.80). The variance of good work ability was explained with these factors by 56%. Table 5 shows
all the regression estimates for bivariate and multivariate analyses. The results are reported in detail in original publication I.

Table 5. Factors associated with the good work ability of unemployed people bivariate and multivariate odds ratios (OR) and confidence intervals (CI).

<table>
<thead>
<tr>
<th>Factor (reference category)</th>
<th>Bivariate</th>
<th></th>
<th>Multivariate</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>OR 95% CI</td>
<td>OR 95% CI</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Age &lt; 45 (≥ 45)</td>
<td>1.81</td>
<td>1.47–2.21</td>
<td>1.34</td>
<td>0.75–2.40</td>
</tr>
<tr>
<td>Woman (man)</td>
<td>1.12</td>
<td>0.92–1.36</td>
<td>0.98</td>
<td>0.59–1.63</td>
</tr>
<tr>
<td>Married or cohabiting (not married)</td>
<td>1.59</td>
<td>1.30–1.95</td>
<td>0.86</td>
<td>0.48–1.55</td>
</tr>
<tr>
<td>Children under 18, yes (no)</td>
<td>1.39</td>
<td>1.09–1.76</td>
<td>2.74</td>
<td>1.34–5.61</td>
</tr>
<tr>
<td>Education ≥ 13 years (&lt; 13)</td>
<td>2.12</td>
<td>1.73–2.60</td>
<td>1.44</td>
<td>0.81–2.55</td>
</tr>
<tr>
<td>Unemployment duration ≤ 12 months (&gt; 12)</td>
<td>2.68</td>
<td>2.08–3.47</td>
<td>2.00</td>
<td>1.17–3.40</td>
</tr>
<tr>
<td>Wage and salary earner (not)</td>
<td>1.27</td>
<td>0.91–1.77</td>
<td>1.84</td>
<td>0.61–5.61</td>
</tr>
<tr>
<td>Physical strain, moderate (high)</td>
<td>1.80</td>
<td>1.39–2.34</td>
<td>2.36</td>
<td>1.14–4.90</td>
</tr>
<tr>
<td>Physical strain, low (high)</td>
<td>2.58</td>
<td>2.03–3.28</td>
<td>1.96</td>
<td>1.00–3.81</td>
</tr>
<tr>
<td>Mental strain, moderate (high)</td>
<td>1.45</td>
<td>1.15–1.84</td>
<td>2.03</td>
<td>1.06–3.89</td>
</tr>
<tr>
<td>Mental strain, low (high)</td>
<td>1.64</td>
<td>1.26–2.14</td>
<td>1.15</td>
<td>0.56–2.37</td>
</tr>
<tr>
<td>Job satisfaction, satisfied (not)</td>
<td>2.41</td>
<td>1.96–2.96</td>
<td>1.96</td>
<td>1.08–3.54</td>
</tr>
<tr>
<td>Self-rated health, good (not good)</td>
<td>12.09</td>
<td>9.57–15.29</td>
<td>10.53</td>
<td>5.90–18.80</td>
</tr>
<tr>
<td>Mental health, good (not good)</td>
<td>3.28</td>
<td>2.54–4.24</td>
<td>1.59</td>
<td>0.72–3.53</td>
</tr>
<tr>
<td>Quality of life, good (not good)</td>
<td>13.11</td>
<td>9.50–18.08</td>
<td>2.97</td>
<td>1.46–6.04</td>
</tr>
</tbody>
</table>

OR bolded when significant, p<0.05
Health behaviours
The work ability was significantly better among younger, married or cohabiting, those with high education, and short-term unemployed persons compared to older, not married or cohabiting, those with low education, and long-term unemployed persons (Figure 3). In addition, some differences in health behaviours were found between groups. The participants without underaged children in their household had a lower BMI compared to those with young children. Participants with young children were more likely to consume alcohol moderately compared to those with no children in their household. Moreover, more men consumed alcohol moderately than women. Younger people had taken part in health promotion groups more often than older respondents. And finally, participants with young children spent less leisure time sitting compared to those without young children.

Figure 3. Statistically significant differences in work ability by age, marital status, education, and unemployment duration.

None of the health behaviours had a significant association with work ability in a bivariate regression analysis. No associations were also found in the multivariate analysis when all health behaviours were entered into the model. Only after adjusting for sociodemographic factors, high-intensity physical activity became significantly associated with work ability. This model explained 12% of the variance of work ability. (Table 6.) Original publication II reports the results in detail.
Table 6. Odds ratios (OR) and 95% confidence intervals for associations of health behaviours and good work ability.

<table>
<thead>
<tr>
<th>Health behaviours (reference category)</th>
<th>OR^a</th>
<th>95% CI</th>
</tr>
</thead>
<tbody>
<tr>
<td>BMI, normal &lt; 25 (overweight &gt; 25)</td>
<td>0.97</td>
<td>0.67–1.41</td>
</tr>
<tr>
<td>Daily smoking, no (yes)</td>
<td>0.90</td>
<td>0.58–1.38</td>
</tr>
<tr>
<td>Alcohol consumption, no or moderate use (risk level use)</td>
<td>1.13</td>
<td>0.71–1.79</td>
</tr>
<tr>
<td>Vegetable consumption, 6-7 days a week (≤ 5 days a week)</td>
<td>0.90</td>
<td>0.58–1.42</td>
</tr>
<tr>
<td>Health promotion groups, participated (did not participate)</td>
<td>0.86</td>
<td>0.59–1.25</td>
</tr>
<tr>
<td>Physical exercise, high-intensity physical activity (low)</td>
<td>1.60*</td>
<td>1.06–2.43</td>
</tr>
<tr>
<td>Leisure time sitting, 0-2 h/day (≥ 3 h/day)</td>
<td>1.01</td>
<td>0.67–1.52</td>
</tr>
</tbody>
</table>

^a Adjusted for all other health behaviours and sociodemographic factors (gender, age, marital status, minors (under-18s), education, living environment, and duration of unemployment).

*p significant at the <0.05 level.

5.3 HEALTH, WORK ABILITY AND EMPLOYMENT (SUB-STUDY II)

Study sample of sub-study II (n = 12,729) included 11,262 full-time employed and 1,467 unemployed or laid-off persons (original publication III). The groups differed significantly in all study variables. The employed respondents were younger, more often women, and more often married or cohabiting than the unemployed ones. The unemployed persons had a lower level of work ability. They also had poorer health, perceived less meaning, had weaker social networks, and were less physically active. The mean duration of unemployment was 15.5 months. All the study and control variables correlated significantly.

The proposed model (hypotheses 1–2) did not have an acceptable model fit, with NFI = .966, CFI = .966 and RMSEA = .112. The modification indices suggested additional paths: direct positive associations of meaningfulness, social networks, and physical activity with employment. Furthermore, the direct path from health to employment was not significant and was therefore removed. Independent variables (meaningfulness, social networks, and physical activity) were also allowed to correlate. These modifications led to an improvement in the model fit: $\chi^2 [1] = 14.39$, $p = .000$, NFI = .999, CFI = .999, RMSEA = .032 (95% CI .067–.076).
Table 7. Direct, indirect, and total standardized regression weights, all significant at the level \( p \leq .001 \).

