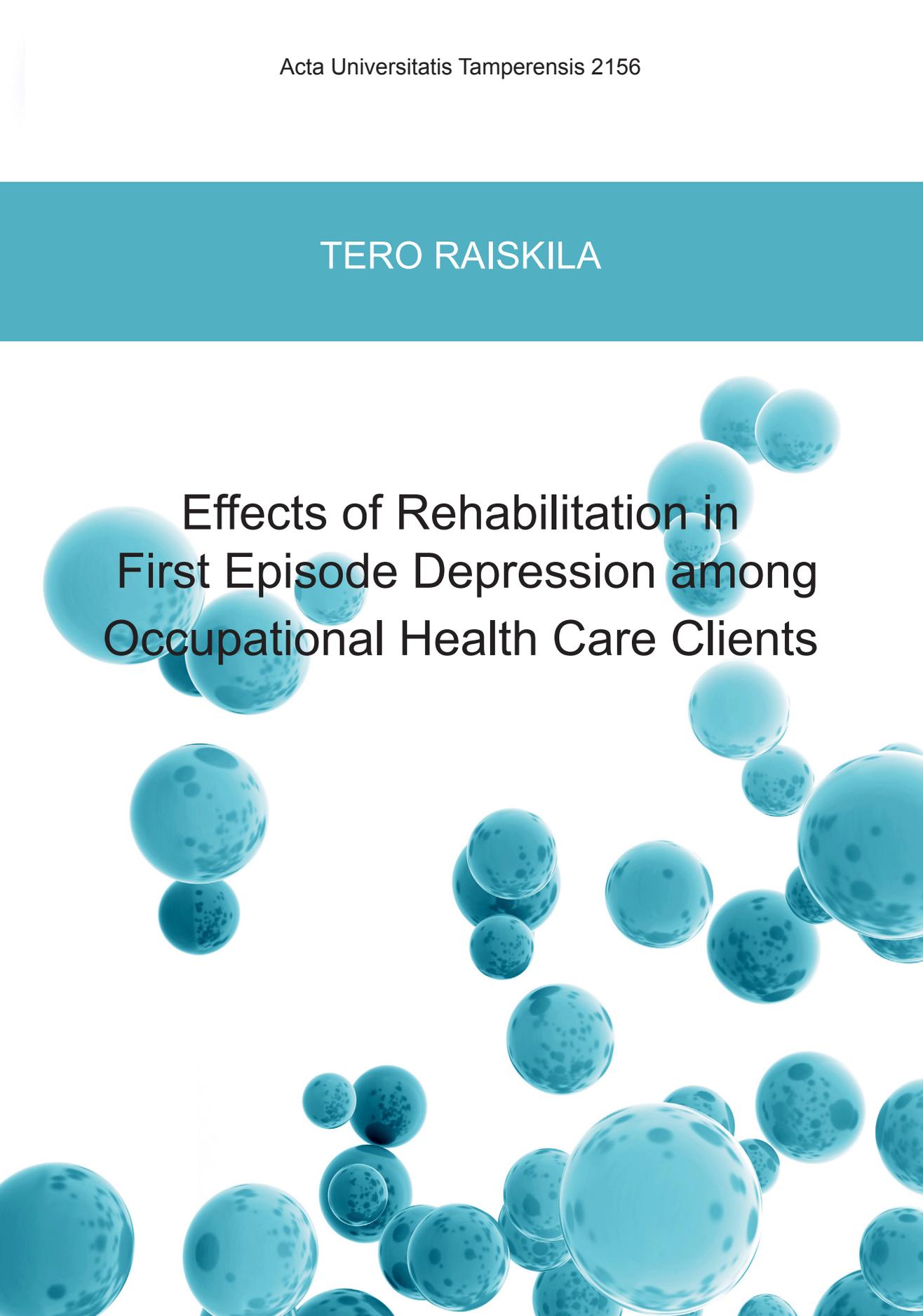


TERO RAISKILA

Effects of Rehabilitation in  
First Episode Depression among  
Occupational Health Care Clients





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ACADEMIC DISSERTATION

To be presented, with the permission of  
the Board of the School of Health Sciences of the University of Tampere,  
for public discussion in the auditorium of School of Health Sciences,  
T building, Medisiinarinkatu 3, Tampere,  
on 22 April 2016, at 12 o'clock.

UNIVERSITY OF TAMPERE

TERO RAISKILA

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*Acta Universitatis Tamperensis 2156*  
*Tampere University Press*  
*Tampere 2016*

## ACADEMIC DISSERTATION

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Cover design by  
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[verkkokauppa@juvenesprint.fi](mailto:verkkokauppa@juvenesprint.fi)  
<https://verkkokauppa.juvenes.fi/>

Acta Universitatis Tamperensis 2156  
ISBN 978-952-03-0090-6 (print)  
ISSN-L 1455-1616  
ISSN 1455-1616

Acta Electronica Universitatis Tamperensis 1655  
ISBN 978-952-03-0091-3 (pdf)  
ISSN 1456-954X  
<http://tampub.uta.fi>

Suomen Yliopistopaino Oy – Juvenes Print  
Tampere 2016

*To my family*



# ABSTRACT

Major depressive disorder is associated with disability and reduced work performance. In Finland, the incidence of depression-related disability pensions has increased during the past decades since the 1980s, but during the last few years the amount has decreased slightly. Psychosocial rehabilitation and psychiatric vocational rehabilitation programmes have been designed to prevent prolonged working disability. In the present project it was possible to investigate the effects of an early rehabilitative intervention programme in first ever episode of depression among occupational health care clients.

The participants (18–64 years) were recruited from occupational health care units in Northern Finland during the years 2004–2009. The inclusion criterion was a lifetime first episode of major depressive disorder according to the DSM-IV. Participants were screened using the Finnish version of the Beck Depression Inventory (BDI). The Structured Clinical Interviews for DSM-IV (SCID I–II) were used as a diagnostic method.

A total of 355 participants were referred to the project. Of them, 275 were suitable according to the inclusion and exclusion criteria. Of these participants, 83% were female. The mean age was 44.0 years for males and 45.2 years for females. Participants were randomized at baseline into intervention and control groups. They were followed for one year. During the one-year follow-up time the experimental group took part in a two-phase multiprofessional rehabilitation programme. The controls were given depression treatment as usual.

The project reports results both from baseline and at one-year follow-up phase. At baseline the main finding was that one third of the participants had obsessive-compulsive PD. The prevalence of obsessive-compulsive PD was 50% among men and 28% among women.

BDI scores decreased both the intervention group and the control group; in the intervention group from 20.8 to 11.6 and in the control group from 19.3 to 10.8. There was some evidence that the intervention was effective as the BDI score decreased by 10 or more points in 64% of the participants in the intervention group and in 53% in the control group ( $P = 0.013$ ).

There was no evidence that the intervention was effective in terms of an alexithymia measure, the Toronto Alexithymia Scale (TAS-20). The prevalence of alexithymia decreased both in the intervention group (from 20.1% to 18.9%) and in the control group (from 16.0% to 7.1%). At the follow-up, the prevalence of alexithymia was found to be significantly lower in the control group than in the intervention group ( $P=0.010$ ).

There was some evidence that the intervention programme had an effect on sense of coherence (SOC). An increase in the mean SOC score was found both in the rehabilitation group and in the control group. There was no significant difference in the mean SOC scores between the groups at the follow-up. The improved SOC was associated with less severe depression and a greater decrease in BDI in the rehabilitation group.

In conclusion, it is important to recognize comorbid PDs when assessing working-age persons experiencing depression, and there was some evidence that early eclectic intervention in first ever episode depression may be more effective than conventional treatments among working-age people in employment.

# TIIVISTELMÄ

Masennus heikentää siihen sairastuneiden henkilöiden työ- ja toimintakykyä ja aiheuttaa inhimillistä kärsimystä. 1980-luvun lopulta alkaen siitä aiheutuvien työkyvyttömyyseläkkeiden määrä on noussut Suomessa viime vuosikymmeninä, kääntyen kuitenkin hienoiseen laskuun viime vuosina. Pitkittyvän työkyvyttömyyden ehkäisemiseksi on kehitetty psykososiaalisia ja psykiatrisesti suuntautuneita ammatillisia kuntoutusohjelmia. Tässä tutkimusprojektissa oli mahdollista selvittää kuntoutusintervention vaikutuksia työterveyshuoltojen asiakkailta, jotka olivat sairastuneet masennukseen ensimmäistä kertaa elämässään.

Tutkimukseen osallistujat (18–64-vuotiaita) koottiin pohjoissuomalaisista työterveyshuoltoyksiköistä vuosina 2004–2009. Sisäänottokriteerinä oli ensimmäinen elämänaikainen masennus, joka määriteltiin DSM-IV:n mukaisesti. Beckin depressiokyselyn (BDI) suomalaista versiota käytettiin masennuksen seulontamenetelmänä ja diagnoosit varmistettiin käyttämällä DSM-IV:n mukaista strukturoitua kliinistä haastattelumenetelmää (SCID I–II).

Tutkimukseen otettiin mukaan yhteensä 355 henkilöä. Heistä 275 täytti sisäänotto- ja poissulkukriteerit. Osallistujista 83 % oli naisia. Miesten keski-ikä oli 44,0 ja naisten 45,2 vuotta. Osallistujat jaettiin lähtötilanteessa satunnaisesti kuntoutus- ja verrokkiryhmiin. Kuntoutusryhmä osallistui vuoden seuranta-aikana moniammatillisesti ohjattuun masennuksen kuntoutusohjelmaan. Verrokkiryhmälle tarjottiin tavanomainen masennuksen hoito. Projektissa raportoidaan tuloksia sekä lähtötilanteessa että vuoden seurannan jälkeen.

Päälöydöksenä lähtötilanteessa oli, että kolmanneksella osallistujista todettiin vaativa persoonallisuus, obsessiivis-kompulsiivinen persoonallisuushäiriö, joka ilmeni 50 %:lla miehistä ja 28 %:lla naisista. BDI-pisteet laskivat kummassakin ryhmässä. Kuntoutusryhmässä pisteet alenivat 20,8:sta 11,6:een ja verrokkiryhmässä 19,3:sta 10,8:aan. Tutkimuksessa saatiin jonkin verran näyttöä kuntoutuksen vaikuttavuudesta arvioituna sillä perusteella, että BDI-pisteet laskivat yli 10 pisteellä 64 %:lla kuntoutukseen osallistuneista ja 53 %:lla verrokkiryhmäläisistä ( $P=0,013$ ).

Kuntoutuksella ei ollut vaikutusta aleksitymiaan Toronto Alexithymia Scale (TAS-20)-kyselylomakkeella mitattuna. Aleksitymian esiintyvyys väheni sekä kuntoutusryhmässä (20,1 %:sta 18,9 %:iin) että verrokkiryhmässä (16 %:sta 7,1 %:iin). Seuranta-ajan jälkeen aleksitymian esiintyvyys oli verrokkiryhmässä merkittävästi alhaisempi kuin kuntoutusryhmässä ( $P=0,010$ ).

Tutkimuksessa oli nähtävissä jonkin verran näyttöä siitä, että sillä oli vaikutusta koherenssin tunteeseen (Sense of coherence, SOC). Sekä kuntoutus- että verrokkiryhmissä SOC-lukemat nousivat, mutta ero ei ollut merkittävä seuranta-ajan puitteissa. Kohentunut koherenssin tunne voitiin liittää kuntoutusryhmässä lievempiin masennuksiin ja suurempiin BDI-pisteiden laskuihin.

Johtopäätöksenä voidaan sanoa, että on tärkeää arvioida depression liittyvä samanaikainen persoonallisuushäiriö työssäkäyvillä ensimmäisen kerran depression sairastuneilla henkilöillä. Lisäksi voidaan todeta, että tutkimuksessa saatiin jossain määrin näyttöä varhaisen eklektisen, useasta kuntoutuksellisesta viitekehystä koostetun masennuksen kuntoutusohjelman vaikuttavuudesta tavanomaiseen hoitoon verrattuna.

# LIST OF ORIGINAL STUDIES

The present thesis is based on the following original studies, referred to in the text by the Roman numerals I–IV.

- I Raiskila T, Blanco Sequeiros S, Kiuttu J, Kauhanen ML, Läksy K, Rissanen P, Vainiemi K, Tuulio-Henriksson A, Veijola J, Joukamaa M. Obsessive-compulsive personality disorder is common among occupational health care clients with depression. *J Occup Environ Med.* 2013 Feb;55(2):168-71.
- II Raiskila T, Blanco Sequeiros S, Kiuttu J, Kauhanen ML, Läksy K, Vainiemi K, Tuulio-Henriksson A, Hakko H, Joukamaa M, Veijola J. The Impact of an Early Eclectic Rehabilitative Intervention on Symptoms in First Episode Depression among Employed People. *Depress Res Treat.* 2013;2013:926562. doi: 10.1155/2013/926562. Epub 2013 Nov 10.
- III Raiskila T, Blanco Sequeiros S, Kiuttu J, Kauhanen M-L, Läksy K, Vainiemi K, Tuulio-Henriksson A, Hakko H, Joukamaa M, Veijola. The Effect of an Early Rehabilitation on Alexithymia among First Ever Depressive Occupational Health Care Clients. *J Depress Anxiety* 3: 161. doi:10.4172/2167-1044.1000161
- IV Valtonen M, Raiskila T, Veijola J, Läksy K, Kauhanen ML, Kiuttu J, Joukamaa M, Hintsala T, Tuulio-Henriksson A. Enhancing sense of coherence via early intervention among depressed occupational health care clients. *Nord J Psychiatry.* 2015 Mar 5:1-8.

The permissions to include original publications in the doctoral thesis are allowed.

# ABBREVIATIONS

APA	American Psychiatric Association
BDI	Beck Depression Inventory
DEPS	The Depression Scale
DSM-IV	Diagnostic and Statistical Manual of Mental Disorders, Fourth Edition
DSM-5	Diagnostic and Statistical Manual of Mental Disorders, Fifth Edition
EERIP	Early Eclectic Rehabilitative Intervention Program
HAM-D	The Hamilton Rating Scale for Depression
ICD 10	International Classification of Diseases, 10th edition
LOCF	Last-observation Carried Forward
MDD	Major Depressive Disorder
MADRS	The Montgomery-Åsberg Depression Rating Scale
NICE	National Institute for Health and Care Excellence
OCPD	Obsessive Compulsive Personality Disorder
PD	Personality Disorder
SCID I	Structured Clinical Interview for DSM-IV Axis I Disorders
SCID II	Structured Clinical Interview for DSM-IV Axis II Disorders
SD	Standard Deviation
SE	Standard Error
SOC	Sense of Coherence
SOFAS	Social and Occupational Functioning Assessment Scale for DSM-IV
SPSS	Statistical Package for the Social Science for Windows
TAS	Toronto Alexithymia Scale
TAU	Treatment as Usual
WHO	World Health Organization

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ABSTRACT

TIIVISTELMÄ

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# 1 INTRODUCTION

Major depression disorder (MDD) was one of the top ten contributors to the global burden of disease between 1990 and 2001 (Ayuso-Mateos et al., 2001; Lopez et al., 2006; Kessler, 2012). By the year 2020, if the current trends for demographic and epidemiological transition continue, the burden of depression will increase to 5.7% of the total burden of disease, becoming the second leading cause of disability-adjusted life years lost, and in the developed regions, depression will be the highest ranking cause of burden of disease (Rose and Abirached, 2013). According to Murray et al. (2012), MDD is the third leading illness in terms of global burden of disease, and causes most disability among non-inflammatory diseases. It is widely distributed in the population, and usually associated with substantial symptom severity and role impairment characterized by high rates of relapse and recurrence (Kessler et al., 2003; Huijbers et al., 2012). According to Craven and Bland (2013), about 10% of primary care patients meet criteria for MDD. Detection and treatment rates in primary care have been found to be low, and treatment quality is frequently inadequate in terms of follow-up and monitoring (Hämäläinen et al., 2004; Hämäläinen et al., 2008; Wolf and Hopko, 2008; Hämäläinen et al., 2009; Pence et al., 2012).

Treatment results in depression are not always satisfactory. According to the STAR D study, the overall cumulative remission rate when using antidepressive medication in the treatment of major depressive disorder (MDD), after four treatment steps, was less than 70% (Rush, 2011).

The severity of major depressive disorder has been associated with unemployment, disability and reduced work performance (Birnbaum et al., 2010). MDD is evaluated to be the fourth most common illness causing functional disability and sickness absence (Wittchen et al., 2011). In Finland, the incidence of depression-related disability pensions over the years 1997–2006, in a registry-based data comprising 272,000 persons per 10,000 person years, was 22 for women and 16 for men (Pensola et al., 2010). In Finland, the incidence of depression-related disability pensions has increased during the past decades since the end of the 1980s, but during the last few years the amount has decreased slightly (Honkonen and Gould, 2011).

Occupational health care professionals have a central role in emphasizing why investing in workplace depression programmes is important, and they are qualified to design and deliver destigmatized, customer-friendly programmes and services for employees to access help with depression (Putnam and McKibbin, 2004).

Psychosocial rehabilitation is an important part of the overall process of successful management of mental illnesses. Several studies have stressed the importance of psychiatric vocational rehabilitation programmes, including supported employment models with high levels of integration of psychiatric and vocational services and different psychosocial interventions designed to prevent prolonged work disability (Cook et al., 2005; Michon et al., 2005; Sullivan et al., 2005). In this series of studies it was possible to investigate the effects of a rehabilitative intervention programme in first ever episode of depression among occupational health care clients.

## 2 REVIEW OF THE LITERATURE

### 2.1 Diagnosis of major depressive disorder

There are two classification of diseases used in psychiatry: the International Statistical Classification of Diseases, 10<sup>th</sup> Edition (ICD 10), (World Health Organization, 2007, Tautiluokitus ICD 10, 2011), and the Diagnostic and Statistical Manual of Mental Disorders (American Psychiatric Association, 2013). The diagnostic criteria of MDD in the Diagnostic and Statistical Manual of Mental Health Disorders, 4<sup>th</sup> Edition (DSM-IV) and in ICD-10 do not differ significantly from each other. In the addition of the two core symptoms in ICD-10 is the loss of energy and two of three core symptoms have to be present. Feelings of worthlessness and unreasonable guilt are defined as separate criteria. In ICD-10 the diagnosis of MDD requires one symptom less than in DSM-IV. Diagnostic criteria in both of the classifications are comparable, the diagnostic threshold for ICD-10 being lower (Andrews et al., 1999).

According to DSM-IV for the diagnoses of MDD, major depressive episodes have to last a minimum of two weeks (American Psychiatric Association, 2000). When diagnosing MDD there have to be five or more symptoms during most of the day or nearly every day, including two core symptoms, i.e., persistent depressive mood or loss of interest or pleasure. Four more symptoms are required for the diagnosis: significant weight or appetite change, insomnia or hypersomnia, psychomotor agitation or retardation, fatigue or loss of energy, feelings of worthlessness or inappropriate guilt, diminished ability to think or to concentrate or indecisiveness, and recurrent thoughts of death or suicidal ideation, or suicide attempt or a specific plan for committing suicide. The symptoms have to cause clinically significant distress or impairment in social, occupational, or other important areas of functioning, and they should not be caused by the direct physiological effects of a substance or a general medical condition, and they should not be better accounted for by bereavement. MDD is classified as mild, moderate or severe (with or without psychotic features). The classification of severity is based on the number and severity of diagnostic criteria symptoms and the degree of functional disability and distress (American Psychiatric Association, 2000). The diagnostic criteria according to DSM-IV and ICD 10 classifications for major depressive disorder are described in Table 1.

The collection of data in this study took place when the DSM-IV system was valid as a diagnostic classification of depression (American Psychiatric Association, 1994). The

current DSM-5 classification (American Psychiatric Association, 2013) does not differ essentially from it. DSM-5 has discarded the multiaxial system of diagnosis, i.e., Axis I disorders and Axis II disorders. Neither the core criterion symptoms applied to the diagnosis of major depressive episode nor the requisite duration of at least 2 weeks has changed from DSM-IV. Criterion A for a major depressive episode in DSM-5 is identical to that of DSM-IV, as is the requirement for clinically significant distress or impairment in social, occupational, or other important areas of life, although this is now listed as Criterion B rather than Criterion C. In DSM-IV, there was an exclusion criterion for a major depressive episode that was applied to depressive symptoms lasting less than 2 months following the death of a loved one (i.e., the bereavement exclusion). This exclusion has been omitted from DSM-5 for several reasons (Gilman et al., 2012; Zisook et al., 2012; American Psychiatric Association, 2013; Wakefield et al., 2013).

Table 1. Diagnostic criteria for MDD according to DSM IV and ICD 10

<p>Diagnostic criteria for DSM IV:          Depressed mood and/or loss of interest or pleasure in life activities for at least 2 weeks and at least five of the following symptoms that cause clinically significant impairment in social, work, or other important areas of functioning almost every day (APA, 2000).</p>	<p>Diagnostic criteria for depression ICD-10 use an agreed list of ten depressive symptoms, (World Health Organization, 2007, Tautiluokitus ICD 10, 2011)</p> <p>At least one of the three symptoms below, most days, most of the time for at least 2 weeks</p>
<p>Key symptoms:</p> <ol style="list-style-type: none"> <li>1. Depressed mood most of the day.</li> <li>2. Diminished interest or pleasure in all or most activities.</li> </ol>	<p>Key symptoms:</p> <ol style="list-style-type: none"> <li>1. Persistent sadness or low mood; and/or</li> <li>2. Loss of interests or pleasure</li> <li>3. Fatigue or low energy</li> </ol>
<ol style="list-style-type: none"> <li>3. Significant unintentional weight loss or gain.</li> <li>4. Insomnia or sleeping too much</li> <li>5. Agitation or psychomotor retardation noticed by others.</li> <li>6. Fatigue or loss of energy.</li> <li>7. Feelings of worthlessness or excessive guilt.</li> <li>8. Diminished ability to think or concentrate, or indecisiveness</li> <li>9. Recurrent thoughts of death</li> </ol>	<ol style="list-style-type: none"> <li>4. Disturbed sleep</li> <li>5. Poor concentration or indecisiveness</li> <li>6. Low self-confidence</li> <li>7. Poor or increased appetite</li> <li>8. Suicidal thoughts or acts</li> <li>9. Agitation or slowing of movements</li> <li>10. Guilt or self blame</li> </ol>

\*if any of above present, at least four associated symptoms

## 2.2 Methods of measuring depression

### 2.2.1 Diagnostic interviews

When assessing mental health disorders, including depression, the clinical interview is the most important tool. For this purpose there are structured interview models in use. The Structured Clinical Interview for DSM-IV Axis I Disorders (SCID-I) is a diagnostic method used to determine DSM-IV Axis I disorders (major mental disorders). The Structured Clinical Interview for DSM-IV Axis II Disorders (SCID-II) is used to determine Axis II disorders (personality disorders), (First et al., 1997a; First et al., 1997b). MDD criteria are included in the SCID-I. The instrument was designed to be administered by a clinician or trained mental health professional, for example a psychologist or medical doctor (Spitzer et al., 1992). This must be someone who has relevant professional training and has experience of performing unstructured, open-ended question, diagnostic evaluations.

While SCID I is a semistructured interview, the World Health Organization Composite International Diagnostic Interview is a comprehensive, fully-structured interview designed to be used by trained lay interviewers for the assessment of mental disorders according to the definitions and criteria of ICD-10 and DSM-IV. The diagnostic section of the interview is based on the World Health Organization's Composite International Diagnostic Interview (1990), (Robins et al., 1988; Blazer et al., 1993; Wittchen, 1994; Andrews and Peters, 1998).

### 2.2.2 Rating scales

The Hamilton Rating Scale for Depression (HAM-D), (Hamilton, 1966) is a multiple item assessment scale used to provide an indication of depression, and as a guide to evaluate recovery (Hedlund and Viewig, 1979). There are two versions of the HAM-D: the original scale (Hamilton, 1960; Hamilton, 1966) and a revised version 1980 (Hamilton, 1980). The HAM-D is designed to be used by trained clinicians (Hamilton, 1960). The assessment is designed for adults and is used to rate the severity of their depression by probing mood, feelings of guilt, suicide ideation, insomnia, agitation or retardation, anxiety, weight loss, and somatic symptoms. The Montgomery-Åsberg Depression Rating Scale (MADRS), (Montgomery and Åsberg, 1979) is a ten-item diagnostic assessment scale to be used by trained psychiatrists or nurses. It measures the severity of depressive episodes in patients with mood disorders.

### 2.2.3 Questionnaires

The Beck Depression Inventory (BDI) is a multiple-choice self-report inventory (Beck et al., 1961). It is one of the most widely used instruments for measuring the severity of depression, based on the patient's own thoughts: items relating to symptoms of depression such as hopelessness and irritability, cognitions such as guilt or feelings of being punished, as well as physical symptoms such as fatigue, weight loss, and lack of interest in sex. The questionnaire consists of twenty-one questions about how the subject has been feeling in the last week. There are a number of versions of the BDI. The most widely used ones are three BDI versions: the original BDI (Beck et al., 1961), the BDI-1A (Beck et al., 1979), and the BDI-II (Beck et al., 1996).

The BDI was originally developed to provide a quantitative assessment of the intensity of depression. It can monitor changes over time and provide a measure for judging improvement (Steer et al., 1999). BDI correlates positively with the Hamilton Depression Rating Scale (Hamilton, 1966) showing good agreement with high one-week test-retest reliability and high internal consistency (Brown et al., 1995; Ambrosini et al., 1991). The correlation between BDI scores and psychiatric interview is strong (Viinamäki et al., 2004; Furlanetto et al., 2005; Veerman et al., 2009). There is a Finnish version of the BDI (Raitasalo and Notkola, 1987).

The Center for Epidemiologic Studies Depression Scale is a questionnaire designed to measure depressive symptomatology in the general population. There exist two versions of the Center for Epidemiologic Studies Depression Scales: the original (Radloff, 1977) and revised versions (Eaton et al., 2004). In Finland, the Depression Scale (DEPS) by Salokangas is a very popular and helpful questionnaire in screening depression (Salokangas et al., 1994). The Patient Health Questionnaire is a self-administered tool with 2 or 9 items. They incorporate DSM-IV depression criteria with other leading major depressive symptoms into brief self-report instruments that are commonly used for screening, as well as selecting and monitoring treatment (Spitzer et al., 1999; Kroenke and Spitzer, 2002; Kroenke et al., 2003). The Major Depression Inventory is a self-report mood questionnaire (Beck et al., 2001) for the measurement of depression, according to both DSM-IV major depression and ICD-10 moderate to severe depression criteria. The Zung Self-Rated Depression Scale, originally called the Self-Rating Depression Scale, is a 20-item self-administered test with the goal of developing a quick and inclusive self-administered tool (Zung, 1965).

## 2.3 Treatment of depression

This literature review of treatment of depression focuses on the management and collaborative care of depression, overall psychotherapeutic interventions and rehabilitation of depression. Psychopharmacological treatment is usually one important cornerstone of

the treatment of depression, but usually not sufficient on its own. The drug treatment of depression is outside the scope of this thesis and has therefore been omitted.

### 2.3.1 Management of depression

Management of depression is a comprehensive task. Depression as an illness and phenomenon is diffuse and diverse (Jacobs, 2013). Treatment programmes aim at complete remission and prevention of relapses and also at prevention of onset (Lecrubier, 2002; McPherson et al., 2005; Barrera et al., 2007; Parker, 2007; Cuijpers et al., 2008; Lau et al., 2008; Möller, 2008; Spadone and Corruble, 2010; Beshai et al., 2011; Biesheuvel-Lelield et al., 2014; van Zoonen et al., 2014). Disease management programmes for depression significantly enhance the quality of care for depressive disorders (Neumeyer-Gromen et al., 2004; Gensichen et al., 2012). When managing the treatment of depression it is important to know whether there is evidence that a specific treatment is more effective than placebo, but also how the treatment options compare to each other (Linde et al., 2011). According to a systematic review by Gilbody et al. (2003) there is substantial potential to improve the management of depression in primary care. Badamgarav et al. (2003) found out in a systematic review that disease management programmes appeared to improve the detection and care of patients with depression. Prevention of depression may become an important approach, in addition to treatment (Cuijbers et al., 2008; Spijker et al., 2012).

Case management is a patient-centred approach which has shown efficacy in the treatment of depression, and it seems to be a promising intervention with potential to bridge the gap of the usually time-limited and fragmented provision of care (Gensichen et al., 2005). Case management is important in the provision of care in general practice, and significant components predicting improvement in the outcome of depressive patients care are the revision of professional roles, the provision of a case manager who provides direct feedback and delivers a psychological therapy, and an intervention that incorporates patient preferences into care (Bortolotti et al., 2008; Christensen et al., 2008). In occupational health care the development of personalized treatment of depression has only just begun in order to achieve a better match between the individual and the treatment received (Cuijpers et al., 2012; Gensichen et al., 2012; Luyten and Blatt, 2012).

Most countries have their own guidelines for treatment of depression (e.g. Canadian Psychiatric Association, 2001; NICE, 2009; Kennedy et al., 2009). In Finland, an edited version of the guidelines for treatment of depression was published in 2014 (Isometsä et al., 2014). The national guideline for treatment of depression in primary care aligns treatment of depression in the occupational health care, which is part of primary care in Finland. Concerning the acute phase of depression, recommended treatments are antidepressive medication and efficient psychotherapies. In the case of severe MDD, pharmacotherapy has a central role. The guideline stresses the importance of psychosocial support. When recovery has occurred after successful treatment, there is still a need for treatment and monitoring of

the situation at least for six months because of the risk of recurrence. The guideline includes a recommendation of the important role of collaborative care; psychiatric consultations and the possibility to use professional psychiatric nurses to achieve a sufficient level in educating, monitoring and providing psychosocial support (Isometsä et al., 2014).

### 2.3.2 Collaborative care of depression

Collaborative care is a structured care method involving a greater role of nonmedical specialists as an augment to support primary care (Gilbody et al., 2006). Collaborative care is associated with improved quality of care, depression outcomes, and improved patient and primary care physician satisfaction (Katon and Seelig, 2008). Recent findings indicate that single interventions have little effect on outcomes in depressive patients, but collaborative care interventions are efficacious in medically ill patients with depression. The results of Cochrane analyses demonstrate significantly greater improvement in depression outcomes for adults with depression treated with the collaborative care model in the short term, medium term, and long term (Archer et al., 2012). Collaborative care programmes for depression have potential to improve the quality of primary care and bring about clinically meaningful improvements in depression outcomes across a broad range of primary care settings and in various populations, settings, and organizations (Craven and Bland, 2006; Gilbody et al., 2006; Christensen et al., 2008; Simon, 2009; Baumeister and Hunter, 2012; Thota et al., 2012; Reilly et al., 2013; Biesheuvel-Leliefeld et al., 2014). When comparing collaborative care applied by the occupational physician care manager, supported by a web-based tracking system and a consultant psychiatrist, with usual care among sick-listed workers with major depressive disorder, collaborative care participants had a shorter time to response than participants receiving usual care (Vlasveld et al., 2013).

Bower et al. (2006) have stressed that “Collaborative care” interventions are effective, but little is known about which aspects of these complex interventions are essential. In the future, collaborative care will focus on the severe, complex or recurrent forms of affective disorder, with an effect especially on work-related functioning and economic productivity (Beekman et al., 2013). Collaborative care for management of depressive disorders is effective in terms of economic value (Jacob et al., 2012). On the other hand, Cleary et al. (2008) did not find compelling evidence to support any psychosocial treatment over another to improve mental state for people with severe mental illness.