<table>
<thead>
<tr>
<th></th>
<th>Direct effect</th>
<th>Indirect effect</th>
<th>Total effect</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Standardised regression weights</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Health ( \rightarrow ) work ability</td>
<td>.51</td>
<td></td>
<td>.51</td>
</tr>
<tr>
<td>Health ( \rightarrow ) employment</td>
<td>ns.</td>
<td>.07</td>
<td>.07</td>
</tr>
<tr>
<td>Work ability ( \rightarrow ) employment</td>
<td>.14</td>
<td></td>
<td>.14</td>
</tr>
<tr>
<td>Meaningfulness ( \rightarrow ) health</td>
<td>.24</td>
<td></td>
<td>.24</td>
</tr>
<tr>
<td>Meaningfulness ( \rightarrow ) work ability</td>
<td>.19</td>
<td>.12</td>
<td>.31</td>
</tr>
<tr>
<td>Meaningfulness ( \rightarrow ) employment</td>
<td>.06</td>
<td>.04</td>
<td>.10</td>
</tr>
<tr>
<td>Social networks ( \rightarrow ) health</td>
<td>.08</td>
<td></td>
<td>.09</td>
</tr>
<tr>
<td>Social networks ( \rightarrow ) work ability</td>
<td>.08</td>
<td>.04</td>
<td>.12</td>
</tr>
<tr>
<td>Social networks ( \rightarrow ) employment</td>
<td>.05</td>
<td>.02</td>
<td>.07</td>
</tr>
<tr>
<td>Physical activity ( \rightarrow ) health</td>
<td>.29</td>
<td></td>
<td>.29</td>
</tr>
<tr>
<td>Physical activity ( \rightarrow ) work ability</td>
<td>.06</td>
<td>.15</td>
<td>.21</td>
</tr>
<tr>
<td>Physical activity ( \rightarrow ) employment</td>
<td>.16</td>
<td>.03</td>
<td>.19</td>
</tr>
<tr>
<td><strong>Correlations</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Meaningfulness – social networks</td>
<td>.40</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Meaningfulness – physical activity</td>
<td>.22</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Social networks – physical activity</td>
<td>.17</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Hypothesis 1a was only partially supported by the correlations, since health had no direct significant association with employment. Hypothesis 1b and all the Hypotheses 2 were supported. The final model explained 43% of work ability, 20%
of health, and 9% of employment variances. Table 7 shows direct, indirect, and total standardized regression weights. (Original publication III.)

5.4 RESOURCE MODEL OF WORK ABILITY (SUB-STUDY III)

The correlations between all the model variables were significant apart from the correlations between age and job satisfaction, age and meaningfulness, education and meaningfulness, education and quality of life, unemployment length and physical activity, and job satisfaction and physical activity. The correlations were strong between meaningfulness and the quality of life ($r = .59$), health and work ability ($r = .63$), health and the quality of life ($r = .59$), working until retirement age and work ability ($r = .60$), and work ability and the quality of life ($r = .53$). Following decided fit indices, model fit was good for the proposed variables and their causal relations (Figure 4): $\chi^2(11) = 1.418$, $p = .156$, NFI = .997, TLI = .994, CFI = .999, RMSEA = .015 (95% CI .000 – .031). Higher age associated positively with the duration of unemployment, job satisfaction, meaningfulness, and the quality of life, and in turn, negatively with the received social support, physical activity, health, and work ability. Higher education associated positively with social support, physical activity, health, belief that one can work until retirement age, and work ability. By contrast, higher education associated negatively with job satisfaction and the quality of life. A longer duration of unemployment associated negatively with social support, job satisfaction, meaningfulness, health, belief in working until retirement age, and work ability. Perceived social support associated positively with physical activity, job satisfaction, belief in working until retirement age, and quality of life.

A high level of physical activity associated positively with people’s sense of meaningfulness, health, and a belief in working until retirement age. High job satisfaction with previous job associated positively with meaningfulness, health, belief in working until retirement, work ability, and the quality of life. Perceiving life as meaningful associated positively with health, belief in working until retirement, work ability, and the quality of life. Good self-perceived health associated positively with a belief in working until retirement age, work ability, and the quality of life. A strong belief in working until retirement age associated positively with work ability. And finally, good work ability associated positively with the quality of life. A strongest standardized regression weight ($\beta = .40$) in the model was the association of health with work ability. The model explained 6% of the variance in the length of unemployment, 6% of the variance in social support, 3% of the variance in physical activity, 2% in job satisfaction, 10% in meaningfulness, 23% in health, 29% in the belief in working until retirement age, 55% in work ability, and 57% in the variance of the quality of life. Figure 4 shows paths presented as standardized regression weights, all significant at the level $p < .001$. 

50
5.5 HEALTH INTERVENTIONS FOR UNEMPLOYED PEOPLE (SUB-STUDY IV)

A total of 5,112 references were found through a comprehensive literature search. After removing duplicates, 3,541 references were screened for eligibility, and of them, 3,475 were excluded. Additional references were searched using the reference
lists of included studies and the retrieved systematic reviews (Audhoe et al., 2010; Koopman et al., 2017; Liu et al., 2014; Mawn et al., 2017; Moore et al., 2017; Suijkerbuijk et al., 2017; van Rijn et al., 2016), and six additional references were reviewed. After a full-text review of 66 studies, 53 were excluded due to a lack of intervention or re-employment outcomes, or due to the wrong participant group. Based on contacts with the corresponding authors, the data of one study could be included, while the data of 2 trials were not available. A total of 18 included papers reported the outcomes of 13 studies.

The studies included 6,251 participants and they had all been conducted in high-income countries: The United States (n = 4), the Netherlands (n = 2), Australia (n = 2), Israel (n = 1), Finland (n = 2), Germany (n = 1), and Spain (n = 1). In five studies participants were short-term unemployed, three studies included long-term unemployed participants, and participants with any duration of unemployment were included in five trials. The selected studies were all RCTs and used several methods in interventions. The risk of bias in the included studies was assessed with seven risk of bias items. A summary of these items showed that the highest risk of bias was concerned with blinding and selective reporting, and the lowest risk of bias was concerned with the randomization process. (Original publication V.)

The included studies were all multicomponent and could be classified as group training and support interventions (Brenninkmeijer et al., 2012; Caplan et al., 1989; Creed et al., 1999; Eden et al., 1993; Hodzic et al., 2015; Proudfoot et al., 1997; Schuring et al., 2009; Vinokur et al., 1995; Vuori et al., 2002), individual emotion training interventions (Spera et al., 1994; Joseph & Greenberg, 2001), and individual health support interventions (Herbig et al., 2012; Romppainen et al., 2014). Health-improving components in the included studies aimed at enhancing mental, social, and physical health by strengthening participants’ self-esteem and self-efficacy, increasing constructive thoughts and optimism, providing coping skills (with setbacks and barriers, emotion regulation, health-related problems, negative consequences of unemployment), and enhancing social support.

The results showed a moderate quality of evidence of the fact that group training and support interventions, compared to practice as usual, increased re-employment in a long-term follow-up (RR = 1.11, 95% CI 1.02–1.20, n = 3541). Individual emotion training interventions, compared to no intervention (RR 2.51, 95% CI 1.19–5.30, n = 41), and to placebo intervention (RR 1.80, 95% CI 1.04–3.12, n = 52), showed effects of increased rates of re-employment; however, the quality of evidence in this area was very low. The results showed no difference of the effects of individual health support interventions compared to care as usual (RR 1.31, 95% CI 0.55–3.12, n = 393) with low quality evidence. The analyses showed no health effects in any category. The results are presented in detail in original publication V.
5.6 SUMMARY OF THE RESULTS

The results showed that unemployed persons had lower work ability compared to their employed counterparts. Good work ability was associated with having young children living in the household, short-term unemployment, low or moderate physical strain in the most recent job, moderate mental strain in the most recent job, job satisfaction, good self-rated health, a good quality of life, and high-intensity physical activity. Moreover, unemployed persons had poorer health, they less often perceived life as meaningful, were less satisfied with their social networks, and engaged in high-intensity exercise less frequently than the employed respondents. When examining the association of health and work ability with employment status, it was found that work ability mediated the effect of health on employment status. Health had an important association with work ability and, furthermore, good work ability was the strongest predictor of having a job. The resource model of work ability showed that work ability was part of the person’s overall wellbeing and quality of life with many individual, social, and work-related factors influencing these. Finally, the systematic review and meta-analysis showed that the re-employment of unemployed persons could be improved by health interventions that were based on group training and support methods. Meta-analyses showed that the included interventions had produced no effects on health. Figure 5 summarizes the results of the sub-studies. Continuous line describes the directions of associations on the results and dashed line means that no association was found.
Figure 5. Summary of the results.

Quality of life (sub-study III)

Health (sub-study II) influenced by:
- Meaningfulness
- Social networks
- Physical activity

Good work ability (sub-study I-III) associated with:
- Younger age
- High level of education
- Short-term unemployment
- Having young children in the household
- Good self-rated health
- Good quality of life
- Low or moderate physical job strain
- Moderate mental job strain
- High job satisfaction
- Belief in working until retirement age
- High perceived meaningfulness
- Good social networks
- High-intensity physical activity

Employment (sub-study II, IV)

Health interventions (sub-study IV)
Group training and support interventions have potential to increase re-employment. Interventions had no effects on health, and work ability was not addressed in included interventions.
6 DISCUSSION

6.1 DISCUSSION OF THE STUDY RESULTS

6.1.1 Overview of the main results

This study explored the factors associated with the work ability of unemployed persons, examined the interrelations of work ability, health, and employment status, and assessed the effectiveness of health interventions in improving re-employment among unemployed people. The study found protective factors that may promote good work ability and thus provide a strong resource pool for coping with the harmful effects of unemployment. This study produces new knowledge of work ability during unemployment and contributes to the wider discussion on causal relations between health, work ability and unemployment.