Counselling as a potential treatment for mental health problems is associated with significantly greater clinical effectiveness in short-term mental health outcomes compared to usual care, but provides no additional advantages in the long term (Rowland et al., 2001; Bower et al., 2011). Consultation-liaison services, involving mental health professionals working to advice and support primary care professionals in the management of depression in primary care, do not seem to be more effective than usual care (Cape et al., 2010).

### 2.3.3 Psychotherapeutic interventions in treatment of depression

Psychotherapy has many applications for mood disorders (Cuijbers et al., 2005a; De Rubeis et al., 2005; Bond, 2006; Parker, 2007; Bosmans et al., 2008; Cuijpers et al., 2011; Jakobsen et al., 2011; Klein et al., 2011; Knekt et al., 2011; Huntley et al., 2012; Jakobsen et al., 2012b; Luyten and Blatt, 2012; Rodgers et al., 2012). The cognitive therapy has been widely investigated when treating depression (Beck, 1991; Beck, 2005). Interpersonal psychotherapy is a widely used therapy for depression (de Mello et al., 2005; Parker et al., 2006). The evidence of the differences between the treatment effects of psychotherapeutic treatments such as individual interpersonal psychotherapy, brief therapies, non-directive counselling, usual general practice care including discussions with patients and cognitive behavioural therapy varies between different studies (Bower et al., 2000; King et al., 2000; Schulberg et al., 2002; Cuijbers et al., 2005b; Abbass et al., 2006; Brown et al., 2008; Knekt et al., 2008; Cape et al., 2010; Jakobsen et al., 2012b; Knekt et al., 2012; Maljanen et al., 2012; Nieuwsma et al., 2012; van Hees et al., 2013). Combining psychotherapy and antidepressant drug treatment has shown to be effective in treatment for depression (Pampallona et al., 2004; Cuijpers et al., 2009; Jakobsen et al., 2012a; Khan et al., 2012). There is some evidence supporting the effectiveness of computerized cognitive-behavioural therapy for the treatment of mild-to-moderate depression (Kaltenthaler et al., 2008; Spurgeon and Wright, 2010; Sikorski et al., 2011) and the utility of Internet-delivered psychotherapy for depression in adults (Titov, 2011). The Finnish Guideline recommends the use of psychotherapeutic interventions when treating depression (Isometsä et al., 2014).

## 2.4 Depression in occupational health care

### 2.4.1 Prevalence of depression

Depression is common among working-age people (Narrow et al., 2002; Pirkola et al., 2002). The prevalence of depression among Finnish employed persons during the previous year was 5.3% (Honkonen et al., 2007). According to Lehtinen et al. (2005), the estimated annual incidence of depressive disorder and its determinants in the Finnish ODIN sample was about 3%. In 2006 the number of new disability pensions due to depression was 1.5 times the number in the mid-1990s. This is supported by findings from the Health 2011 survey (Markkula et al., 2015). On the other hand, however, depression as an illness does not appear to have become significantly more widespread (Koskinen et al., 2012). Work disability because of depression is a socially challenging problem (Honkonen et al., 2007; Birnbaum, 2010; Wittchen et al., 2011; Lidwall, 2014).

## 2.4.2 Work and depression

Workload is connected with depressive symptoms according to cross-sectional studies (Broadbent, 1985; Bromet et al., 1992; Chevalier et al., 1996, Tennant, 2001; Tsutsumi et al., 2001). The relationship between depression and workplace conditions is of interest because of the negative impact on performance, productivity, work absenteeism, and disability caused by depression (Bender and Farvolden, 2008). An employee with depression is less productive compared with a non-depressive one because of lost productive time (Mausner-Dorsch and Eaton, 2000; Stewart et al., 2003; Lamberg et al., 2010). According to Michie and Williams (2003), key work factors associated with psychological ill health and sickness absence in staff were long hours worked, work overload and pressure, and the effects of these on personal lives; lack of control over work; lack of participation in decision-making; poor social support; and unclear management and work role, and there was some evidence that sickness absence was associated with poor management style. Perception of adverse psychosocial factors in the workplace is related to an elevated risk of subsequent depressive symptoms or major depressive episode (Bonde, 2008).

## 2.4.3 Management of depression in work life

Psychosocial rehabilitation is an important part of the overall process of successful management of mental illnesses. Several studies have suggested vocational rehabilitation programmes to get unemployed persons back to work (Crowther et al., 2001; Marshall et al., 2001; Matschnig et al., 2008; Carriere et al., 2015; Kwam et al., 2014). There is increasing recognition of the importance of psychiatric vocational rehabilitation programmes in helping individuals with severe mental illnesses to find and secure jobs (Michon et al., 2005; Dieterich et al., 2010; Arends et al., 2013). In this respect, supported employment models with high levels of integration of psychiatric and vocational services seem to be more effective (Olsheski et al., 2002; Cook et al., 2005; Hoefsmit et al., 2013; Kinoshita et al., 2013). Evidence of how effective management programmes of depression are is contradictory; according to Nieuwenhuijsen et al. (2008) there is currently no evidence of an effect of medication alone, enhanced primary care, psychological interventions or a combination of these with medication on sickness absence of depressed workers. There are increased attempts to raise the awareness of depression and promote help-seeking behaviour in the workplace, and to deliver destigmatized programmes and services for employees to access help with depression (Putnam and McKibbin, 2004; Charbonneau et al., 2005; Gilbody et al., 2012; Hees et al., 2012). Symptom reduction is crucial to prevent long-term sickness absence (de Vries et al., 2014) and to improve adverse work outcomes in MDD patients with long-term sickness absence (Hees et al., 2013). Long-term symptom remission is predicted by depression severity and long-term return to work after sick leave due to depression. Return to work is also predicted by personal and work-related factors

(de Vries et al., 2012; Hees et al., 2012; de Vries et al., 2014). Achieving early interventions for depression before the onset of sickness absence calls for close integration of primary care, mental health and occupational health care services (Gilbody et al., 2012).

Mental health problems at the workplace seem to be associated with an extensive workload, long working hours, or long night shifts (Rössler, 2012). Comorbid mental disorders pose a high risk for disability pension; other independent predictors of work disability include socio-demographic, clinical, work-related, and treatment factors, but not health behaviour (Ahola et al., 2011). Randomized controlled trials in the workplace are rare and demanding to design and conduct.

#### 2.4.4 Burn out and depression

Professional burnout syndrome is a psychological state resulting from prolonged exposure to job stressors (Shirom, 1989; Schaufeli and Enzmann, 1998; van Dierendonck et al., 2001; Taris et al., 2001; Maslach et al., 2001; Schaufeli et al., 2005; Ahola et al., 2006). It is a concept in occupational health care including emotional and physical exhaustion, depersonalization and decreased personal accomplishment (Brand and Holsboer-Trachsler, 2010), and it can be considered a psycho-social phenomenon occurring as a reaction to particularly strong and long-lasting stressful situations in the workplace (Della Valle et al., 2006). Depression and burnout are common health problems in working populations that complement each other and cover partly overlapping phenomena. Burnout seems to associate more strongly with workload than depression. Depressive disorders are related to job-related burnout (Huttunen, 2000; Reime and Steiner, 2001; Ahola et al., 2005; Tuunainen et al., 2011). In the diagnosis of burnout syndrome self-assessment tools are mainly used, generally the Maslach Burnout Inventory (Maslach and Jackson, 1981; Lourel and Gueguen, 2007). There is no consistent definition of burnout syndrome, there is no defined diagnosis in ICD-10 or in DSM-IV classification, and it is not a reason for sick leave in Finland. However, it is widely used in clinical practice, especially in occupational health care (Korczak et al., 2010; Kaschka et al., 2011). Burnout is a work-related syndrome associated with serious individual and social consequences, and there is a need to distinguish it from depression, alexithymia, feeling unwell, and the concept of prolonged exhaustion (Martila et al., 2007; Korczak and Huber, 2012).

### 2.5 Studies exploring the effectiveness of treatment of depression in the occupational health care setting

In Finland, occupational health care is preventive in nature, and part of basic health care providing services for employed people and taking care of welfare in the workplace (Occupational Health Care Act, 1383/2001). Adjuvant occupational therapy containing

18 sessions increased long-term depression recovery (Hees et al., 2013). Low-intensity psychological interventions have been used for the secondary prevention of relapse after depression, but the evidence of the clinical effectiveness is still inadequate (Rodgers et al., 2012). The chronicity of personality disorders can usefully guide treatment planning, and psychotherapy for personality disorders can focus on rehabilitation (Paris, 2003). A review by Baumeister and Hutter (2012) concluded that single interventions have little effect on outcomes in depressive patients. Instead, collaborative care interventions that focus on the work and family relations of an individual and involve occupational health care workers and staff from psychiatric and psychological facilities are efficacious in patients with depression. In contrast, a systematic review by Furlan et al. (2012) concluded that there is insufficient evidence to determine which interventions are effective in managing depression in the workplace. Achieving early interventions for depression before the onset of sickness absence calls for close integration of primary care, mental health and occupational health services (Gilbody et al., 2012).

Some studies stress the importance of psychiatric vocational rehabilitation programmes, including supported employment models with high levels of integration of psychiatric and vocational services and different psychosocial interventions designed to prevent prolonged work disability (Merza et al., 2001; Olshelskia et al., 2002; Cook et al., 2005; Michon et al., 2005; Sullivan et al., 2005).

The positive influence of the interventions in managing depression has been observed in various studies (Sullivan et al., 2006; Wang et al., 2007; Hees et al., 2010; Lexis et al., 2011; Lind et al., 2011; Stenlund et al., 2012). A resource-building group intervention used to strengthen recovery from depression has been shown to improve mental health among employees with elevated levels of depression (Vuori et al., 2012). However, a systematic review by Furlan et al. (2012) concluded that, to date, there is insufficient evidence to determine which interventions are effective in managing depression in the workplace. A recent Finnish cohort study of 50,000 employees conducted by Saltytchev (2012) did not find any evidence of the effectiveness of vocationally oriented medical rehabilitation amongst public sector employees. Andrea et al. (2009) have encouraged the use of intervention studies to test whether changes in the workplace or in the psychosocial work environment reduce depressive symptoms among employees. Dietrich et al. (2012) have suggested that more tailored interventions, targeting depression directly, are needed in the workplace. There is a need for new strategies in clinical practice with regard to the psychosocial work environment and disability due to mental disorders (Joensuu et al., 2010; Lagerveld et al., 2010; Corbière et al., 2011; Cornelius et al., 2011). Other workers and lay people may show ignorance with regard to the causes and treatment of mental disorders (Furnham, 2009). Peer support interventions vs. usual care have been shown to be superior in reducing symptoms of depression (Pfeiffer et al., 2011).

## 2.6 Personality disorders and depression

### 2.6.1 Comorbidity of personality disorders and depression

Personality disorders affect how a person thinks and behaves, making it hard for her or him to live a normal life. People diagnosed with personality disorder may be very inflexible – they may have a narrow range of attitudes, behaviours and coping mechanisms which they are not able to change easily, if at all. They may not understand why they need to change, as they do not feel they have a problem. PDs are very deep-rooted, and therefore hard to treat, but people can be helped to manage their difficulties (Grilo et al., 2004; Bloom et al., 2012; Kröger et al., 2013; Bales et al., 2014; Carlier et al., 2014).

Depending on the diagnosis, severity and the individual, and the job itself, personality disorders can be associated with difficulty coping with work or the workplace – potentially leading to problems with others by interfering with interpersonal relationships (Ettner et al., 2011).

In general population, the point prevalence of personality disorders is 10%, but the lifetime prevalence is probably 30–40% (Torgersen, 2009). It has been estimated that about half of psychiatric inpatients and outpatients with a current MDD have a comorbid PD (Mulder, 2004). Personality disorders are a group of conditions characterized by an inability to get on with other people and learn from experience, characterized by enduring maladaptive patterns of behaviour, cognition and inner experience, exhibited across many contexts and deviating markedly from those accepted by the individual's culture. Personality disorders usually become apparent in adolescence or early adulthood, although they can start in childhood. These patterns are inflexible and are associated with significant distress or disability (American Psychiatric Association, 2013).

The comorbidity of MDD with anxiety disorders, substance abuse (Pirkola et al., 2005) and PDs is quite common (Kantojärvi et al., 2006; Vuorilehto et al., 2005). Co-occurring PDs contribute significantly to impairment in social and emotional functioning and reduce well-being in patients with MDD (Skodol et al., 2002; Skodol et al., 2005a; Newton-Howes et al., 2006; Korkeila et al., 2011). In a Finnish study, severity of depression and existing comorbid PD were the two most important predictors of longer episode duration and recurrence of depression (Melartin et al., 2004). The most common comorbid personality disorders with subjects suffering from depression have been avoidant, borderline and paranoid personality disorder (Rossi et al., 2001; Fava et al., 2002; Melartin et al., 2002; Markowitz et al., 2005). PDs are more stable than major depressive disorder (Skodol et al., 2005c). Skodol et al. (2011) proposed that personality psychopathology should be assessed in all patients with MDD. Consideration of personality features is crucial to the understanding and management of major depression (Bagby et al., 2008). The presence of personality disorders hinders alleviation of depressive symptoms in major depression (Hintikka et al., 2002). Diagnosing personality disorders during a depressive episode is difficult because depression can include symptoms strongly suggestive

of PD (Viinamäki et al., 2006). On the other hand, Michels (2010) presents that the assessment of personality is an important part of the assessment of any depressed patient and can be performed during a depressed episode. Stuart et al. (1992) have discussed if personality assessments are valid in acute major depressive disorder.

## 2.6.2 Obsessive Compulsive Personality Disorder and depression

Obsessive-compulsive personality disorder (OCPD) is a pattern of preoccupation with orderliness, perfectionism, and control. It can be assumed that subjects with OCPD can overload their work tasks. They emphasize order, perfection and controlling of experiences and interactions at the expense of flexibility, transparency and greater efficiency (American Psychiatric Association, 2006).

The prevalence of OCPD may be rather high (0–20%) among subjects with depressive disorders (Corruble et al., 1996). According to a Finnish study with 269 depressive patients, one third had anxious or fearful personality disorder, disorders, including OCPD (Mantere et al., 2006). According to Zimmerman et al. (2005), about ten per cent of more than eight hundred out-patients with major depression had OCPD. The prevalence of OCPD has been about ten per cent among depressive psychiatric patients (Zimmerman et al., 2005). In a large population study in the USA with 43,000 adults the lifetime prevalence of OCPD was 7.8%, with the same rates for men and women (Grant et al., 2012). According to a Norwegian population study with more than 2,000 individuals the prevalence of OCPD was twice as common in men as in women (Torgersen et al., 2001). It has been stated that the distribution in prevalence of PDs is different in US and European/Nordic studies (Coid et al., 2006; Lentzenweger et al., 2007).

It has been found that MDD and PDs are linked together. The direction of the causality is, however, not clear. PDs usually lead to MDD, but in some cases, depression may influence personality pathology, and may even lead to PDs (Farabaugh et al., 2005). MDD may maintain a PD diagnosis such as OCPD compared with patients initially diagnosed with MDD alone (Farabaugh et al., 2005). Specific PD comorbidity might affect the course of MDD by modulating factors that increase the overall risk of depression (Candrian et al., 2008). PDs predict relapse after remission from an episode of MDD (Grilo et al., 2010). Some positive association has even been found between suicidal behaviour and OCPD among depressed patients (Diaconu and Turecki, 2009). It has been suggested that in OCPD patients the impairment in general functioning, and particularly in social functioning, would be stable (Skodol et al., 2005a).

## 2.7 Alexithymia and depression

Alexithymia (“no words for feelings”) is a multidimensional concept and a personality trait characterized by deficits in regulating, experiencing, identifying feelings and communicating emotions and has been assumed to be associated with a tendency to express emotional arousal through somatization (Sifneos, 1966; Nemiah and Sifneos, 1970; Sifneos, 1973). The construct of alexithymia encompasses a limited imaginal capacity. In other words, alexithymia refers to a specific disturbance in psychic functioning characterized by difficulties in the capacity to verbalize affects and to elaborate fantasies (Taylor, 1984; Bertagne, 1992; Taylor, 2000; Farges et al., 2004).

Alexithymia is quite common among working-age people; its prevalence has been shown to be about 9%–17% for men and 5%–10% for women (Salminen et al., 1999; Honkalampi et al., 2000; Kokkonen et al., 2001; Mattila et al., 2006). Alexithymia is also associated with older age, lower socioeconomic status, and fewer years of education (Lane et al., 1998; Mattila et al., 2006). The alexithymia construct has been assumed to be a stable personality trait rather than a state-dependent phenomenon (Wise et al., 1995; Luminet et al., 2001; Luminet et al., 2007; de Timary et al., 2008), and alexithymia behaves like a stable personality trait in the general population (Salminen et al., 2006). According to Tolmunen et al. (2011), both the absolute and relative stability of alexithymia in the general population are high, even over a long follow-up period.

Alexithymia and depression are highly associated (Parker et al., 1991; Honkalampi et al., 2000; Honkalampi et al., 2001; Bamonti et al., 2010; Honkalampi et al., 2010; Bonnet et al., 2012; Luca et al., 2013) and alexithymia may increase vulnerability to depressive symptoms (Tolmunen et al., 2011; Leweke et al., 2012). Patients with poor or no insight are more alexithymic than patients with excellent, good and moderate insight (De Berardis et al., 2005). Alexithymia has been found to be a risk factor for several somatic, psychosomatic, and psychiatric disorders including depression (Zeitlin and McNally, 1993; Råstam et al., 1997; Lumley et al., 2002; De Gught and Heiser, 2003; Duddu et al., 2003; Larsen et al., 2003; Sayar et al., 2004; Mattila et al., 2007; Mattila et al., 2008; Willemsen et al., 2008; Saharinen et al., 2008; Honkalampi et al., 2010; Baiardini et al., 2011; Honkalampi et al., 2011; Grynberg et al., 2012; Son et al., 2012; von Rimscha et al., 2012). There is some indication that the stability of alexithymic features has a negative effect on antidepressant treatment in depression (Ozsahin et al., 2003). During a multimodal psychodynamic treatment, the symptom load and alexithymia decreased (Stingl et al., 2008). A comprehensive, integrated group therapy programme can bring about a change in alexithymia (Grabe et al., 2008; Rufer, 2010; Ogrodniczuk et al., 2011). There are studies concerning the effect on an early rehabilitative intervention programme focusing on depressive symptoms and working ability (Sullivan et al., 2006; Lexis et al., 2011; Lind et al., 2011; Stenlund et al., 2012). The effect of rehabilitative interventions in subjects with alexithymia has mainly been studied with somatic diseases (Mazzarella et al., 2010; Jackson

and Emery, 2013; Wood and Doughty, 2013). Recovery from depression is associated with decrease in alexithymic features (Saarijärvi et al., 2001).

## 2.8 Sense of coherence and depression

Sense of coherence (SOC) is sociologist Aaron Antonovsky's concept for an orientation to view the environment as comprehensible, manageable and meaningful (Antonovsky, 1979; 1987). It is based on his salutogenic theory assuming that the way people cope has an influence on their health and is widely accepted in the research field as a health-predicting concept (Eriksson and Lindström, 2005). Still, there are only few studies that examine the change of SOC in an intervention setting. This could be explained by Antonovsky's assumption that SOC as measured using the Sense of Coherence questionnaire developed by him (Antonovsky, 1979; 1987) is comparatively stable over time, at least after age 30. He also suggested that the achieved level of SOC is assumed to play a role in the stability of the SOC: stability was hypothesized to be more constant among people with a high SOC than those with a low SOC.

Antonovsky's theory (Antonovsky, 1979; 1987) assumes that effective coping is less likely for low than for high-SOC persons. This theory did not get support in a study on the development of SOC (Feldt et al., 2011) where an increasing trend was found in the SOC among individuals with low SOC ("low SOC—increasing trend"). SOC can be considered a powerful impact on the process of coping, and a person with high SOC is less vulnerable and less sensitive to stress because of more effective coping skills than a person with low SOC (Antonovsky, 1987). SOC may explain why some people become ill under stress whereas others remain healthy, and it is strongly related to perceived health, particularly mental health (Kivimäki et al., 2002; Eriksson and Lindström, 2006; Li et al., 2014).

SOC is considered a modifier of occupational stress (Urakawa and Yokohama, 2009; Sairenchi et al., 2011; Urakawa et al., 2012), but the impact of work stressors on SOC is not well known. In a study of Swedish rural men a strong negative correlation was found between SOC and job demand. A positive correlation with job control was demonstrated in a study where SOC was shown to be strongly correlated with work-related psychosocial factors and social support, but independent of sociodemographic factors such as education and occupation (Holmberg et al., 2004). SOC can be seen as a relatively stable (trait) measure (Schnyder et al., 2000). Nilsson et al. (2003) found that SOC was only stable for those with initially high levels of SOC. Although there are only few intervention studies that show change in SOC, it is reasonable to assume that interventions improving psychological adjustment could enhance SOC. The stability of the SOC was studied in an intervention programme designed to boost re-employment, and it was found that SOC improved significantly among those in the intervention programme (Vastamäki et al., 2011). The development of SOC among employees working in different public service occupations was investigated during three different group psychotherapy interventions

comparing them with controls (Kähönen et al., 2012). Change in SOC between the three therapy groups and controls was significant, indicating that it is possible to improve SOC by group intervention.

Severity of depression has been found to associate with the level of SOC. Carstens and Spangenberg (1997) found a significant negative correlation between scores on BDI and total scores on the SOC scale. SOC seems to be a predictor of depressiveness amongst age, gender, education, marital and employment status (Zboralski et al., 2006; Klepp et al., 2007; Välimäki et al., 2009; Berg, 2010; Erim et al., 2011; Mattisson et al., 2014; Pillay et al., 2014). Kivimäki et al. (2000) found in a longitudinal study that especially in women a low SOC was associated with health prospects. It has been shown that men and women with depressive symptoms have a poorer SOC than others (Kerstis et al., 2013), and that SOC is also associated with other psychiatric disorders (Takaki and Ishii, 2013).

Even though an association between SOC and depression has been observed in some studies, SOC as a construct is not entirely explained by depression or any other trait variable (Cohen and Savaya, 2003; Weissbecker et al., 2002). Ito et al. (2015) have proposed SOC to be a useful and easy-to-use predictor of future depression and mental health (Luutonen et al., 2011) and of remission after therapeutic treatment (Marttunen et al., 2008). Griffiths et al. (2011) have proposed the possibility that SOC strength is not an overall adaptive capacity measure which can be applied with equal effectiveness to all challenges/problems experienced in life.

Concerning psychotherapy, Antonovsky (1979) theorized that it is unlikely to be expected that even a series of encounters between a client and clinician could significantly change SOC. Contrary to Antonovsky's theory, there are some studies that show changes in SOC when confronting stressful life events. Szymona (2005) found in a study among neurotic patients treated for 10 weeks with psychotherapy that an increase in SOC level was observed specifically in patients with a low SOC level at the beginning of the treatment. The change in SOC and its association with the severity of depression was studied among old non-demented persons 12 months after hospitalization (Helvik et al., 2013). It was found that SOC improved from baseline to the one-year follow-up, and the improved SOC was associated with a reduction of symptoms of depression. Another recent study (Lövheim et al., 2013) aimed to describe the changes in SOC in old age in a 5-year follow-up. A significant correlation between accumulation of negative life events and decrease in SOC was found. In a longitudinal four-year study among Canadian labour force, 35.4% of the participants reported changes in SOC, 58% of them reporting a change greater than 10% (Smith et al., 2003).

### 3 AIMS OF THE STUDY

In the baseline phase, this study investigated how common personality disorders are among 272 employed subjects with first episode depression. In the follow-up phase after one year, the effect on an early vocationally orientated, eclectic intervention was compared to treatment as usual on depression, alexithymia and sense of coherence in first ever episode depression among 283 employed subjects. They were collected from occupational health care units in Northern Finland. The study was carried out in a context consisting of occupational health care, rehabilitation and psychiatry. Psychosocial rehabilitation and psychiatric oriented vocational rehabilitation have not been an intensively studied field in spite of having a well-established status in Finland. The aims of this series of studies were to answer the following questions.

1. The occurrence of obsessive-compulsive personality disorder in people with depression among occupational health care clients? (Study I)
2. How does an early rehabilitation programme affect depression? (Study II)
3. How does an early rehabilitation programme affect alexithymia in depressive health care clients? (Study III)
4. How does an early rehabilitation programme affect the sense of coherence in depressive health care clients? (Study IV)

## 4 SUBJECTS AND METHODS

### 4.1 Design

These studies form part of the rehabilitation intervention study project aiming to find out the effectiveness of early rehabilitation of first ever depressive disorders among employed persons (18–64 years) in Finland. The participants were recruited from 18 occupational health care units in Northern Finland during the years 2004–2009. Eligible subjects were randomized into an experimental and a control group. The randomization was conducted by drawing a ticket. The experimental group took part in a short two-phase rehabilitation programme; the controls were given depression treatment as usual (Figure 1).

### 4.2 Subjects

The participants were recruited from occupational health care units with about 120,840 clients (Figure 1). The first study deals with the baseline situation of participants of both the experimental and control groups pooled together. A total of 355 participants were referred to the project. Of them, 272 were suitable according to the inclusion and exclusion criteria. Of these participants 226 (83%) were female and 46 (17%) male. The mean age was 44.0 years (standard deviation=SD 10.2) for males and 45.2 years for females (SD=8.1) without a significant difference ( $p=0.381$ ). In the three intervention studies a total of 355 subjects were referred to the project, and 283 of them were randomized into the intervention ( $N=142$ ) and control groups ( $N=141$ ), (Figure 1). Eight of the subjects were excluded at the baseline, so the number of participants was 275; 141 in the intervention group and 134 in the control group. After one year of follow up, excluding the dropouts, seven in the intervention and 34 in the control group, the intervention group consisted of 134 participants, 79.1% of them female, while the control group had 100 participants, 92.0% of them female.

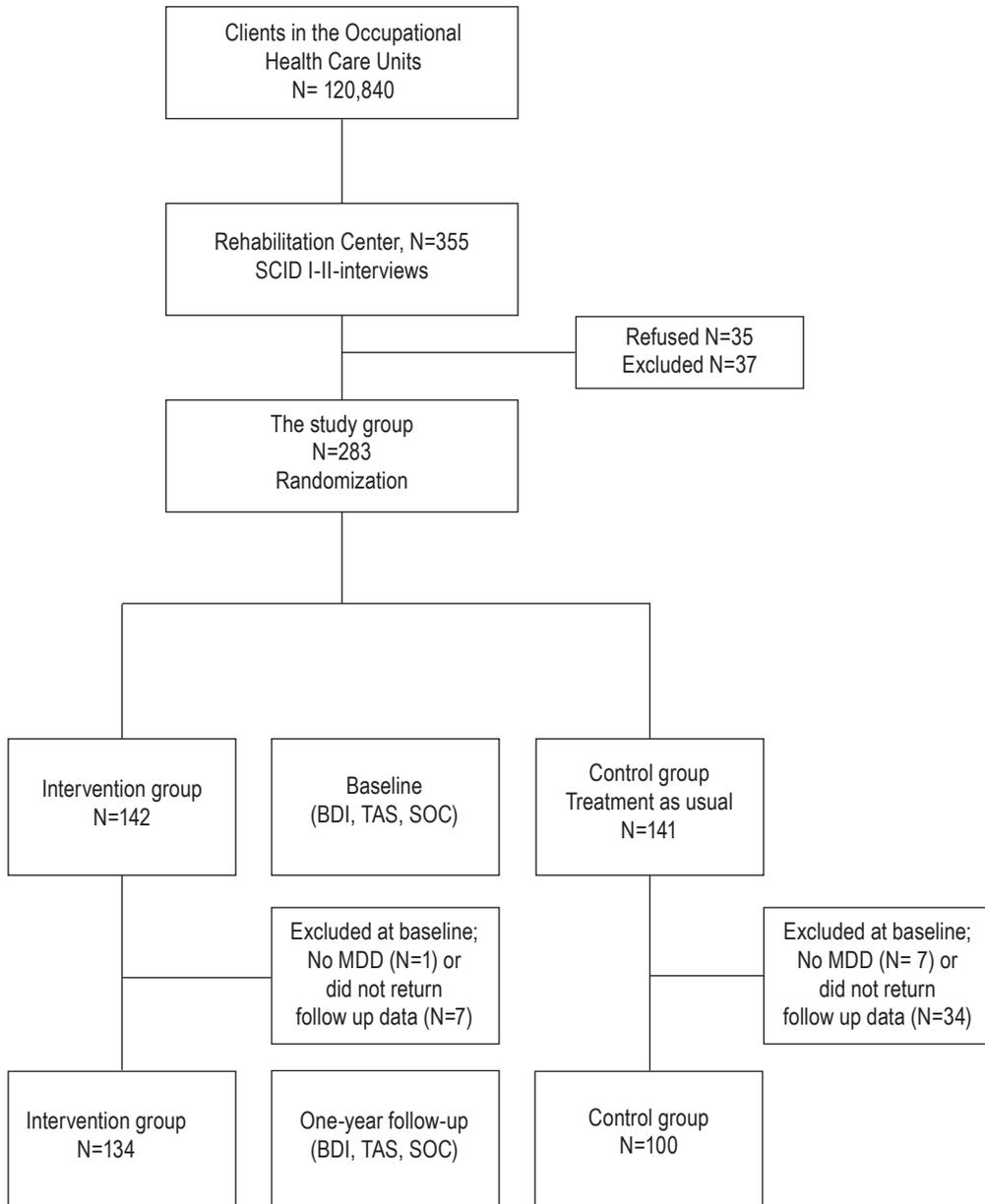


Figure 1. Flow chart of the intervention study (subjects)

### 4.3 Inclusion and exclusion criteria

The inclusion criterion was a lifetime first episode of major depressive disorder (MDD) according to the DSM IV. Occupational health care physicians and nurses were asked to recruit patients for the project. Participants were screened using the Finnish version of the Beck Depression Inventory (Beck et al., 1961; Raitasalo and Notkola, 1987) using the cut-off point >9. For the current depressive episode, antidepressive drug use for less than six months and/or sick leave for less than one month were allowed. Exclusion criteria included: schizophrenia group disorders, organic mental disorders or substance abuse disorders, mental retardation, and depression that could not be treated in occupational health care services (psychotic symptoms or high suicide risk) or that required hospitalization. After being given a description of the study, all participants provided written informed consent. The ethical committee of the Northern Ostrobothnia Hospital District approved the study in 2004.

### 4.4 Methods

The Structured Clinical Interviews for DSM-IV (SCID I–II), (First et al., 1997a; First et al., 1997b) were used as a diagnostic method. The interview consists of two parts: SCID I for Axis I -disorders and SCID II for personality disorders. The SCID interviews were conducted by trained and experienced interviewers. All cases were reviewed together with a senior researcher, who has long experience of using the SCID.

In study I personality disorders were diagnosed using the SCID II interview. The Social and Occupational Assessment Scale (SOFAS) (American Psychiatric Association, 1994) was used to measure social and occupational functioning. SOFAS scores of 40 to 50 represent the range from major to serious, 60 to 70 to moderate to some, and 80 to 90 light impairment to good functioning.