The main results show that among the many factors involved, good health was the most important resource in the perceptions of good work ability. Furthermore, while good work ability strongly predicted employment status, contrary to the expectations and earlier evidence, health was not directly associated with employment status. In the study population, the effect of health on employment was mediated by work ability. This study shows that, for unemployed persons, good work ability is a part of overall wellbeing and quality of life. However, aspects of the person’s earlier job are still present. Findings reveal that the concept of work ability covers the past of an unemployed person and also extends to his or her future. The results also show moderate quality evidence suggesting that health-improving interventions based on group training and support succeeded in promoting people’s employment status. However, they did not show difference in the effects on health outcomes compared to control groups, and no interventions focused on promoting the work ability unemployed people were found.

6.1.2 Promoting factors of work ability in unemployed persons

Factors associated with good work ability were evaluated in two sub-studies with original publications and a resource model created for this summary. However, each of these used different approaches. The first sub-study explored the associations of sociodemographic, work-related, and wellbeing factors, and health behaviours with the good ability of unemployed persons using logistic regressions. The second sub-study used a sample including unemployed and employed people to indicate direct and undirect effects of four factors, health, meaningfulness, and social networks, and physical activity, on work ability in a structural equation model. A resource model was used to explore the complex net of relations between the factors in the unemployed population in a path analysis. This study assumed that the work ability of unemployed people would follow the conceptual model of work ability of Lederer.
et al. (2014), and the protective factors associated with the work ability of unemployed people are discussed through this adapted model (Figure 6). The work ability factors of unemployed people were divided into three categories named individual, environmental, and societal levels. It is notable that the same factor could be placed in more than one level, because the factors may have different relevance for an individual or society. Figure 6 aims to confirm the model, which was created based on work ability research conducted among employed, among unemployed people. The factors that this study did not address were left unchanged. The new factors this study found are presented in bold and those found by earlier research conducted among unemployed people are in italic.
Figure 6. Factors of the work ability of unemployed persons divided into individual, environmental, and societal levels, modified from Lederer et al. (2014).
The factors of work ability at the individual level

The individual level included personal attributes and conditions, and this study data was best addressed to identify these factors. The factors included health status, the quality of life, motivational aspects such as belief in working until retirement age and meaningfulness, demographics such as age and unemployment duration, education, having young children living in the household, reflecting the person’s perceived social role as a parent, and physical activity. Of these factors, only health (Kerätär & Karjalainen, 2010; Szlachta et al., 2012), age (Szlachta et al., 2012), education (Hult et al., 2017; Pensola et al., 2008) and duration of unemployment (Hult et al., 2017; Laiho et al., 2010; Lappalainen et al., 2017; Pensola et al., 2008; Szlachta et al., 2012) had been identified as factors related to the work ability of unemployed people in previous studies.

The role of the quality of life was further studied with a more comprehensive resource model and, as assumed, work ability turned out to be one of the factors predicting the quality of life, and this association with work ability was strong. An alarming proportion, 40%, of the unemployed participants experienced a poor quality of life. This result may show the presence of a loss cycle (Hobfoll, 1989; Vanhercke et al., 2015), wherein a job loss possibly induces a lack of resources important for the quality of life: self-esteem, satisfaction with leisure time, social relations, and the possibility to participate in decision-making (Worach-Kardas & Kostrzewski, 2014). However, re-employment improves the person’s quality of life, and this is gets even better when the employment continues (Carlier et al., 2013).

Meaningfulness was closely related to the quality of life but also to work ability (Hult et al., 2017). Perceiving life as meaningful is a central element in the salutogenic approach (Antonovsky, 1988), and according to results, it has an important impact on a person’s health and employment status. Meaningfulness is part of the sense of coherence that has been found to be lower among unemployed people compared to those in employment. In unemployed population, low SOC has been found to be associated with impaired work ability and distress (Feldt et al., 2005; Vastamäki et al., 2014). Meaningfulness involves a strong motivational standpoint, and thus helps an unemployed person to commit to active job seeking. Moreover, it contributes to healthy lifestyles, as it has been found to serve as a mediator between a person’s self-esteem, self-efficacy, and health behaviours (Wiesmann & Hannich, 2011).

In the results, health and job satisfaction were the most important predictors of the person’s belief that he or she could continue working until the official retirement age. Along with meaningfulness, the belief in working until retirement age represented the motivational dimension of work ability of the unemployed people included in this study. This finding is important from the viewpoint of the need to prolong the careers of ageing workers. It has been argued that motivation is the most prominent aspect in wellbeing at work (Salmela-Aro & Nurmi, 2004). However, conflicting evidence was found, indicating no relationship between work motivation and wellbeing at work, in this case in the context of burnout and engagement (Lopes & Chambel, 2016.) In their model of work participation, Feißel et al. (2018) emphasise
the central role of work ability, which affects work motivation on one side and health on the other, in participating in work in older age. In this study, the factor of a person’s belief in working until retirement age influenced work ability, and not vice versa, but as the participants were unemployed, the question is highly hypothetical and even unrealistic, as the respondents lacked the experience of possible work-related stress due to their current unemployment (Feißel et al., 2018). It is therefore suggested that, also for unemployed persons, (work) motivation may act as a resource for coping better with stress (Antonovsky, 1988).

It was found that short-term unemployment was associated with good work ability, and this finding was confirmed by earlier evidence (Hult et al., 2017). Long-term unemployment as a risk factor for decreased work ability was also confirmed (Laiho et al., 2010; Lappalainen et al., 2017; Pensola et al., 2008; Szlachta et al., 2012), and even though the protective and risk factors are not always the same (Lindberg et al., 2006), this is likely to be the case with this particular factor. Long-term unemployment is a substantial risk, in addition to health and work ability outcomes, for marginalization, social exclusion, and poverty (López del Amo González et al., 2018; Worach-Kardas & Kostrzewski, 2014).

The cross-sectional design of the first sub-study was only focused on showing associations, and this finding indicates that a selection effect occurred, i.e. poor work ability causes prolonged duration of unemployment. This has also been shown by Nørup (2019), who argues that while labour market exclusion does not in itself lead to unrealized social citizenship, chronic illness does have this effect; unemployment only mediates the effect of illness on social marginalization. Previous studies confirm the high prevalence of diagnosed and non-diagnosed illnesses and disability among the long-term unemployed population (Kerätär & Karjalainen, 2010; Szlachta et al., 2012; Worach-Kardas & Kostrzewski, 2014), and many of them also struggle to find employment due to problems other than those related to health.

Interestingly, education did not have an association with work ability in the regression analysis, but the resource model showed a direct effect of education on work ability, and on all the other factors except for meaningfulness and the duration of unemployment. A low level of education has been found to be a risk for decreased work ability among unemployed people (Pensola et al., 2008). Furthermore, in a resource model, education had the strongest association with a belief that a person could continue working until the official retirement age. This may show that unemployed participants with a high level of education perceived their health as good enough (Putrik et al., 2018), but were also motivated in their earlier working careers. Job satisfaction had an association with working until retirement age as well but, by contrast (Ilies et al., 2018), education was negatively related to job satisfaction. Another finding contradictory to earlier evidence (Szlachta et al., 2012) was that age was not associated with work ability in the regression analysis; however, in resource model, higher age predicted lower work ability and longer unemployment duration. In these study results, in line with earlier studies, higher age predicted better job satisfaction, higher level of meaningfulness and a better quality of life (Clause-
Verdreaux et al., 2019; Dobrow Riza et al., 2018; Ilies et al., 2018; Morgan & Robinson, 2013).