The severity of depression at baseline was defined in the SCID I interviews as mild, moderate or severe, and using the Finnish version of the BDI (Beck et al., 1961; Raitasalo and Notkola, 1987). The range of the BDI score is 0–63; 0–9 indicating no depression, 10–16 mild depression, 17–29 moderate and 30–63 severe depression. In study II the outcome of the participants during the one-year follow-up period was determined using the BDI. Differences in the BDI between the intervention and control groups, and any changes during the one-year follow-up, were analysed using four outcome measures based on the sum score of the BDI. Firstly, the proportion of participants whose BDI score was less than 10 points (i.e., no depression) at the end of the one-year follow-up was recorded. Secondly, the proportion of subjects whose BDI score had decreased more than 50% during the follow-up was examined. Thirdly, the proportion of subjects whose BDI score had decreased by more than 9 points during the follow-up was calculated. Finally, the change in mean sum score of the BDI was analysed.

In study III the 20-item version of the Toronto Alexithymia Scale (TAS-20) was used as the measure of alexithymia. Of the different methods for measuring alexithymia, the TAS-20 is the most widely used and presumably the most carefully validated one. Its internal consistency, test-retest reliability, convergent, discriminant, and concurrent validity have been demonstrated to be good (Bagby et al., 1994a; Bagby et al., 1994b; Parker et al., 2003; Taylor et al., 2003). The psychometric properties of the Finnish version of the TAS-20 have been shown to be satisfactory (Joukamaa et al., 2001). The items are rated on a 5-point scale ranging from “strongly disagree” to “strongly agree”. According to the recommendation by the developers of the scale, the cut-off point of alexithymia was also used: TAS-20 total scores >60 are defined as alexithymic (Bagby et al., 1994a; Bagby et al., 1994b). The TAS-20 has a three-factor structure: TAS factor 1 assesses difficulty in identifying feelings (=DIF), TAS factor 2 concerns itself with difficulty in describing feelings (=DDF), and TAS factor 3 reflects externally-oriented thinking (=EOT) (Bagby et al., 1994a; Bagby et al., 1994b).

In study IV as an outcome measure for sense of coherence was used in the SOC-13 questionnaire. It consists of four meaningfulness items, five comprehensibility items and four manageability items and is based on the original 29-item scale (Antonovsky, 1993). Participants were asked to select a response on a 7-point semantic differential scale with two anchoring phrases. Using the answers on these scales, a sum score was calculated. The total possible score is 13–91, higher scores indicating a stronger SOC. In meta-analysis, the alpha values in 127 studies using SOC-13 range from 0.70 to 0.92, and in 60 studies using a modified SOC scale from 0.35 to 0.91. Test-retest correlation show stability and range from 0.69 to 0.78 (1 year), 0.64 (3 years), 0.42 to 0.45 (4 years), 0.59 to 0.67 (5 years) to 0.54 (10 years), (Eriksson and Lindström, 2005). The SOC scale seems to be a reliable, valid, and cross-culturally applicable instrument measuring how people manage stressful situations and stay well (Flannery et al., 1994; Eriksson and Lindström, 2005; Flensbor-Madsen et al., 2005; Feldt et al., 2007).

The basic sociodemographic information and details of their current work situation were gathered with a questionnaire as part of the baseline data collection. Marital status was dichotomized: married or cohabiting vs. others. Basic education was categorized into three groups according to the length of education: less than nine years, nine years (comprehensive school) and more than nine years. Vocational education was categorized into three groups according to the level and length of education. In the first group were the subjects with the lowest or no vocational education, in the second group subjects with polytechnic education, and in the highest group subjects with a degree from university or university of applied sciences. Social class was defined on a nine-level Finnish classification based on the social appreciation of professions (Rauhala, 1966) and categorized into three groups.

## 4.5 Early Eclectic Rehabilitative Intervention Program (EERIP)

The rehabilitation process was implemented by a multiprofessional working group consisting of a psychologist, social worker, psychiatrist, physician and physiotherapist in a rehabilitation institute. The working group remained the same 2004–2009. The intervention consisted of two courses. The first was called the Research Course and the second the Rehabilitation Course. The whole rehabilitation process took 6 months and included 31 active days. The Research Courses focused on individual predictors of depression, which varied from work-related and family-related stressors to person-related stressors. Based on individual stressors, each participant was given tasks to be completed during the whole rehabilitation process. The courses were conducted in groups including 3–5 participants. They consisted of two 5-day periods with a 3- to 4-week interval. During the interval the participants focused on their individual tasks (Kauhanen et al., 2002). The Rehabilitation Courses were arranged 3–4 months after the research courses. They consisted of one 14-day and one 7-day period with a 3- to 4-week interval and were performed in groups including 5–8 participants, not necessarily the same group as in the Research Courses. The group working methods were based on eclectic practice including both cognitive behavioural and psychodynamic principles (Kauhanen et al., 2002). Participants stayed at the ODL institute away from their normal circumstances during the courses.

The aims of both the Research and Rehabilitation courses were to increase the self-knowledge of depression and to get peer support and social support. In the case of work-related stressors collaboration with workplaces and occupational health care services was included in the process. This meant visits by the staff to the participants' workplace, with possible recommendations for changes in the work content to reduce work strain.

A psychophysical physiotherapeutic approach to depression was adopted as a background theory emphasizing the interaction between mind and body. The aim was that the depressed participants could, through physical and body training and by using relaxing techniques, recognize the significance of body reactions (Rundcrantz et al., 1991; Monsen, 1992; Roxendal, 2002). At the individual level, a moderate amount of exercise can reduce the risk of developing depression (Salmon, 2001; Teychenne et al., 2008; Mammen et al., 2013; Isometsä et al., 2014). There has been considerable research interest in the effects of exercise upon depression outcomes (Barbour et al., 2007; Greer and Trivedi, 2009; Marije aan het Rot et al., 2009; Mead et al., 2009; Perraton et al., 2010; Daley, 2008; Schuch et al., 2015). According to the Finnish guideline, subjects with depression may benefit from exercise alone or in a group as part of the total care of depression (Isometsä et al., 2014). According to Rimer et al. (2012), exercise seems to improve depressive symptoms in people with a diagnosis of depression when compared with no treatment or control intervention, but when compared to psychological or pharmacological therapies, exercise appears to be no more effective (Cooney et al., 2013). Relaxation techniques may help managing depressive symptoms; however, they are not as effective as psychological treatment (Jorm et al., 2008).

In subjects with family-related stressors, family members or other close intimates were included in the process. Spouses were asked to participate in family therapeutic sessions when needed. During the course of the rehabilitation process one day was reserved for family counselling with family members or spouses. In a systematic review, Barbato and D'Avanzo (2006) found no evidence to suggest that marital therapy is more or less effective than individual psychotherapy or drug therapy in the treatment of depression. According to Henken et al. (2007) there is no sufficient evidence base to draw conclusions on the overall effectiveness of family therapy in the treatment of depression, and therefore, the use of psychological interventions for the treatment of depression, for which there already is an evidence-base recommendation, would seem to be preferable to family therapy.

Comparison of differences in managing depression by the (EERIP) and by the Finnish Guidelines (Isometsä et al., 2014) to treatment as usual is described in Table 2.

Table 2. Comparison of recommendations in the Early Eclectic Rehabilitative Intervention Programme (EERIP) and in the Finnish Guidelines\*

	Intervention group (EERIP)	Control group *
Antidepressive medication	Yes	Yes
Cognitive or other individual therapy	Yes	Yes
Work orientation	Yes	Yes/No
Family orientation	Yes	Yes/No
Group therapy methods	Yes	No
Duration of intensive interventions	6 months	No recommendation

\* Finnish Guidelines for managing depression (Isometsä et al., 2014)

## 4.6 One-year follow-up

After a one-year follow-up, beginning from the diagnostic interview at the baseline, the subjects received the follow-up questionnaires by mail. Of the 355 subjects, 283 met the inclusion criterion (Figure 1). The main questionnaires used in this study were BDI, TAS-20 and SOC 13.

## 4.7 Statistical methods

In study I for the comparison of categorical values, Chi-square and Fischer's exact tests were used, when appropriate, in the bivariate comparisons and Student's t-test for continuous variables.

In study II, when appropriate, Chi-square and Fischer's exact tests were used for bivariate comparison of categorical variables and Student's t-test was used for continuous variables.

A logistic regression model was used to examine the likelihood for the failure to decrease by 9 points or more in the BDI score during the one-year follow-up time. The covariates used in a logistic regression model were those which showed a statistically significant bivariate association with the study group. All tests were two-tailed and a limit for statistical significance was set at  $p < 0.05$ .

The last-observation carried forward (LOCF) approach was used, assuming that the BDI scores of the dropouts remained the same at follow-up as they were at baseline. In these analyses, the number of subjects in the intervention group was 134 and in the control group 127.

In study III for the comparison of categorical values, Chi-square and Fischer's exact tests were used, when appropriate, in bivariate comparisons and Student's t-test for continuous variables. Linear regression models adjusted for sex, social group and BDI score at the baseline were used for multivariate analyses.

In the fourth study (Study IV) the mean SOC score from the first and second data collection were compared using a paired samples t-test. The differences in the mean SOC scores between groups were tested using an independent samples t-test, and the differences between the sociodemographic characteristics between groups were tested with Pearson's Chi-square test. Using data collected at the follow-up, the effects of the BDI, occupational stressors, life situation stressors and group status on the changes in the SOC score between the two data collections were investigated using linear regression models with the SOC follow-up total score as a dependent variable and adjusting for the baseline SOC score. The sum of the BDI, occupational stressors, life situation stressors and group status were included as predictors, both independently as well as in combination. The models were tested both unadjusted and adjusted for gender, basic education, vocational education and social class. A p-value of  $< 0.05$  was considered statistically significant.

## 4.8 Attrition analysis

In the second study, an attrition analysis was conducted, comparing subjects who were included at the baseline, but who did not participate at the follow-up phase ( $n=41$ ) to those who did participate at the one year follow-up phase ( $n=234$ ). Most of the dropouts (82.9%) were from the control group ( $p < 0.001$ ). The drop outs did not, however, differ from the participants in terms of age, gender, OCPD or the severity of depression measured by BDI or SCID I at the baseline. In the third study according to the attrition analysis conducted, the dropouts did not differ from the participants in terms of age, gender, the severity of depression measured by BDI, or SCID I, or alexithymia at the baseline. Most of the dropouts (82.9%) were from the control group ( $p < 0.001$ ), of whom 11 (26.8%) were males, eight with alexithymia (72.7%), and 30 females (73.2%), three with alexithymia ( $p < 0.001$ ).

Analyses were done using SPSS Statistics Version 18 (Studies I–III) and 22.0 Study IV).

## 5 RESULTS

### 5.1 Characteristics of the sample at baseline and at follow-up

The sociodemographic characteristics of the sample at the baseline are shown in Table 3. Over two-thirds of the participants were married or cohabiting. Most of them were living in small counties. Four-fifths had basic education at more than the obligatory low level. Over fifty percent of the participants had vocational education at more than low level. About half of the subjects worked in the public and half in the private sector. Two-thirds of the participants belonged to the middle social class. There were no gender differences in the distribution of background factors except in employer status. Females worked more commonly in the public sector than males.

Table 3. Sociodemographic characteristics of the participants (Baseline sample)

Variable	Male		Female		All		Difference
	N	%	N	%	N	%	p-value
<b>Marital status</b>							0.670
Cohabiting	34	73.9	160	70.8	194	71.3	
Other	12	26.1	66	29.2	78	28.7	
<b>Population in the county</b>							0.075
< 7,000	17	37.0	54	23.9	71	26.1	
7,000–35,000	11	23.9	90	39.8	101	37.1	
> 35,000	18	39.1	82	36.3	100	36.8	
<b>Basic education</b>							0.351
High	13	28.3	89	39.4	102	37.5	
Medium	22	47.8	88	38.9	110	40.4	
Low	11	23.9	49	21.7	60	22.1	
<b>Vocational education</b>							0.165
High	8	17.4	46	20.4	54	19.9	
Medium	11	23.9	81	35.8	92	33.8	
Low	27	58.7	99	43.8	126	46.3	
<b>Status of employer</b>							0.001
Public	13	28.2	131	58.0	144	52.9	
Private	29	63.0	83	36.7	112	41.2	
Other	4	8.8	12	5.3	16	5.9	
<b>Social class</b>							0.102
High	12	26.1	31	13.7	43	15.8	
Medium	23	50.0	139	61.5	162	59.6	
Low	11	23.9	56	24.8	67	24.6	

The sociodemographic and clinical characteristics of the participants in the follow-up sample are shown in Table 4. The mean age was 44.6 years for males (standard deviation = SD 10.0) and 45.3 years for females (SD 8.1), ( $p=0.639$ ). Twenty-eight participants, 20.9% in the intervention group, and eight participants, 8.0% in the control group, were male. Of the participants, 169 (72.2%) were married or cohabiting and 112 (57.1%) were 40–50 years of age. One hundred and two participant, (77.8%) were educated beyond the compulsory level, 137 (52.6%) had vocational education higher than the lowest level. Of the participants 139 (59.4%) had middle social status. The proportion of subjects with high social status was greater in the intervention group compared to the control group. Of the participants, 131 (56.7%) worked in the public sector. Of all sociodemographic variables, statistically significant differences between the intervention and control groups were found in gender ( $p=0.007$ ) and social class ( $p=0.030$ ). In the clinical variables, less than every third person used antidepressive medication at the start of follow-up. The prevalence of OCPD was almost two-fold in the intervention group compared to the control group, and this difference between the study groups was statistically significant ( $p=0.028$ ).

TABLE 4. Sociodemographic and clinical characteristics of the participants. (Follow up sample)

Variable	Intervention group N=134		Control group N=100		Difference p-value
	N	%	N	%	
<b>Gender</b>					0.007
Male	28	20.9	8	8.0	
Female	106	79.1	92	92.0	
<b>Marital status</b>					0.819
Cohabiting	96	71.6	73	73.0	
Other	38	28.4	27	27.0	
<b>Age groups</b>					0.781
< 40 years	33	24.6	21	21.0	
40–50 years	62	46.3	50	50.0	
> 50 years	39	29.1	29	29.0	
<b>Basic education</b>					0.893
High	53	39.5	37	37.0	
Medium	51	38.1	41	41.0	
Low	30	22.4	22	22.0	
<b>Vocational education</b>					0.059
High	30	22.4	20	20.0	
Medium	57	42.5	30	30.0	
Low	47	35.1	50	50.0	
<b>Status of employer<sup>1,2</sup></b>					0.635
Public	74	56.1	57	57.5	
Private	52	39.4	35	39.4	
Other	6	4.5	7	7.1	
<b>Social status</b>					0.030
High	24	17.9	10	10.0	
Medium	83	61.9	56	56.0	
Low	27	20.2	34	34.0	
<b>Antidepressive medication<sup>2</sup></b>					0.885
Yes	38	28.4	29	29.3	
No	96	71.6	70	70.7	
<b>OCPD<sup>3</sup></b>					0.028
Yes	41	30.6	18	18.0	
No	93	69.4	82	82.0	

<sup>1</sup> two missing cases in the intervention group, one missing case in the control group

<sup>2</sup> one missing case in the control group

<sup>3</sup> OCPD = Obsessive-Compulsive Personality Disorder

## 5.2 The occurrence of obsessive-compulsive personality disorder in people with depression among occupational health care clients? (Study I)

Of the participants% (109) had at least one PD, 32.0% had OCPD, 5.5% had avoidant PD and 2.6% had other PDs. The prevalence of any PD was 56.5% among males and 36.7% ( $p=0.013$ ) among females and the prevalence of OCPD was 50.0% and 28.3% ( $p=0.004$ ), respectively. The participants with and without OCPD did not differ in terms of age distribution, marital status, basic and vocational education (Table 5). Similarly, there was no difference between the participants with OCPD or without OCPD in terms of SOFAS, or in levels of depression according to the BDI score. The only difference found was in social class. Among subjects with OCPD, the proportion of those belonging to the highest social group was twice as high as in subjects without OCPD ( $p=0.026$ ).