Only a third of the participants in this study engaged in regular high-intensity physical activity and no significant differences were found between sociodemographic groups. When the physical activity of unemployed people was compared to that of the employed, it was found that those who were unemployed engaged in less physical activity than the employed people. This study showed the importance of regular activity to retaining one’s work ability during unemployment and it was the only health behaviour that had an association with work ability. No earlier studies addressing work ability and the physical activity of unemployed persons were found. However, evidence shown in the context of employed people confirms the impact of physical activity on work ability (Calatayud et al., 2015; Nawrocka et al., 2018; Nevanperä et al., 2016; Päivärinne et al., 2019). Resource model showed that the effect of physical activity was mediated by health, and no direct effect was found.

*The factors of work ability at the environmental level*

Environmental level consisted of four dimensions that influence the work ability of unemployed persons: work, healthcare, insurance, and community. In connection with the dimension of work in the work ability model (Figure 6), the unemployed respondents of the ATH study were asked to consider their most recent jobs when answering questions about work. Physical strain and mental strain in the most recent job, job satisfaction, and a belief in working until retirement age were associated with work ability. These were all new associations found by this study, and they show that work-related aspects are still important even when a person has lost his or her job.

Job satisfaction reflects both individual and organisational aspects and working conditions. It has been argued that job satisfaction could be a personal character. Therefore, when assessing job satisfaction in the context of unemployment, it the factor can reflect the person’s overall, steady satisfaction in life. (Dormann & Zapf, 2001.) A dated study by Wanberg (1999) repealed an earlier assumption that high job satisfaction would lead to more negative attitudes towards unemployment. Instead, the study (Wanberg, 1999) also confirmed associations between job satisfaction, and mental health and life satisfaction in unemployed persons. Interestingly, Gowan (2012) found that the psychosocial elements of employability, personal adaptability and career identity that motivate future career decisions (Fugate et al., 2004) predicted job satisfaction and psychological wellbeing among persons who had lost their jobs and were later re-employed. Reciprocity between job satisfaction and wellbeing has also been proven by Satuf et al. (2018), who found an association between job satisfaction and health, subjective wellbeing, happiness, and self-esteem. Thus, it can be suggested, that job satisfaction assessed during unemployment does not necessarily reflect the people’s most previous job, but rather their personal psychological characteristics.
The dimension of healthcare included individuals' health status, which was measured with self-rated health (SRH). This study showed that, among the unemployed population, health predicted work ability. The healthcare sector is at the forefront of work ability assessment and promotion among unemployed persons. However, there is strong evidence indicating that unemployed people receive fewer health care services than those at work and that the population group has unmet needs (Herbig et al., 2013; Kerätär & Karjalainen, 2010; Lappalainen et al., 2018; Madureira-Lima et al., 2018; Åhs et al., 2012). The insurance dimension in the model of the work ability of unemployed people is closely related to health, since the insurance sector is responsible for rehabilitation alongside with the health care sector. It is also connected to the person's financial situation. Unemployment insurance payments are collected from all the employees and employers in Finland, but only those unemployed who are members of unemployment funds are entitled to receive earnings-related allowances. This allowance, however, is dependent on the duration of unemployment. Thus, prolonged unemployment leads to a reduction in unemployment benefits causing financial strain that, in turn, is related to the impaired work ability among the unemployed population (Pensola et al., 2008).

The dimension of community is the most important environmental aspect when conceptualizing the work ability of unemployed persons. It includes family members, relatives, and friends, and in this study, was related to the following factors: social networks, social support, and having young children in the household, and the dimension also contributed to the person's quality of life. These factors may replace the latent factors of work (Jahoda, 1981) by creating feelings of belonging, emotional, practical, and financial support, and time structure (Huffman et al., 2015). Social support can be considered one of the basic resources that helps unemployed persons to cope with the stress of unemployment (Antonovsky, 1988; Hobfoll, 1989). In this study, social support and social networks were most strongly related to meaningfulness, and it was assumed that meaningfulness mediated the effect of social support on the person's health as well as his or her work ability. Health has been found to be strongly associated with social support in the working-aged population (Häusler et al., 2018), and also among unemployed people, a high level of social support predicts lower psychological stress and better mental health compared to low support (Milner et al., 2016; Tuncay & Yildirim, 2015). Perceived social support and satisfaction with relationships are very likely to indicate the presence of a strong social network that may be valuable in job-seeking (Wanberg, 2012). As community-level factors have not been previously studied in relation to the work ability of unemployed people, this is all new knowledge.

**The factors of work ability at the societal level**
While the data of the present study did not as such cover societal level factors, such as policies, legal issues or macroinfrastructures, these nonetheless have considerable consequences on unemployed persons' work ability. This study showed that the duration of unemployment and belief in working until retirement age are connected
to labour market dynamics. In addition to personal factors, the duration of unemployment depends on the overall unemployment rate and economic trends. In times of economic recovery, unemployed persons have a more positive perception of their work ability if there are a lot of vacancies. On the other hand, the duration of unemployment may increase in the case of job mismatch, when there are no suitable jobs within a reasonable distance from the job seeker, or his or her education and experience do not meet the requirements of vacant positions (Pehkonen et al., 2018). The ageing of the population and the following working age shift require workers to be able to maintain good work ability longer in order to work until the official retirement age. In his study, health and job satisfaction were most likely to predict the belief that the person could work until retirement age, which, in turn, strongly predicted work ability. This finding is partly contradictory with the large body of evidence indicating that health impairments and low work ability lead to early retirement (e.g. Boissonneault & de Beer, 2018). Among unemployed respondents, however, the belief in working until retirement age is hypothetical and is a motivational aspect of work ability.

6.1.3 Work ability mediates the effect of health on employment

Sub-study II examined relationships between health, work ability and employment status, and analysed the associations of meaningfulness, social networks, and physical activity with health and work ability among employed and unemployed people. The main finding of the study was that people with good health were also more likely to have good work ability. Furthermore, the people with good work ability were more often employed than unemployed. In a model created in the sub-study, health had no significant direct effect on employment status contrary to expectations. This means that the effect on health of employment was mediated by work ability. This could be considered a remarkable finding, because no studies were found that address mediational relations between these factors. The findings of this study suggest, in line with the selection hypothesis (Virtanen et al., 2013; Wagenaar et al., 2012), that poor health and decreased work ability are reasons for becoming unemployed, and not vice versa. Notable is, that the effects of employment status on work ability and health were also tested, but these effects were not statistically significant.

Meaningfulness, social networks, and physical activity were positively related to both health and work ability. They can thus act as protective factors promoting good health and work ability and, furthermore, contribute to the person’s employment status. In addition, all of them were directly related to employment status, and therefore, can be considered important resources. Meaningfulness plays a role in healthy lifestyles, because through it, self-esteem and self-efficacy help maintaining behaviours that are beneficial to health (Wiesmann & Hanning, 2011). Meaningfulness also helps an unemployed person to be committed to active job seeking because of its motivational nature. Moreover, earlier research supports the
finding that social support and satisfaction with relationships are positively related to health (Häusler et al., 2018).

The results of this sub-study show that it is important to prevent poor health and work ability among employed people (Boissonneaut & De Beer, 2018). Preventive measures in workplaces may prevent those at risk from becoming unemployed. It is also necessary to promote good health and work ability among unemployed people so that they have better prospects for employment. Of course, not all unemployed people have health barriers for re-employment. However, this issue is urgent, as those who are unemployed lack possibilities, particularly those concerning work ability promotion (van Egmond et al., 2015). At the period of data collection, in 2014–2015 (Appendix 1), the unemployment rate was higher than in 2019. It is found that in times of high unemployment, the wellbeing loss among unemployed people is smaller than in times of lower unemployment rate (Böckerman & Ilmakunnas, 2009). On this basis, the wellbeing gap between the employed and the unemployed may be even higher in 2019.

6.1.4 Interventions improving re-employment among job seekers

The aim of the sub-study IV, the systematic review and meta-analysis, was to assess the effectiveness of health-improving interventions for obtaining employment in unemployed job seekers. The results showed that group interventions, including various measures, such as cognitive and behavioural training, group discussions, group activities, and social support by peers and trainers, have potential for increasing re-employment. Most of the earlier reviews assessing the effectiveness of interventions with health-improving aims and components have only reported health outcomes, without including information about re-employment outcomes (e.g. Gabrys et al., 2013). The results of this study may be supported by a review that assessed vocational interventions, finding weak evidence of improved re-employment and mental health (Audhoe et al., 2010), and a meta-analytic review that showed the positive effect of job search interventions on re-employment (Liu et al., 2014).