Table 5. Sociodemographic factors of participants with and without obsessive compulsive personality disorder (OCPD)

Variable	No OCPD		OCPD		Difference
	N	%	N	%	p-value
<b>Gender</b>					0.004
Male	23	26.4	23	12.4	
Female	162	73.6	64	87.6	
<b>Marital status</b>					0.575
Cohabiting	130	48.7	64	52.8	
Other	55	51.3	23	47.2	
<b>Basic education</b>					0.684
High	68	36.8	34	39.1	
Medium	78	42.2	32	36.8	
Low	39	21.0	21	24.1	
<b>Vocational education</b>					0.164
High	37	20.0	17	19.5	
Medium	56	30.3	36	41.4	
Low	92	49.7	34	39.1	
<b>Social class</b>					0.026
High	23	12.4	20	23.0	
Medium	110	59.5	52	59.8	
Low	52	28.1	15	17.2	

### 5.3 How does an early rehabilitation programme affect depression? (Study II)

According to the SCID I interviews, 34.3% of the participants in the intervention group had mild, 59.0% moderate and 6.7% severe major depression at baseline. In the control group the respective rates were 49.0%, 45.0% and 6.0% ( $p=0.075$ ). The mean BDI score at the beginning of the study was 20.8 (SD 7.3) in the intervention group and 19.3 (SD 7.4), ( $p=0.136$ ) in the control group, and after one year of follow up, 9.1 (SD 9.1) and 8.8 (SD 8.1), ( $p=0.858$ ) respectively. The mean decrease in BDI scores in the intervention group was 11.6 (SD 10.0) and 10.8 (SD 9.8) in the control group. The decrease was statistically significant within both groups ( $p<0.001$ ).

In all four outcome measures described in the methods analysis section, the only significant difference between the study groups was found in the decrease in BDI scores over 9 points during the one-year follow-up period. This was the case in two-thirds of the intervention group and in half of the control group ( $p=0.013$ ; Table 6). When this association was modelled with a logistic regression analysis (Table 7), after controlling for participants' gender, OCPD and social class, the result remained statistically significant. When compared to the intervention group, the likelihood of control group members not having a decrease of 9 points or more in BDI score during the follow-up was 1.89 (CI 1.06–3.37,  $p=0.030$ ).

In the Last observation carried forward (LOCF) analyses, three of the four outcome measures were significant. BDI scores decreased over 50% in 60.6% in the intervention group and 42.7% ( $p=0.004$ ) in the control group. BDI decreased over nine points in 60.6% in the intervention group and 39.5% ( $p<0.001$ ) in the control group. Mean decrease of the BDI scores was 10.9 (SD 10.0) in the intervention group and 8.0 (SD 9.7;  $p=0.016$ ) in the control group.

TABLE 6. The Beck Depression Inventory (BDI) scores and changes in BDI scores during the follow-up period, measured in four different ways in the intervention and control groups

BDI score changes	Intervention group (n=134)		Control group (n=100)		Difference $\chi^2$ -test, p-value		
	N	%	N	%			
<b>&lt; 10 at the end of the follow-up<sup>1</sup></b>					0.907		
No	51	38.6	39	39.4			
Yes	81	61.4	60	60.6			
<b>decreased <math>\geq</math> 50% during the follow-up<sup>2</sup></b>					0.329		
No	46	35.7	39	42.4			
Yes	83	64.3	53	57.6			
<b>decreased &gt; 9 points during the study<sup>2</sup></b>					0.013		
No	46	35.7	17	46.7			
Yes	83	64.3	49	53.3			
<b>Mean changes in the BDI scores<sup>2</sup></b>	Intervention group (n=134)			Control group (n=100)			T-test, p-value
	N	Mean	SD <sup>3</sup>	N	Mean	SD <sup>3</sup>	
	129	-11.6	10.0	92	-10.8	9.8	0.525

Note: The number of cases varies due to missing information in variables:

<sup>1</sup> three missing cases

<sup>2</sup> thirteen missing cases

<sup>3</sup> SD = Standard deviation

TABLE 7. The effect of the intervention on changes in the BDI scores, using the logistic regression model

Variable	Failure to have decrease in BDI scores > 9 (% <sup>1</sup> )	OR <sup>2</sup>	95 % CI <sup>3</sup>	p-value
<b>Group</b>				
Control	46.7	1.89	1.06–3.37	0.030
Intervention (ref)	35.7			
<b>Gender</b>				
Male	50.0	1.79	0.85–3.77	0.104
Female (ref)	38.4			
<b>OCPD</b>				
Yes	47.4	1.49	0.79–2.81	0.172
No (ref)	37.8			
<b>Social status</b>				
Low	36.2	0.74	0.39–1.42	0.368
High+moderate (ref)	41.7			

Note: 13 cases missing

<sup>1</sup> Failure = BDI score did not decrease 10 points or more. The control group was compared with the intervention group taking into account gender, obsessive compulsive personality disorder (OCPD) and social group.

<sup>2</sup> OR = Odds Ratio

<sup>3</sup> CI = Confidence Interval

## 5.4 How does an early rehabilitation programme affect alexithymia in depressive health care clients? (Study III)

The prevalence of alexithymia at the baseline was 20.1% in the intervention group and 16.0% ( $p=0.418$ ) in the control group. Corresponding figures at the follow-up were 18.9% and 7.1% ( $p=0.010$ ). The decrease in the prevalence of alexithymia was statistically significant in the control group ( $p=0.012$ ), but not in the intervention group ( $p=0.848$ ). The prevalence of alexithymia was significantly lower at the follow-up in the control group than in the intervention group ( $p=0.010$ ), (Table 8). The mean scores of alexithymia decreased in both groups (Table 8).

Table 8. The prevalence and mean scores of alexithymia at the baseline and at the follow-up of the study and the changes in alexithymia scores during the follow-up time in the intervention and control groups.

Variable	Intervention group		Control group		Difference
	N	%	N	%	$\chi^2$ -test, p-value
<b>Alexithymia at the baseline</b>					
No	107	79.9	84	84.0	0.418
Yes	27	20.1	16	16.0	
<b>Alexithymia at follow-up<sup>a,b</sup></b>					
No	107	81.1	92	92.9	0.010
Yes <sup>b</sup>	25	18.9	7	7.1	
	N	Mean (SD)	N	Mean (SD)	T-test, p-value
<b>TAS scores at the baseline</b>					
Total score <sup>b</sup>	132	50.4 (12.1)	100	48.7 (11.6)	0.305
DIF subscale score <sup>b</sup>	132	17.4 (5.5)	100	17.1 (6.1)	0.650
DDF subscale score <sup>b</sup>	132	13.1 (4.6)	100	13.1 (4.1)	0.279
EOT subscale score <sup>b</sup>	132	19.9 (4.8)	100	19.3 (4.7)	0.305
<b>at the follow-up</b>					
Total score <sup>a,b</sup>	132	46.9 (13.5)	99	44.0 (11.6)	0.087
DIF subscale score <sup>a,b</sup>	132	15.3 (6.7)	99	13.9 (5.8)	0.097
DDF subscale score <sup>a,b</sup>	132	12.5 (4.6)	99	11.4 (4.1)	0.081
EOT subscale score <sup>a,b</sup>	132	19.4 (4.6)	99	18.7 (4.9)	0.448

<sup>a</sup> one missing case in the control group

<sup>b</sup> two missing cases in the intervention group

DIF=difficulty in identifying feelings

DDF=difficulty in describing feelings

EOT=externally-oriented thinking

## 5.5 How does an early rehabilitation programme affect the sense of coherence in depressive health care clients? (Study IV)

The increase in the mean SOC score was statistically significant both in the rehabilitation group (54.91 compared to 62.85,  $p < 0.001$ ) and in the control group (55.29 compared to 61.64,  $p < 0.001$ ). The two groups' mean SOC scores (54.91 compared to 55.29,  $p = 0.82$ ) did not differ statistically at the baseline or at the 1-year follow-up (62.85 compared to 61.64,  $p = 0.51$ ). An over 10% change in the SOC score was found in 53.1% of the participants in the rehabilitation group and in 48.4% of the participants in the control group. A decrease  $\geq 10\%$  in the SOC score was found in 17.7% of the participants in the rehabilitation group and in 9.5% ( $p = 0.081$ ) of the participants in the control group.

At the baseline, the main occupational stressors in both groups were the same three: mentally stressful work (76.1% in rehabilitation group and 69% in control group), excessive workload (67.9% and 62%) and management problems/lack of support (53% and 55%). At the 1-year follow-up, the three main occupational stressors remained the same. The three most common life situation stressors at the baseline were other stressor in my life at present (40.3% in rehabilitation group and 42.0% in control group), illness of a person close to me (35.8% and 36.0%) and relationship problems with spouse (33.6% and 34.0%). At the follow-up, common life situation stressors remained the same.

No significant association was found between the group status and the change of the SOC score ( $p = 0.452$ ; Table 9). At the follow-up, the change in the BDI, occupational stressors and life situation stressors were related to the change in the SOC ( $p < .001$ ) in both the rehabilitation and control groups.

However, rehabilitation had a modifying effect on the change in the SOC when interaction between the BDI at the follow-up and the group status was studied ( $P = 0.003$ ). This finding indicates that those in the rehabilitation group with a lower BDI at the 1-year follow-up had a stronger SOC than those in the control group. The same modifying effect was found when investigating the interaction between the change in the BDI and group status ( $P = 0.041$ ), showing that the greater the decrease in the BDI, the stronger the SOC at the 1-year follow-up.

Table 9. Effects of group status, BDI, occupational and life situation stressors on the change in the SOC

	Unadjusted			Adjusted <sup>a</sup>		
	B	S.E.	p	B	S.E.	p
IG <sup>c</sup>	1.42	1.58	0.368	1.25	1.66	0.452
IG <sup>c</sup> , adjusted for BDI	1.50	1.14	0.187	1.37	1.20	0.254
BDI at follow-up	-0.97	0.07	<0.001	-0.97	0.07	<0.001
Change in BDI	-0.72	0.07	<0.001	-0.73	0.07	<0.001
Occupational stressors at follow-up	-1.05	0.28	<0.001	-1.09	0.29	<0.001
Life situation stressors at follow-up	-2.22	0.48	<0.001	-2.37	0.51	<0.001
<b>Interactions<sup>b</sup></b>						
IG <sup>c</sup> -BDI	-0.38	0.13	0.003	-0.39	0.13	0.003
IG <sup>c</sup> -change in BDI	-0.29	0.14	0.035	-0.29	0.14	0.041
IG <sup>c</sup> -occupational stressors	0.02	0.56	0.972	0.02	0.56	0.978
IG <sup>c</sup> -life situation stressors	-1.18	0.98	0.232	-1.20	0.99	0.229

a Model adjusted for gender, basic and vocational education, and social class.

b Difference in the slope for the corresponding variable in the rehabilitation group when compared to the control group.

c IG=Intervention group.

d S.E.=Standard error

## 6 DISCUSSION

### 6.1 Representativeness of the sample

The subjects were from 18 occupational health care units in Northern Finland who were willing to participate in this project. There were no exclusion criteria for occupational health care centers, so all centres willing to participate were included. The basic population represents occupational health care patients in Northern Finland. There is no other study in the literature with a similar setting.

The subjects came from occupational health care units after they had been screened for depression by using the BDI self-reporting scale. The subjects represented a group of first episode of depression among employees. They had not previously had notable treatment for depression. The group was suffering from depression without other serious mental disorders, alcoholism or psychotic disorders. The participants did not represent employees with psychiatric disorders in general, but employees with first episode depression.

### 6.2 Assessments

The subjects were interviewed with Structured Clinical Interviews for DSM-IV (SCID I-II), (First et al., 1997a; First et al., 1997b) as a diagnostic method. The SCID interviews were conducted by trained and experienced interviewers. SCID is widely used as a diagnostic instrument (American Psychiatric Association, 2000). All cases were reviewed together with a senior researcher, who has long experience of using the SCID. The Social and Occupational Assessment Scale (SOFAS) (American Psychiatric Association, 1994) was used to measure social and occupational functioning during the diagnostic SCID interview. The SOFAS is used to rate functioning for the current period and it is recommended for use in subjects with mood disorders (Isometsä et al., 2014). The Finnish version of the Beck depression inventory is a widely used method in the assessment of depression (Heistaro, 2005; Viinamäki et al., 2004; Nuevo et al., 2009). BDI has been mentioned as screening method for depression in many guidelines (ICSI, 2009; NICE, 2009; Isometsä et al., 2014). The diagnosis of depression was made by using the SCID I interview. Of the different methods for measuring alexithymia, the 20-item version of the Toronto Alexithymia Scale (TAS-20) is the most widely used and presumably the most carefully validated one. Its internal

consistency, test-retest reliability, convergent, discriminant, and concurrent validity have been demonstrated to be good (Bagby et al., 1994a; Bagby et al., 1994b; Parker et al., 2003; Taylor et al., 2003). The psychometric properties of the Finnish version of the TAS-20 have been shown to be satisfactory (Joukamaa et al., 2001).

The sense of coherence (SOC) of the participants was measured using the SOC-13 questionnaire. It is based on the original 29-item scale (Antonovsky, 1993). The SOC scale seems to be a reliable, valid, and cross-culturally applicable instrument measuring how people manage stressful situations and stay well (Flannery et al., 1994; Eriksson and Lindström, 2005; Flensbor-Madsen et al., 2005; Feldt et al., 2007).

## 6.3 Specific discussion of studies I–IV

### 6.3.1 The occurrence of obsessive-compulsive personality disorder in people with depression among occupational health care clients (Study I)

A third of the participants suffering from first ever depressive episode had a comorbid obsessive compulsive personality disorder (OCPD). This finding is in line with the hypothesis that PDs, especially OCPD, would be common in first episode depression.

The prevalence of OCPD has been about 10% among depressive psychiatric patients (Zimmerman et al., 2005). In this study the prevalence was higher. This difference may be due to patient sample: the work environment may suit or even require personality traits typical of OCPD. Obsessive-Compulsive personality traits may be advantageous, especially in situations that reward high performance. In this study the gender difference in the prevalence of OPCD was clear; there were more males with OCPD than females. In a large earlier population study in the USA with 43,000 adults, the lifetime prevalence of OCPD was 7.8%, with the same rates for males and females (Grant et al., 2012). According to a Norwegian population study with more than 2,000 individuals, the prevalence of OCPD was twice as common in males as in females (Torgersen et al., 2001). The gender difference noted in our study is in line with the Norwegian study. There exist no other studies among occupational health care concerning personality disorders.

It can be assumed that subjects with OCPD will have a tendency to overload their work tasks. They emphasize order, perfection and the controlling of experiences and interactions at the expense of flexibility, transparency and greater efficiency (American Psychiatric Association, 2006). On the other hand, an equivalent mechanism among subjects with avoidant personality disorder can also result in depression: these people are characterized by a pervasive pattern of social inhibition, feelings of inadequacy, extreme sensitivity to negative evaluation, and avoidance of social interaction (American Psychiatric Association, 2006). It has been suggested that, in OCPD patients, the impairment in general functioning, and particularly in social functioning, would be stable (Skodol et al., 2005a). In OCPD, perfectionism can manifest in different ways. Perfectionist people usually set

realistic standards for themselves, derive pleasure from their painstaking labours, and are capable of choosing to be less precise in certain situations. On the other hand, perfectionists who are too neurotic demand of themselves a usually unattainable level of performance, view their efforts as unsatisfactory, and are unable to relax their standards (Hamachek, 1978). An association between MDD and PDs has previously been identified. PDs usually lead to MDD, but in some cases, depression may influence personality pathology, and may even lead to PDs (Farabaugh et al., 2004). MDD may maintain PD diagnosis like OCPD, compared with patients initially diagnosed with MDD alone (Farabaugh et al., 2005). Specific PD comorbidity might affect the course of MDD by modulating factors that increase the overall risk of depression (Candrian et al., 2008). PDs predict relapse after remission from an episode of MDD (Grilo et al., 2010). It can be proposed, with caution, that OCPD may lead to MDD.