The health-improving components of the included interventions targeted mainly the participants’ mental health: self-esteem, self-efficacy, and coping with the negative consequences of unemployment. Unfortunately, this study could not use the results of all included studies concerning health outcomes because of insufficient reporting, and therefore, cannot supply comprehensive evidence on health effects. Some results were available, and the evidence showed no health effects of included interventions. However, the available evidence shows that interventions combining occupational skills and resilience training related to mental health may improve people’s mental health (Koopman et al., 2017).

In principle, the included studies were conducted in the 1990s (Vuori et al., 2002, data collection in 90s). There was no clear change in the contents of interventions, even though the included studies covered over than 25 years. While the most recent study (Hodzic et al., 2015) was an emotional competence intervention study, so was
also one of the oldest studies (Spera et al., 1994). The JOBS preventive job search training protocol was developed in 1980s, and four studies were based on this protocol (Brenninkmeijer et al., 2012; Caplan et al., 1989; Vinokur et al., 1995; Vuori et al., 2002). It has been found effective in earlier reviews (Audhoe et al., 2010; Liu et al., 2014) and also contributed strongly to the effects of group training and support interventions compared to usual practices in this study. More precisely, the protocol increased re-employment among short-term unemployed people. Liu et al. (2014) have also found that job search interventions had the strongest effect on this group of unemployed people.

The duration of unemployment is a key factor when designing, implementing, and assessing the effectiveness of interventions. Given that prolonged unemployment weakens mental health and decreases self-esteem (McKee-Ryan et al., 2005), those with short-term unemployment may be expected to find jobs more easily. In only one of the studies included in the present research, interventions that also included people with long-term unemployment promoted re-employment compared to a control group (Proudfoot et al., 1997); however, due to the low quality of evidence, the results should be treated with caution. This group training and support intervention was based on cognitive-behavioural approach. Innovative interventions should be developed and offered to people with long-term unemployment, and the interventions should be assessed with rigorous methods. Two of the interventions included in this study applied innovative methods, writing and self-generated imagery; however, these studies included people with short-term unemployment. While the results of these interventions showed major positive effects, the quality of the evidence was very poor, making the results uncertain. The low quality was caused by small sample sizes and major impacts in both studies. This may due to publication bias, which means that small studies with negative effects are more likely to remain unpublished than their opposites. Overall, high risk of bias that decreased the quality of evidence in included studies was due to inadequate randomization, lack of blinding, and inappropriate outcome reporting.

Another critical issue of intervention evaluation is the cultural and societal context where the intervention has been conducted. All the interventions included by this study had been implemented in rich countries, as a result of which their results cannot be generalized as such. The effects of interventions may also vary between rich countries, for instance, depending on the unemployment benefits and the coverage of social security in each particular country. In countries with low unemployment security, re-employment is expected to occur faster than in countries with better unemployment benefits. The duration of unemployment benefits may also be a relevant factor to the re-employment rate. In this study, interventions conducted in the US were more effective than interventions conducted in Europe. On the other hand, Vuori et al. (2002) found that an intervention developed in the US (JOBS) had also been effective in Finland. This shows that the contents of an intervention, strengthening problem-solving and decision-making processes, increasing resistance to disappointments or, as the authors call this, inoculation
against setbacks, and receiving social support, had been designed well to meet the needs of unemployed job seekers (Caplan et al., 1989; Vinokur et al., 1995).

It is also interesting that so-called health promotion interventions (Herbig et al., 2012; Romppainen et al., 2014; Schuring et al., 2009) did not show positive results, even though the studies by Herbig et al. (2012) and Schuring et al. (2009) included participants with some health problems. Two of the studies included providing participants with contact to health care professionals (Herbig et al., 2012; Romppainen et al., 2014) and one was based on a group-level pain management approach with physical exercises (Schuring et al., 2009). Moreover, these interventions also failed to show mental and general health effects. It may be concluded, albeit with caution (only three studies), that prevocational health support does not improve employment prospects. By contrast, there is evidence of effective reversed methods. Among unemployed people suffering from a severe mental health illness, interventions with health support offered alongside with a competitive employment using the Individual Placement and Support (IPS) approach have been shown to be effective (Suijkerbuijk et al., 2017). However, these interventions are not comparable with the results of this study due to their different target group.

6.2 ETHICAL CONSIDERATIONS

Research ethics
The ethical perspectives of the research process can be divided into three principles, the first being the ethical legitimacy of the research topic (Saaranen-Kauppinen & Puusniekka, 2006). Research conducted among unemployed persons can be justified by its topicality in the context of health promotion. In Finland, inequalities between the population groups are persistent and large in an international comparison, and they have even increased over the last few years. Unemployment, poor health, and poverty are intertwined in a complex phenomenon of disadvantage, which is a risk for social exclusion and marginalization. (THL, 2019a.)

The second principle contributes to the data collection and assessment of how the chosen data collection methods fit into the research questions (Saaranen-Kauppinen & Puusniekka, 2006). Principally, this study used data that were already collected, and this choice was based on ethical consideration. For instance, the National Institute of Health and Welfare produces a significant amount of population-based data that are underutilized in research. For the purposes of the ATH study (which has been continued as the FinSote survey since the autumn of 2017), the study population was randomly retrieved from the national Population Register. A sample population was sent an invitation to take part in the ATH study by filling out self-administered questionnaires returned by mail or online. The study population was given information about the study and gave their informed consent by filling out the survey. For this study, the National Institute of Health and Welfare (THL) granted the authorisation to use their data on the basis of an application based on a research plan. The ATH study was approved by the Ethical Committee of the National
Institute for Health and Welfare, and no separate approval was needed for the purposes of the present study. It is worth noticing that the research question was broadly outlined before beginning the search of suitable data.

The third ethical principle is related to the analysis and reporting of research data (Saaranen-Kauppinen & Puusniekka, 2006). This study was conducted responsibly and following the guidelines of the Finnish Advisory Board on Research Integrity (TENK, 2012). The researcher has the ethical duty to report the research results as honestly and accurately as possible, but at the same time to protect the subjects (Kylmä et al., 2002). In the context of anonymized data, this principle refers to a vulnerable group of people and reporting of results in a respectful manner.

The Cochrane editorial and publishing policy includes ethical considerations (Cochrane, 2019) which were consistent with the guidelines of TENK (2012). The ethical considerations of Cochrane Collaboration focus on the following areas: authorship and contributorship, conflict of interest, libel, plagiarism, and protection of human subjects and animals in research. The review group of this study did not face any ambiguity concerning these issues. However, in Cochrane reviews in general, some similarity between texts is to be expected due to the use of standard templates. The templates have been used for clear presentation of the methods section, for instance. The review included in this study used the template from Cochrane Work Review Group.

Data protection
As the data were assigned to the researcher in November 2015, the EU General Data Protection Regulation (2016/679, GDPR), which entered into force recently, is not taken into account in the context of the obligations of the controller. The data were provided to the purposes of this study in an anonymized form, including no person names, social security numbers, location data, occupations, or email addresses of the participants. This makes it unlikely that a person could be identified by his or her health and wellbeing information, even in the case of highly detailed descriptions containing personal views. THL is the controller of the data and has the right to use the collected personal data for research purposes, for instance, in connections between registers. In light of the GDPR, the data were not completely anonymised, since the THL possesses the code key to access personal data.

6.3 THE RELIABILITY AND VALIDITY OF THE STUDY

Theoretical considerations
The theoretical validity concerning the main concept of this study, work ability, is strong because of the significant amount of research and development on the concept. Nevertheless, the concept is still lacking an unambiguous definition due to its multidisciplinary, complex, and contextual nature. As the subject has been largely studied in the context of the employed population, the research on work ability among unemployed persons is scarce, which makes the suitability of the concept in the context of unemployment still unclear. It seems that, based on earlier research
conducted among unemployed people as well as the results of this study, work ability principally reflects a person's health, and therefore, is suitable for describing the lack of work ability i.e. disability caused by health problems. Furthermore, even though this study showed the role of work-related factors in the work ability of unemployed people, the reliability is not necessarily strong. A long time may have passed since the unemployed person was previously employed and, therefore, the person may make incorrect assumptions of present working conditions. These considerations raise the question of the relevance of using the concept of work ability in unemployment studies.