One interesting finding in this study was that depressive patients with and without OCPD did not differ from each other in terms of many background factors (age, education, marital status) or in the severity of depression and functional status. In earlier studies, PDs have been shown to associate with low education, living alone, low income, and especially with living in urban areas (Coid et al., 2006; Grant et al., 2012). One reason for this difference may be the fact that our sample only included employed people. The prevalence of OCPD in this study was more common in the highest social group than in the lower social groups; however, there were no differences in the basic education. In the US population study mentioned previously, OCPD was significantly more common in individuals with a low educational level (Grant et al., 2012). In the Norwegian population study, OCPD was more common in subjects with higher levels of education (i.e., college/university education) compared with those with less education (Torgesen et al., 2001). Contrary to this study, the Norwegian population study (Torgersen et al., 2001) found a positive association with OCPD and education.

Concerning work life and depression, there may be some important aspects: OCPD may cause difficulty moving forward in career situations, and the social isolation and difficulty handling anger that are common with OCPD may lead to depression and anxiety later in life. The core traits of OCPD may lead to deficits in interpersonal functioning, relationships and expectations (Cain et al., 2015). Interpersonal skills are important in work life; there seems to be an association between OCPD and obsessive compulsive disorder, too (Eisen et al., 2006; Gordon et al., 2013, Starcevic and Brakoulias, 2014).

### 6.3.2 The effect of the rehabilitation programme on depression (Study II)

The hypothesis that in first ever episode of depression among working-age employed people, the EERIP may be more effective in reducing symptoms of depression than treatment as usual (TAU) received only some support. Earlier studies have shown positive influence of the interventions in managing depression (Sullivan et al., 2006; Wang et al., 2007;

Lexis et al., 2011; Lind et al., 2011; Furlan et al., 2012; Saltychev, 2012; Stenlund et al., 2012; Vuori et al., 2012), but Saltychev (2012) did not find evidence of the effectiveness of rehabilitation amongst public sector employees. Considering rehabilitation as one part of the process when managing depression in employed people, early intervention may provide an additional useful option for this purpose.

The EERIP included collaborative work with the participants' employers. The aim was to identify possible recommendations for changes in working conditions and work environment in order to reduce work-related stress. The active collaborative work conducted during the intervention process may explain why the participants in the intervention group benefited from the EERIP. Andrea et al. (2009) have encouraged the use of intervention studies to test whether changes in the workplace or in the psychosocial work environment reduce depressive symptoms among employees. Dietrich et al. (2012) have suggested that more tailored interventions, targeting depression directly, are needed in the workplace. There is a need for new strategies in clinical practice with regard to the psychosocial work environment and disability due to mental disorders (Joensuu et al., 2010; Cornelius et al., 2011). This may be a step before vocational rehabilitation, a process which enables persons with functional, psychological, developmental, cognitive and emotional impairments or health conditions to overcome barriers to accessing, maintaining or returning to employment or other useful occupation.

The EERIP provided an opportunity for the subjects to obtain peer support, to reduce the stigma associated with mental health and to better understand the features of depression. Stigma can lead to discrimination, which may be obvious and direct, such as someone making a negative remark about the mental illness or treatment, or other workers and lay people showing ignorance with regard to the causes and treatment of mental disorders (Furnham, 2009). Peer support occurs when people provide knowledge, experience, and emotional, social or practical help to each other (Mead and MacNeil, 2006). Peer support interventions have been shown to be superior to usual care in reducing symptoms of depression (Pfeiffer et al., 2011). In the present rehabilitative intervention, peer and social support were emphasized, with focus on the role of social support via collaborative action with employers and family members. This may partly explain the better results in the EERIP group. Despite the fact that there were no measuring instruments or questionnaires for it in this study, it can be assumed that peer support and social support in the interventions have the potential to be effective components of depression care, supporting the inclusion of peer support in recovery-oriented mental health treatment.

The proportion of OCPD in this study was higher in the EERIP group than in the control group. In the EERIP group, there were more subjects belonging to the highest social group than the lower social groups. OCPD probably impairs recovery from depression (Thota et al., 2012). However, there was no difference in the recovery concerning depressive symptoms between subjects with and without OCPD, or belonging to low or high/middle

social class. The rehabilitation intervention did not thus have any special effect in terms of depression in subjects with OCPD. There are no comparable studies.

There are two remarkable aspects as to why the difference between the intervention and control group measured with BDI was rather minimal. The first may be that all the subjects got a psychiatric intervention in the form of SCID I-II interview lasting 2–3 hours, and the second, that all the subjects got the treatment as usual for depression in the occupational health care units. There was no difference between the groups concerning the use of antidepressants.

### 6.3.3 The effect of the rehabilitation programme on alexithymia (Study III)

The main finding of this study was that the rehabilitation programme EERIP among employed people with first ever diagnosed episode of depression did not have a decreasing effect on alexithymia in the intervention group as hypothesized. Instead, alexithymia was less common in the control group after one year of follow-up. The finding was opposite to the hypothesis. To the best of the author's knowledge, no earlier similar studies exist exploring the effectiveness of an eclectic rehabilitative intervention on alexithymia in working-age persons experiencing first-episode depression.

The subjects came from occupational health care units. Alexithymia is quite common among working-age people. The prevalence has been shown to be about 9%–17% for men and 5%–10% for women (Salminen et al., 1999; Kokkonen et al., 2001; Mattila et al., 2006). The prevalence of alexithymia in the subjects in this study was in line with these figures. This is surprising because all the subjects were diagnosed with depression and the prevalence of alexithymia among depressive people has been shown to be much higher than among general population (Honkalampi et al., 2000; Saarijärvi et al., 2001). The reason may be that all the participants in this study were employed. Recovery from depression has been shown to be associated with a decrease in alexithymic features (Taylor et al., 1997; Honkalampi et al., 2000).

In the present study, the BDI scores decreased in both the intervention and control groups, while the TAS-20 total and the subscale scores did not change significantly. However, recovery from depression assessed with the change in BDI scores associated with change in total alexithymia scores in both groups. Hence, recovery from depression was associated with a decrease in alexithymic features. The prevalence of alexithymia decreased more in the control group. An interesting question is why the subjects in the intervention group did not benefit from the intervention in terms of alexithymia in spite of the evidence showing that interventions have an influence on it. In the EERIP the group working methods were based on eclectic practice including both cognitive behavioural and psychodynamic principles. The EERIP gave a possibility for the subjects to obtain peer support and an opportunity to reduce individual stigma as well to better understand the features of depression and increase the insight of illness (Kauhanen et al., 2002). From this

point of view, the EERIP should have been a tool in alleviating alexithymia as well, but this was not shown by the results. According to the hypothesis, the amount of alexithymia was expected to decrease when the depression was alleviated. In this study, the subjects in the intervention group did not benefit from these methods in terms of alexithymia. This may be due to the relatively short intervention or the group-type method being too demanding for the subjects with alexithymia. Of the subjects only 8% were males in the control group and 21% in the EERIP group, which may limit the generalizability of the results to both sexes. Moreover, a high number of the dropouts in the control group were males. Nevertheless, there were no differences in the outcome measures between males and females. Most of the dropouts were from the control group. In the EERIP group, there were more subjects belonging to the highest social group than to the lower social groups. Alexithymia has been shown to associate with low socioeconomic status (Salminen et al., 1999, Kokkonen et al., 2001; Mattila et al., 2006). A follow-up period of one year may be too short to evaluate the long-term effect of the rehabilitative intervention, especially in the case of a relatively stable trait like alexithymia, and to implement cognitive tools and to establish new behaviours (Stenlund et al., 2012). Spek et al. (2008) found in a one-year follow-up study concerning cognitive behaviour therapy outcome for sub-threshold depression that changes in depressive symptoms correlated significantly with changes in alexithymia while baseline alexithymia scores did not correlate with treatment outcome. The EERIP took 6 months and included 31 active days and the primary focus was on the rehabilitation of depression, not alexithymia. According to Cameron et al. (2014), studies that directly target alexithymic symptoms tend to report significant reductions in alexithymia scores following treatment, whereas studies that measure changes in alexithymia but do not employ any psychological interventions specifically intended to treat alexithymia show more inconsistent results.

Even if the EERIP may represent a useful addition in the management of the complex and multifactorial syndrome of depression, the intervention programme had no decreasing effect on the amount of alexithymia after one year of follow-up in the intervention group in subjects with first episode of depression. Indeed, alexithymia was alleviated in subjects in the control group with conventional treatment. The results can not be explained by the fact that the participants in both the rehabilitation and control groups received treatment sufficient for their psychological adjustment in terms of treating depression.

#### 6.3.4 The effect of the rehabilitation programme on sense of coherence (Study IV)

In this study an increase in the SOC mean score was observed both in the rehabilitation group and the control group with no difference between the groups. The results indicate that the SOC is changeable during an intervention aiming at relieving symptoms of depression. SOC has been found to associate with depression and seems to be a predictor of depressiveness amongst age, gender, education, marital and employment status (Weissbecker

et al., 2002; Cohen and Savaya, 2003; Zboralski et al., 2006; Klepp et al., 2007; Välimäki et al., 2009; Berg, 2010; Erim et al., 2011, Pillay et al., 2014; Mattisson et al., 2014). Carstens and Spangenberg (1997) found a significant negative correlation between scores on BDI and total scores on the SOC scale. Suffering from clinical depression, the participants were expected to have a low SOC (Eriksson and Lindström, 2006). The groups in this study fall in the middle. The SOC of subjects with depression attending a rehabilitation programme was not enhanced more than the SOC of the control group at the 1-year follow-up. A probable explanation for the non-significant results between the groups may lie in the fact that the participants in both the rehabilitation and control groups received treatment sufficient for their psychological adjustment. Specific information about the treatment received in the control group was not available; did the treatment of depression in the occupational health care units follow the Finnish guideline of depression treatment? (Isometsä et al., 2014). The finding in the second part work of this study shows that the difference in the mean BDI score at the baseline between the groups was not statistically significant. The occupational health care units involved in the study were informed about the rehabilitative intervention programme. This may indicate that the treatment of first episode of depression was given particular attention in the occupational health care units, especially in those who were screened but not selected for the rehabilitation programme.

The salutogenic model states that coping resources are defined within sociocultural and historical contexts and that various social and historical factors influence the availability of such resources (Tsuno and Yamaki, 2012). Exploring whether the severity of depression and the presence of current occupational and life situation stressors were associated with the change in the SOC revealed some differences between the study groups. The lower the BDI or the greater the changes in the BDI score, the more the SOC had increased. The study suggests that rehabilitation may help in enhancing the SOC more effectively among those with less severe depression or those whose BDI score decreased further during the one-year follow-up.

A possible explanation for these outcomes could be in the slight differences in the severity of depression between the groups at the baseline. In the intervention group 29.8% had mild depression, while in the control group 44.1% belonged to this category. The proportion of the subjects who had moderate or severe depression was higher in the intervention group than in the control group. According to the results of the second part work of the study, the BDI score decreased by 10 or more points in 71% of the rehabilitation group and 52% of the control group subjects, a difference that is statistically significant. These findings support the idea that although an association exists between depression and SOC, the latter is not explained by depressive symptoms (Weissbecker et al., 2002; Cohen and Savaya, 2003). Occupational stressors were associated with the change in the SOC in both groups. The strengthened SOC may be a modifier of occupational stress exposure, but this was not directly examined in the study. In previous studies a strong SOC has been found to serve as a buffer from stress almost independently of industrial managers' perceived stressors

(Kivimäki et al., 1998). Furthermore, the SOC may be an important factor determining the coping ability for job stress (Urakawa and Yokohama, 2009). Along with occupational stressors, life situation stressors, too, were related to the change in the SOC in both study groups. A significant negative correlation between negative life events and the SOC has been noticed in earlier studies as well (Jorgensen et al., 1999; Lövheim et al., 2013).

## 6.4 Study strengths

From the methodological point of view there are strengths in this study. A control group was used in a randomized design with a follow-up time of one year. To the author's knowledge, no earlier similar studies exist exploring PDs in working-age people suffering from first-episode depression, using appropriate methods for psychiatric case identification. Comparative studies of this kind focusing on this type of rehabilitative intervention among employed people have not been conducted previously measuring the effect on depression, alexithymia and sense of coherence. The diagnoses were made by using appropriate interview techniques. Additionally, the longitudinal study design allows the observation of a one-year change in the outcome measures used. The holistic approach consisting of occupational health care, rehabilitation and psychiatry provides an interdisciplinary and multidimensional focus for the study.

## 6.5 Study limitations

This study has several limitations. Most of the subjects were female, and the small proportion of male subjects diminished the statistical power and may limit the ability to generalize the results to males. The small number of males is probably due to the characteristics of the population from which the sample was drawn. In many of the occupational health care units involved in the study, most clients were working in social and health care and education professions, in which the majority of employees tend to be females. Moreover, a high number of the dropouts in the control group were male. One limitation may be that most of the dropouts were from the control group. It may be that the intervention motivated more subjects to participate than TAU.

It should be noted that results concerning personality disorders rest on the cross sectional basic assessments completed in this project, which is why no causal conclusions can be drawn. The personality disorder diagnoses were categorical. We did not measure the dimensionality of the PDs. On the other hand, in this respect the new DSM-5 classification does not differ from the DSM-IV classification used in this study. According to Melartin et al. (2010), among MDD patients, the categorical stability of concurrent personality disorder diagnoses assigned while depressed is relatively poor, but the dimensional stability is moderate and also the remission of depression as well as comorbid anxiety disorders,

influences personality disorder diagnoses. Diagnosing personality disorders during depressive episode is not unambiguous. The presence of personality disorders hinders alleviation of depressive symptoms in major depression (Viinamäki et al., 2002). It is difficult to diagnose personality disorders during a depressive episode because depression can include symptoms strongly suggestive of personality disorder (Viinamäki et al., 2006). However, Michels (2010) notes that the assessment of personality is an important part of the assessment of any depressed patient and it can be conducted during an episode of depression. Skodol et al. (2011) have proposed that personality psychopathology should be assessed in all patients with MDD. Indeed, consideration of personality features is crucial to the understanding and management of major depression (Bagby et al., 2008), and OCPD may have associations even with other mental disorders, for example obsessive compulsive disorder (Diaferia et al., 1997; Gordon et al., 2013; Starcevic and Brakoulias, 2014), and anxiety disorders (Albert et al., 2004; Fineberg et al., 2007). Koutoufa and Furnham (2014) have stressed the necessity of greater mental health awareness and the importance of psychoeducation in order to increase successful treatment-seeking of OCPD patients.

A follow-up period of one year may be too short to evaluate the long-term effect of the rehabilitative intervention. More time would be needed to fully implement cognitive tools and to establish new behaviours (Stenlund et al., 2012). The EERIP took 6 months and included 31 active days. We had no detailed information of the resources and practices in the occupational health care units concerning the management of depression (i.e., treatment as usual), and we did not know to what extent the recommended guidelines for the treatment of depression were being followed (Isometsä et al., 2014).

The use of a self-report inquiry like BDI may not be as reliable as using rating scales or standardized psychiatric interview techniques in evaluating the severity of depression (Snaith, 1993; Möller, 2009). However, the BDI is widely used in depression treatment studies (Beck et al., 1988; Lasa et al., 2000; Viinamäki et al., 2004; Nuevo et al., 2009). The correlation between BDI scores and other depression rating scales and psychiatric interview is strong (Viinamäki et al., 2004; Furlanetto et al., 2005). Veerman et al. (2009) have found that mean BDI scores correlate well with the prevalence of depression determined by clinical interviews. Uher et al. (2008) examined and integrated the psychometric properties of three commonly used rating scales: the 17-item Hamilton Depression Rating Scale (HAM-D-17), the Montgomery-Asberg Depression Rating Scale (MADRS) and the Beck Depression Inventory (BDI), and found that the MADRS and the BDI can be recommended as complementary measures of depression severity.