One possibility to address the issue could have been introducing the concept of employability, a concept broader than work ability. Originally, this macro-level concept was developed in the post-war period in response to a dire need for labour. At the time, employability interventions were targeted at disabled and disadvantaged groups (Feintuch, 1955). In the context of the current labour market policy, the concept of employability is widely used in Europe to describe the individual's ability to get a job, stay at work, and make progress in his or her career (Cedefop, 2008). The use of the concept of employability is still suitable for addressing the social inclusion of disadvantaged people and the consequences of long-term unemployment and passivity (McQuaid & Lindsay, 2005). According to McQuaid and Lindsay (2005), employability should be understood as an impact of individual characteristics and circumstances, and the wider external (social, institutional, and economic) factors on the individual's ability to work. In their view, a broad approach to employability helps with finding factors that prevent access to work, which may include factors other than individual employment skills. While McQuaid and Lindsay (2005) emphasize employability as a concept extending beyond personal traits, Fugate et al. (2004) describe employability as a psychosocial, individual-centred structure. Their conceptual model of employability combines three dimensions of human ability: adaptability, career identity, and the concepts of social and human capital. They see employability as an active adaptability to work, which enables an individual to find and implement career and employment opportunities. To conclude, the concept of employability is suitable for research among unemployed persons and could work better in illustrating the complex relationship between unemployment and working life.

In addition to conceptual validity, there is a need to briefly discuss the theoretical basis of this study. The fundamental question of this study was concerned with the factors promoting the health and work ability of unemployed persons. The study found factors that were associated with good work ability, i.e. protective factors and this standpoint confirms the application of salutogenesis (Antonovsky, 1988, 1996). What is more, this study assumed that unemployment is one of the most stressful situations a person may face in rich countries and coping with unemployment requires a strong pool of resources. Therefore, along with the salutogenic approach, the conservation of resources theory (Hobfoll, 1989) brings understanding of the mechanisms for gaining, maintaining but also for losing resources.
**Methodological reliability and validity**

The results of this study create new knowledge about the perceived work ability, and associated promoting factors, of unemployed persons. This is the first study to investigate the role of work-related factors, health behaviours, social (social networks, social support, family), and motivational (meaningfulness, belief in working until retirement age) factors in the work ability of unemployed people. The reliability of the results strengthens using randomized population-based large data (N=76,000) with 30,598 participants of whom 1,975 were unemployed (6.5%) or had been laid-off and 13,744 were in full-time employment (44.9%). This number of people and the random distribution of the sample produced results that are generalizable in Finland. Furthermore, data were weighted with inverse probability weighting methods to correct the effects of stratified sampling and non-response (Härkänen et al., 2014).

This study primarily exploited validated and largely used instruments, such as Work Ability Score (WAS), and the self-rated health (SRH), quality of life (EuroHis-QOL), mental health (MHI-5), and alcohol risk use scales (AUDIT). In the analysis phase, the validity of the chosen statistical methods and their results were discussed with a statistician. Results of the sub-study I and II were reported in international peer reviewed journals, which were all classified by the JUFO Publication forum. Conducting a systematic review and meta-analysis according the Cochrane Collaboration’s methods and protocol (Hult et al., 2018) produced reliable, high-quality, and peer-reviewed evidence. The reliability of the systematic review was confirmed by only including randomized controlled trials. Two information specialists elaborated the search plan for the review. To strengthen the review process, an international group with multidisciplinary competence was invited to participate in it. During the review process, the editorial staff of the Cochrane Work Group was consulted on several occasions, translation help was sought out for studies reported in German and Serbian, and the authors of studies were requested to supply additional information to clarify results in an effort to increase reliability.

The use of already collected ATH study data was not without limitations. Detailed research questions for this study were developed with existing ATH data. Thus, all the research questions could not be answered at the desired depth, which is an issue for further research to address. The response rate of the original ATH study was modest, at 40.3%, which slightly undermines the results of the present study. Non-response analysis showed that unmarried men and people with a low level of education were participating the least. A register data from the Statistics Finland (2016) confirms that unemployed people (6.5% in this study population) are underrepresented in the data. In 2014 the unemployment rate was 8.7% and in 2015 9.4% (Statistics Finland, 2016). Furthermore, the reliability of this study may be weakened by the fact that the participants responded by filling out self-administered questionnaires. First, participants may have answered in a socially desirable way, and second, no certainty about the identity of the participant can be obtained. Finally, the analyses were based on cross-sectional data which do not allow the examination
of causes and effects. However, this study suggest possible promoting factors of work ability of unemployed persons.
7 CONCLUSIONS

7.1 CONCLUSIONS FROM MAIN FINDINGS

The findings of this study produced new knowledge of sparsely studied topics, the work ability of unemployed persons, interrelations between health, work ability and employment, and health-improving interventions targeted at unemployed job seekers. Based on this study findings, the following conclusions can be made:

1. Unemployed persons’ perceptions of their work ability are strongly linked to their current health status. However, job satisfaction and work-related load factors of a most recent job continue to affect on perceptions of work ability during a period of unemployment.

2. In addition to being beneficial for health in many ways, physical exercise also promoted work ability in this study results. Exercise also had a direct connection with the employment status, thus it may also help to get a job.

3. Among the employed and unemployed persons, those who had good health were also more likely to have good work ability. The persons with good work ability, in turn, were more likely employed than unemployed. Work ability was a mediator between health and employment.

4. Experiencing life as meaningful, satisfaction, physical activity, and good social relationships are elements of a good quality of life, and they help to maintain a good work ability during unemployment.

5. Health-improving interventions based on a group training and supportive approach produced the best quality evidence of having potential to increase employment among unemployed job seekers. However, health-improving interventions for finding employment were not effective in enhancing health.
7.2 RECOMMENDATIONS FOR FURTHER RESEARCH

1. The work ability of unemployed persons should be studied with longitudinal study designs, using register data among other means, to prove the effects of the protective factors of work ability on re-employment.

2. As work ability assessment was based on perceived work ability (WAS) in this study, it should also be examined with more objective methods (e.g. WAI) among unemployed persons.

3. The role of physical activity to the health, work ability and re-employment of unemployed people should be studied further with follow-up studies because of conflicting evidence. A study by Schuring et al. (2009) showed no effects of physical activity on health and re-employment, while the present study suggested that there might be a positive relation.

4. Future research should investigate the dimensions of the work ability of unemployed persons based on a resource-oriented approach and applying a salutogenic perspective.

5. Both unemployed as well as employed population should also be studied in terms of their employability and whether this influences their health and wellbeing. A shared and univocal definition of the concept of employability should be prepared, and the operationalisation of employability should be developed and tested.

6. There is a need to develop, pilot and assess primary prevention interventions applying resource-based approaches to promote health, work ability, and employability of those employed workers who at the biggest risk of becoming unemployed.

7. The present study showed that there is a need for good quality intervention studies with rigorous designs aimed at unemployed job seekers. To obtain reliable evidence, the interventions should be designed and conducted using methods such as randomization among experimental and control groups as well as blinding and appropriate outcome reporting.

8. This study widely recognized the factors affecting the work ability of unemployed persons. However, these factors should be explored in further detail before giving recommendations for practise.
REFERENCES


Jeong, H.S., Park, S., Lim, S.M., Ma, J., Kang, I., Kim, J., Kim, E.J. et al. 2017. Psychometric properties of the alcohol use disorders identification test-
consumption (AUDIT-C) in public first responders. Substance use and Misuse: 1–7.


Appendix figure 1. Number of unemployed persons in Finland in 2005–2018 (Statistics Finland, 2019a).
APPENDIX 2.

Appendix table 2. Summary of the literature searches on the work ability of unemployed persons.

<table>
<thead>
<tr>
<th>Database</th>
<th>Search terms</th>
<th>Date of search</th>
<th>Results</th>
</tr>
</thead>
<tbody>
<tr>
<td>Scopus</td>
<td>1 TITLE-ABS-KEY(unemploy* or jobless or ((out or lost) W/1 (work* or job* or employ*)))&lt;br&gt;2 TITLE-ABS-KEY(workabilit* or (work W/2 (abilit* OR able)))&lt;br&gt;3 1 and 2</td>
<td>14 Nov 2018</td>
<td>483</td>
</tr>
<tr>
<td>Cinahl and SocINDEX</td>
<td>1 unemploy* or jobless or ((out or lost) N1 (work* or job* or employ*))&lt;br&gt;2 workabilit* or (work N2 (ability* OR able))&lt;br&gt;3 1 and 2</td>
<td>14 Nov 2018</td>
<td>132</td>
</tr>
<tr>
<td>PsycINFO</td>
<td>1 Unemployment/ or unemploy*.mp. or jobless.mp. or ((out or lost) adj1 (work* or job* or employ*)).mp.&lt;br&gt;2 workabilit*.mp. or (work adj2 (ability* OR able)).mp. 3 1 and 2</td>
<td>14 Nov 2018</td>
<td>97</td>
</tr>
<tr>
<td>PubMed</td>
<td>1 Unemployment/ or unemploy*.mp. or jobless.mp. or ((out or lost) adj1 (work* or job* or employ*)).mp.&lt;br&gt;2 workabilit*.mp. or (work adj2 (abilit* OR able)).mp. 3 1 and 2</td>
<td>14 Nov 2018</td>
<td>164</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td></td>
<td></td>
<td><strong>876</strong></td>
</tr>
</tbody>
</table>
APPENDIX 2.

Records identified through database searches (n = 876)

Additional records identified through other sources (n = 3)

Titles screened after duplicates removed (n = 586)

Records excluded (n = 438)
  • No unemployment
  • No work ability

Abstracts screened (n = 150)

Records excluded (n = 113)
  • No unemployment
  • No work ability

Full-text articles assessed for eligibility (n = 34)

Studies included in qualitative synthesis (n = 34)
  • Work ability of unemployed people (n = 8), Appendix 3
  • Work ability and employment status (n = 10), Appendix 4
  • Different patient groups and their employment status (n = 16), Appendix 5

Appendix figure 2. PRISMA flow diagram for the systematic literature search on work ability and unemployment.
### APPENDIX 3.

Appendix table 3. Studies on the work ability of unemployed persons.

<table>
<thead>
<tr>
<th>Study and country</th>
<th>Aim</th>
<th>Study design and data</th>
<th>Results</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hult et al., 2017, Finland</td>
<td>To explore the associations between the quality of life, meaningfulness, and sociodemographic factors with good work ability.</td>
<td>Cross-sectional survey (n = 1,975)</td>
<td>Work ability associated with the quality of life, meaningfulness, high level of education, and short-term unemployment.</td>
</tr>
<tr>
<td>Kerätäär et al., 2016, Finland</td>
<td>To investigate work disabilities and needs for health care and rehabilitation of unemployed people. A further aim was to evaluate the aspects of social functioning as diagnostic tools.</td>
<td>Community-level cross-sectional study. Multidimensional work ability assessments for all unemployed jobseekers in the Paltamo municipality (n = 230)</td>
<td>73% were able to work and 27% were unable to work in the open labour market. 52.6% had good work ability, 20.4% had expected good work ability after return to work activities. 11.7% were able to only work in the transitional labour market and 15.2% were unable to work.</td>
</tr>
<tr>
<td>Kerätäär &amp; Karjalainen, 2010, Finland</td>
<td>To establish which disorders impair work ability, and identify treatment and rehabilitation needs among people with long-term unemployment.</td>
<td>Descriptive case study of the work ability assessment process (n = 1,512)</td>
<td>225 clients were assigned to a rehabilitation physician, and 65% of them had mental disorder impairing their work ability. 34% were recommended a permanent disability pension and only 2% were able to work.</td>
</tr>
<tr>
<td>Laiho et al., 2010, Finland</td>
<td>To evaluate the work ability and willingness to work among unemployed and disabled persons.</td>
<td>Cross-sectional survey (n = 848)</td>
<td>Half of the unemployed participants had excellent or good work ability and around 60% wanted to work. After two years of unemployment, work ability decreased considerably.</td>
</tr>
<tr>
<td>Lappalainen et al., 2017, Finland</td>
<td>To explore the associations between prolonged unemployment, health, and work ability among young unemployed people.</td>
<td>Cross-sectional survey (n = 190)</td>
<td>Male gender, poor work ability, and using drugs were associated with prolonged unemployment.</td>
</tr>
<tr>
<td>Pensola et al., 2008, Finland</td>
<td>To provide a comprehensive overview of work ability at the population level.</td>
<td>The population-based Finnish Health 2000 Survey (n = 5,119), 10% of total unemployed or laid-off population</td>
<td>Long-term or repeated unemployment, a low level of education, and economic problems were associated with decreased work ability. Re-employment improved work ability.</td>
</tr>
</tbody>
</table>

92
<table>
<thead>
<tr>
<th>Study</th>
<th>Title</th>
<th>Design</th>
<th>Methods</th>
<th>Findings</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sziacha et al., 2012, Germany</td>
<td>To examine work ability among specific groups of long-term unemployed persons and compare it with the work ability of the general population.</td>
<td>Cross-sectional survey (n = 530)</td>
<td>Unemployed individuals had poorer work ability compared to those who were employed. Low work ability was associated with health impairments, long-term unemployment, and older age.</td>
<td></td>
</tr>
<tr>
<td>Vastamäki et al., 2014, Germany</td>
<td>To examine the effects of work ability on mental health and to test a causal explanation of work ability, mental health and sense of coherence (SOC).</td>
<td>Longitudinal study with two time points, baseline, and follow-up at six months (n = 98)</td>
<td>Impaired work ability associated with distress and low SOC. Increase in SOC associated with a decrease in distress. SOC mediated the relationship between work ability and distress.</td>
<td></td>
</tr>
</tbody>
</table>
### APPENDIX 4.

Appendix table 4. Studies on association of work ability (WA) and employment status (ES)

<table>
<thead>
<tr>
<th>Study and country</th>
<th>Aim</th>
<th>Study design and data</th>
<th>Results</th>
</tr>
</thead>
<tbody>
<tr>
<td>Betghe et al., 2018, Germany</td>
<td>To examine how WAI predicts rehabilitation measures and disability pensions, sickness absence and unemployment benefits, and work participation.</td>
<td>Study with a 19-month follow-up (n = 2,149)</td>
<td>Poor WAI predicted longer unemployment benefits and fewer employment days.</td>
</tr>
<tr>
<td>Boissonneault &amp; De Beer, 2018, Netherlands</td>
<td>To assess the effect of different WA trajectories on retirement.</td>
<td>Latent class growth modelling (n = 1,417)</td>
<td>Low and declining WA is a risk for unemployment.</td>
</tr>
<tr>
<td>Lee et al., 2017, Republic of Korea</td>
<td>To investigate association between depression and loss of WA by ES.</td>
<td>Panel data (n = 5,241)</td>
<td>Those who lost WA had higher scores on depression. People who lost their jobs and WA had the highest scores. Financial and societal consequences of job loss lead to depression.</td>
</tr>
<tr>
<td>Lundin et al., 2016, Sweden</td>
<td>To investigate how WA predicts ES, and the effect of individual characteristics and labour market factors on ES.</td>
<td>Survey and register study with an 8-year follow-up (n = 12,064)</td>
<td>Poor WA increased the risk of unemployment. Those with poor WA were more often women, younger, had poor health, multisite pain, psychological distress, were working class, with adverse physical and psychosocial working conditions, and were more often smokers and binge drinkers.</td>
</tr>
<tr>
<td>Roelen et al., 2014, Netherlands</td>
<td>To investigate a risk of premature work exit with WAI.</td>
<td>Cohort study with a 2.3-year follow-up (n = 11,534)</td>
<td>Poor WA predicted disability pension but not unemployment.</td>
</tr>
<tr>
<td>van Egmond et al., 2015, Netherlands</td>
<td>To explore barriers and facilitators that cancer survivors with job loss face in return to work.</td>
<td>Focus group interviews (n = 40)</td>
<td>Cancer survivors experienced a loss of job and a loss of health. They feared sending job applications, did not have opportunities to promote their WA, and as job seekers, they felt discriminated by employers.</td>
</tr>
<tr>
<td>Viitanen et al., 2012, Finland</td>
<td>To assess ES and WA, and treatment needs among female prisoners.</td>
<td>Interviews and medical examination (n = 101)</td>
<td>78% were unemployed, 42% unable to work. Reasons for poor WA were substance abuse (70%), mental disorders</td>
</tr>
</tbody>
</table>
(39%) and somatic diseases (23%). 94% had treatment needs for mental disorders.

<table>
<thead>
<tr>
<th>Study</th>
<th>Research Question</th>
<th>Method</th>
<th>Results</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wagenaar et al., 2015, Netherlands</td>
<td>To evaluate how employment contract, age, health, WA, work performance, job satisfaction, and employee investments predict ES.</td>
<td>Survey with 2-year follow-up (n = 2,644)</td>
<td>Those at risk for dismissal included temporary, less healthy, low WA, poor performing, and under-invested workers. After dismissal, older and those with poor health were at risk for long-term unemployment.</td>
</tr>
<tr>
<td>Wagenaar et al., 2012, Netherlands</td>
<td>To test employment trajectories based on health, WA, and work-related well-being.</td>
<td>Cohort study (n = 7,112)</td>
<td>Future unemployment and downward trajectories were predicted by decreased health, high emotional exhaustion, low work-related wellbeing, and low WA.</td>
</tr>
<tr>
<td>Ydreborg &amp; Ekberg, 2004, Sweden</td>
<td>To analyse disability pension decisions.</td>
<td>A register-based retrospective case-control study (n = 99)</td>
<td>Unemployment increased the rejection of disability pension.</td>
</tr>
</tbody>
</table>
APPENDIX 5.

Appendix table 5. Studies on different patient groups and their employment status.

<table>
<thead>
<tr>
<th>Study and country</th>
<th>Aim</th>
<th>Study design and data</th>
<th>Results</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aprato et al., 2016</td>
<td>To test the factors that influence return to work, leaves of absence, and incapacitation after sustaining a pelvic fracture.</td>
<td>Retrospective study. Patients with surgical treatment of an unstable pelvic ring injury (n = 50).</td>
<td>Unemployment rate was 24%.</td>
</tr>
<tr>
<td>Berner et al., 2018</td>
<td>To assess the association between muscle strength, lower extremity function, employment status, and work ability in rheumatoid arthritis patients.</td>
<td>Cross-sectional study. Rheumatoid arthritis patients (n = 100).</td>
<td>Unemployment rate was 41%. Employment was associated with better knee extensor strength and better physical performance. Mean WAS was 7.0.</td>
</tr>
<tr>
<td>Bertin et al., 2016</td>
<td>To evaluate the impact of rheumatoid arthritis on career, productivity, and employability.</td>
<td>Retrospective cross-sectional survey. Rheumatoid arthritis patients (n = 488).</td>
<td>Unemployment rate was 6.4%, on disability benefits 19.1%. Temporary or permanent work discontinuation. Unwillingly downgraded or changed to a different job. Decreased productivity including sick leaves.</td>
</tr>
<tr>
<td>Bethge et al., 2013</td>
<td>To determine whether the Work Ability Index (WAI), a short 7-item self-report questionnaire, predicts application for disability pension.</td>
<td>Cohort study with 3-month follow-up. Chronic back pain patients (n = 294).</td>
<td>Decreased WAI associated with unemployment OR 4.9 (95% CI, 1.5–16.8). Decreased WAI and later application for disability pension OR 15.6 (95% CI, 3.6–68.2), for a long-term sick leave OR 6.0 (95% CI, 2.4–15.2).</td>
</tr>
<tr>
<td>Collado et al., 2014</td>
<td>To analyze the impact of fibromyalgia on family, employment, and social environment.</td>
<td>Cross-sectional study. Fibromyalgia patients (n= 325).</td>
<td>Unemployment rate was 13%, 42% not in labour force.</td>
</tr>
<tr>
<td>Dumas et al., 2016</td>
<td>To analyze the long-term impact of treatment’s late effects on occupational attainment or work ability.</td>
<td>Longitudinal study. Cancer patients (n = 3,512).</td>
<td>Unemployment rate was 28.1% for central nervous system tumor survivors.</td>
</tr>
<tr>
<td>Ho et al., 2018</td>
<td>To explore the determinants of employment and suboptimal work ability, and evaluate the association between work ability and patient-reported physical, psychological, and social outcomes.</td>
<td>Cross-sectional study. Breast cancer survivors (n = 327).</td>
<td>Unemployment rate was 41% in a 1-year follow-up, 52% in a 10-year follow-up. Unemployed survivors were older and had higher levels of general fatigue.</td>
</tr>
<tr>
<td>Law et al., 2016</td>
<td>To examine the employment rate and associated factors in Peritoneal-dialysis patients</td>
<td>Cross-sectional study. Peritoneal-dialysis patients</td>
<td>Unemployment rate was 39.1%. Younger people were more likely to be employed.</td>
</tr>
</tbody>
</table>
### Table

<table>
<thead>
<tr>
<th>Study</th>
<th>Objective</th>
<th>Methodology</th>
<th>Findings</th>
</tr>
</thead>
<tbody>
<tr>
<td>Løve et al., 2016</td>
<td>To examine if non-psychotic psychiatric disorders were associated with future indicators of marginalization and mortality.</td>
<td>Prospective cohort study. Young men (n = 1,609,690).</td>
<td>Risk for long-term unemployment OR 1.97 (95% CI 1.94–2.01).</td>
</tr>
<tr>
<td>Mehnert et al., 2011</td>
<td>To identify current knowledge about employment in cancer survivors.</td>
<td>Systematic review. Studies included (n = 64).</td>
<td>Significantly increased risk for unemployment. Non-employment associated with lower education, female gender, higher age, extensive surgery, advanced tumour and stage, and chemotherapy and radiotherapy.</td>
</tr>
<tr>
<td>Nexo et al., 2014</td>
<td>To evaluate the risk of work disability for patients with thyroid disease compared with the general population.</td>
<td>Longitudinal register study. Thyroid patients (n = 7,043).</td>
<td>Higher risk of disability pension (HR 4.15) and for unemployment (HR 0.52).</td>
</tr>
<tr>
<td>Taponen et al., 2017</td>
<td>To evaluate factors among adults with asthma that are associated with working full-time.</td>
<td>Cross-sectional study. Asthma patients (n = 2,613).</td>
<td>Increased risk for unemployment (OR 2.3, 95% CI 1.3–4.2).</td>
</tr>
<tr>
<td>Thielen et al., 2014</td>
<td>To assess to what extent depressive symptoms and high work demands have an effect on employment consequences.</td>
<td>7-year longitudinal follow-up study. People with depression (n= 5,785).</td>
<td>Increased risk for unemployment. Low education, high physical job demands, chronic back pain, current smoking or high depression predicted unemployment.</td>
</tr>
<tr>
<td>Wo et al., 2015</td>
<td>To explore positive and negative factors affecting the employability in patients with uncontrolled seizures.</td>
<td>Interview study. Epileptic people with uncontrolled seizures (n = 21).</td>
<td>Work ability was affected by education, cognitive and physical functions, ability to cope with disease, self-perceived ability to work, and ability to cope with stress. Employability was enhanced by work ability.</td>
</tr>
<tr>
<td>Wu et al., 2009</td>
<td>To compare the perspectives of employed and unemployed individuals with psychiatric disabilities regarding factors influencing employment.</td>
<td>Cross-sectional study. Unemployed with psychiatric symptoms (n = 209).</td>
<td>Environmental factors (e.g. supportive family) were most important in maintaining employment.</td>
</tr>
<tr>
<td>Åberg, 2016</td>
<td>To summarize literature concerning liver transplantation patients.</td>
<td>Literature review. Studies included (n = 15).</td>
<td>Unemployment rate was 63%. Pre LT-status, male gender, functional and health status, and work ability predicted employment status. Impaired WA by fatigue and depression, also affected by working conditions and society.</td>
</tr>
</tbody>
</table>
This study focused on factors that may promote work ability and health of unemployed people. The results showed that these can be promoted by addressing several individual, social, and work-related factors. Current state of health was predominant in unemployed people’s perceptions of their work ability. The study created a resource model that shows work ability as a part of overall wellbeing. Health-improving interventions should be further developed for the needs of unemployed job seekers.