## 7 CONCLUSIONS

### 7.1 Main findings

One third of the clients from the occupational health care units suffering from first ever depressive episode had a comorbid obsessive compulsive personality disorder (OCPD). The early eclectic rehabilitative intervention programme (EERIP) in first ever episode depression may be more effective in reducing symptoms of depression than treatment as usual (TAU) among working-age employed people. However, the effect on symptom level of depression was only minimal. An unexpected finding was that the rehabilitation programme EERIP did not have a decreasing effect on alexithymia in the intervention group as hypothesized. The SOC of subjects with depression attending the rehabilitation programme was not enhanced more than the SOC of the subjects in the control group.

### 7.2 Clinical conclusion

There are some clinical implications in this rehabilitative intervention study among depressed employees. The severity of major depression has been associated with increased disability and reduced work performance. A large proportion of the employees with depression also suffer from OCPD. OCPD may lead to depression and cause work disability or reduced work performance in middle age. It is important to recognize comorbid personality disorders when assessing working-age people suffering from depression.

The results show some potentially beneficial effect of the EERIP intervention. EERIP may represent a useful addition in the management of the complex and multifactorial syndrome of depression, improving occupational care units' ability to help and treat employees presenting with a first ever episode of depression. From the point of view of the work life, all the aspects described above have clinical significance, i.e., obsessive compulsive personality disorder, major depressive disorder, alexithymia and sense of coherence.

### 7.3 Future research

This study gave the possibility to assess the cooperation between health care, rehabilitation and psychiatry which may be an important aspect in the future. The future of the treatment of depression may lie in a combined disorder- and person-centred, tailored-made approach taking into account the broader interpersonal context and life history of the individual aiming to full remission (Spadone and Corruble, 2010; Luyten and Blatt, 2012; Jacobs, 2013). In the future, it may be important to discuss what are the appropriate measures to evaluate the effect of rehabilitation on depression as a multidimensional and diffuse syndrome. According to Griffiths (2009), rehabilitation services should ensure that they have rehabilitation goals that strengthen individuals' sense of coherence because of the hidden potential of the SOC concept, of course while bearing in mind the results of this study indicating only slight evidence for enhanced SOC. However, the SOC may represent a valuable tool in evaluating the outcome of interventions and quality of life (Eriksson and Lindström, 2007). From this point of view there is a need for longitudinal research to establish variability of SOC in a controlled intervention setting.

The effects of the EERIP intervention in terms of amount of sickness absence days caused by depression have not been studied yet. This is a remarkable aspect in work life as well as a social issue. The effectiveness of early rehabilitation of depressive disorders among employed persons is also an important target for further studies in terms of the cost effectiveness of rehabilitation. This is the question of how to allocate resources. The prevention of depression from becoming a chronic condition is one goal of the study, so a longer follow-up time than one year is needed to study that.

# ACKNOWLEDGEMENTS

This study was carried out at School of Health Sciences, University of Tampere, during the years 2004–2016, and at the Department of Psychiatry at the University of Oulu. I thank both of these institutions for the opportunity that made it possible for me to do that.

I am grateful to my supervisor Professor Matti Joukamaa from the School of Health Sciences at the University of Tampere and to my co-supervisor Professor Juha Veijola from the Department of Psychiatry at the University of Oulu for the privilege of scientific work. Their profound experience and knowledge have been invaluable during the whole process. I have received answers to my questions quickly and precisely. The discussions with them and their supervision during the process have supported me to reach the goal.

I am grateful to my co-authors Mia Valtonen, PhD, Sanna Blanco Sequeros, MD, Jorma Kiuttu, MD, PhD, Marja-Liisa Kauhanen, MD, PhD, Kristian Läksy, MD, PhD, Kirsi Vainiemi, MD, and Annamari Tuulio-Henriksson, PhD. I highly appreciate their thorough and intelligent reviews of the manuscripts. I am also grateful to Helinä Hakko, PhD, for introducing me to the world of statistics and for her advice and ultimate expertise in statistical analysis.

I express my appreciation to the reviewers of this work, Professor Jyrki Korkeila and Docent Hanna Valtonen, for their excellent and professional comments.

I also want to thank David Cowling and Anna Vuolteenaho for revising the language of my thesis.

I am grateful to the personnel of Oulu Deaconess Institute Ltd where the rehabilitation process was carried out. My thanks to Leena Männistö, Tuulikki Tuurinkoski, Aila Mikkonen and Jouko Luotola for the professional and long-term work during the rehabilitation process.

I wish to thank respectfully the many persons at the Social Insurance Institution of Finland in Oulu who started and dealt with pioneer work in the process on which this study focused; I want to mention Pirjo Määttä, Leena Harju and Jorma Viitala, and in Helsinki, Paavo Rissanen and Timo Klaukka (died 2009) who helped the study process to become reality.

I want to thank especially the occupational health care specialists, clinicians and nurses, in all the occupational health care units in Northern Finland who referred patients to the study for their contribution.

I would like to extend very warm thanks to all those patients I met during the study project. I got an enormous amount of knowledge about depression and work life from them during the interviews with them at the beginning of the study.

I am indebted to my parents, who have always encouraged me to believe in myself in a realistic way. Unfortunately, my father did not live to see the final results, and my mother is not able to be present on the occasion of the public defence of my thesis. I am sure that they would be proud of me.

I want to thank all the colleagues and the people near me for their support and encouragement.

Finally, I express my deepest thanks to my family for their patience and understanding and for reminding me of life and living outside of work, without forgetting our grandchildren – life goes on.

Oulu, February, 2016

Tero Raiskila

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## ORIGINAL PUBLICATIONS



# Obsessive-Compulsive Personality Disorder Is Common Among Occupational Health Care Clients With Depression

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**Objective:** To study how common personality disorders (PDs) are among employed subjects with first-episode depression. Depression is the single most common cause of working disability in Finland. Personality disorders are associated with depression. **Methods:** Subjects were screened using the Beck Depression Inventory scale, with a cutoff point greater than 9. The structured clinical interview for *Diagnostic and Statistical Manual*, fourth revision, was used to assess mental disorders. Inclusion criterion was major depressive disorder. **Results:** Most of the 272 participants were female (83%) and the majority (74%) were older than 40 years. The main finding was that one third of the participants had obsessive-compulsive PD. The prevalence of obsessive-compulsive PD was 50% among men and 28% in women. **Conclusion:** It is important to recognize comorbid PDs when assessing working-age persons experiencing depression.

Major depression was one of the top 10 contributors to the global burden of disease between 1990 and 2001.<sup>1</sup> The severity of a major depressive disorder (MDD) has been associated with increased unemployment, disability, and reduced work performance.<sup>2</sup> In Finland, the incidence of depression-related disability pensions over the years 1997 to 2006, in registry-based data comprising 272,000 persons per 10,000 person-years, was 22 for women and 16 for men.<sup>3</sup> In a Finnish population study,<sup>4</sup> the prevalence of depression among employed persons during the previous year was 5.3%.

The comorbidity of MDD with anxiety disorders, substance abuse,<sup>5</sup> and personality disorders (PDs) is quite common.<sup>6</sup> It has been estimated that approximately half of the psychiatric inpatients and outpatients with a current MDD have a comorbid PD.<sup>7</sup> In the general population, the point prevalence of PDs is 10% but the lifetime prevalence is probably 30% to 40%.<sup>8</sup>

Co-occurring PDs contribute significantly to impairment in social and emotional functioning and reduce well-being in patients with MDD.<sup>9</sup> PDs account for more impairment in functioning than MDDs alone.<sup>10</sup> Combined depression and PD is associated with a poorer outcome than depression alone.<sup>11</sup>

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There were no conflicts of interest including financial, consultant, institutional, and other relationships that lead to bias or a conflict of interest.

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DOI: 10.1097/JOM.0b013e3182717e6d

As far as we know, no earlier studies have dealt with the comorbidity of PDs and MDDs in occupational health care clients. The aim of the present study was to examine how common PDs are among employed persons seeking help for their first-episode depression in occupational health care. Clinical experience suggests that especially obsessive-compulsive personality disorder (OCPD) may be common among working-age persons with depression.

We hypothesized that PDs, especially OCPD, are common among employees with first-episode depression.

## MATERIAL AND METHODS

### Design

The present study forms one part of a rehabilitation intervention study project, which is aiming to measure the effectiveness of early rehabilitation of depressive disorders among employed persons (18 to 64 years) in Finland. The participants were recruited from 18 occupational health care units in Northern Finland during the years 2004 to 2009. Eligible subjects were randomized into an experimental and a control group. A short two-phase rehabilitation program was used for the experimental group; the controls received their usual depression treatment. This study focuses on the baseline features of participants in both the experimental and control groups pooled together.

### Inclusion and Exclusion Criteria

The inclusion criterion was a lifetime first episode of MDD according to the *Diagnostic and Statistical Manual*, fourth revision. Occupational health care physicians and nurses were asked to recruit patients for the project. Participants were screened using the Finnish version of the Beck Depression Inventory scale<sup>12,13</sup> using the cutoff point greater than 9. For the current depressive episode, antidepressive drug use for less than 6 months, sick leave less than 1 month, or both were allowed. Exclusion criteria included schizophrenia group disorders, organic mental disorders or substance abuse disorders, mental retardation, and depression, which could not be treated in occupational health care services (psychotic symptoms or high suicide risk) or required hospitalization. After being given a description of the study, all participants provided written informed consent. The ethical committee of the Northern Ostrobothnia Hospital District approved the study in 2004.

### Methods

The Structured Clinical Interviews for *Diagnostic and Statistical Manual*, fourth revision (SCID),<sup>14,15</sup> were used as a diagnostic method. The interview consisted of two parts: SCID I, for axis I disorders; and SCID II, for PDs. SCIDs were conducted by trained and experienced interviewers (mainly TR and SBS). All cases were reviewed together with a senior researcher (KL), who has a long experience of using the SCID. The Social and Occupational Functioning Assessment Scale (SOFAS)<sup>6</sup> was used to measure social and occupational functioning.

Participants were asked to complete questionnaires, including basic sociodemographic information and details of their current work situation. Marital status was dichotomized as married or cohabiting

versus single. Basic education was categorized into three groups according to the length of education as less than 9, 9 (comprehensive school), and more than 9 years. Vocational education was categorized into three groups according to the level and length of education. In the first group were the subjects with the lowest or without any vocational education, in the second group were the subjects with polytechnic education, and in the third and highest-level group were the subjects with a degree from university or university of applied sciences. Social class was defined on a nine-level Finnish classification based on the social appreciation of professions<sup>16</sup> and categorized into three groups.

**Subjects**

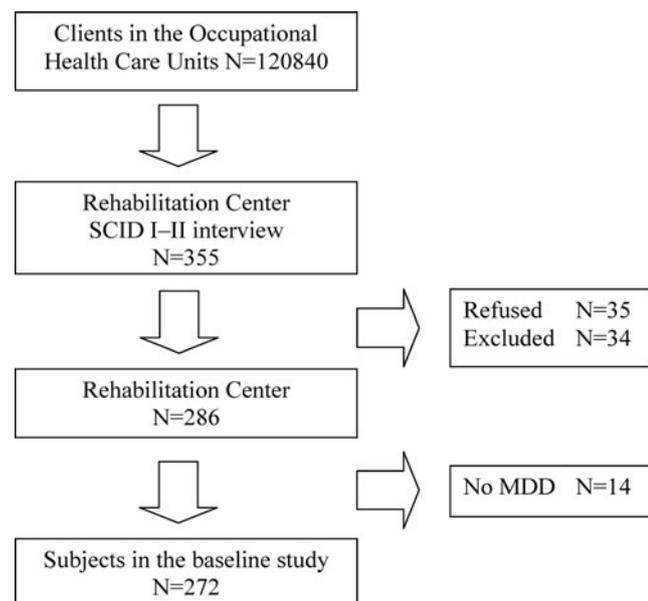
The participants were recruited from occupational health care units with approximately 120,840 clients (Fig. 1). A total of 355 participants were referred to the project. Of them, 272 were suitable according to the inclusion and exclusion criteria. Of these participants, 226 (83%) were female and 46 (17%) were male. The mean age was 44.0 years (standard deviation [SD], 10.2) for men and 45.2 years (SD, 8.1) for women.

**Statistical Methods**

For the comparison of categorical values, chi-squared and Fisher exact tests were used, when appropriate, in the bivariate comparisons and *t* test for continuous variables. The statistical analyses were performed with PASW Statistic 18 (SPSS, Inc, Chicago, IL).<sup>17</sup>

**RESULTS**

More than two thirds of the participants were married or cohabiting. Most of them were living in small counties. Four fifths had basic education more than the obligatory low level. More than 50 % of the participants had vocational education more than low level. Approximately half of the subjects worked in the public sector and half in the private sector. Two thirds of the participants belonged to the middle social class. There were no gender differences in the distribution of background factors except in employer status (Table 1). Women worked more commonly in the public sector than men.



**FIGURE 1.** Flowchart of the study. MDD, major depressive disorder; SCID I-II, structured clinical interviews for *Diagnostic and Statistical Manual*, fourth revision (axis I disorders and personality disorders).

**TABLE 1.** Sociodemographic Characteristics of the Participants

Variable	Men		Women		All		Gender Difference
	No.	%	No.	%	No.	%	<i>P</i>
Marital status							0.670
Cohabiting	34	73.9	160	70.8	194	71.3	
Other	12	26.1	66	29.2	78	28.7	
Population in the county							0.075
<7,000	17	37.0	54	23.9	71	26.1	
7,001–35,000	11	23.9	90	39.8	101	37.1	
>35,000	18	39.1	82	36.3	100	36.8	
Basic education							0.351
High	13	28.3	89	39.4	102	37.5	
Medium	22	47.8	88	38.9	110	40.4	
Low	11	23.9	49	21.7	60	22.1	
Vocational education							0.165
High	8	17.4	46	20.4	54	19.9	
Medium	11	23.9	81	35.8	92	33.8	
Low	27	58.7	99	43.8	126	46.3	
Status of employer							0.001
Public	13	28.2	131	58.0	144	52.9	
Private	29	63.0	83	36.7	112	41.2	
Other	4	8.8	12	5.3	16	5.9	
Social class							0.102
High	12	26.1	31	13.7	43	15.8	
Medium	23	50.0	139	61.5	162	59.6	
Low	11	23.9	56	24.8	67	24.6	

Most of the depressive episodes were mild (40.1%) or moderate (53.3%) (Table 2). Two thirds of the participants had SOFAS score of 61 to 70 indicating “Some difficulty in social, occupational, or school functioning, but generally functioning well, has some meaningful interpersonal relationships.”<sup>18</sup> There were no significant gender differences in the severity of depression or SOFAS score distribution.

**TABLE 2.** Severity of Depression and Social and Occupational Functioning of Participants

Variable	Men		Women		All		Gender Difference
	No.	%	No.	%	No.	%	<i>P</i>
Depression (Structured Clinical Interview for <i>Diagnostic and Statistical Manual</i> , fourth revision, Axis I Disorders)							0.334
Mild	22	40.1	87	38.5	109	40.1	
Moderate	20	53.3	125	55.3	145	53.3	
Severe	4	6.6	14	6.2	18	6.6	
Social and Occupational Functioning Assessment Scale*							0.491
0–60	7	15.9	40	18.1	47	17.7	
61–70	31	70.5	136	61.5	167	63.1	
71–99	6	13.6	45	20.4	51	19.2	

\*7 missing cases.

Of the participants, 109 (40.0%) had at least one PD, 32.0% had OCPD, 5.5% had avoidant PD, and 2.6% had other PDs. The prevalence of any PD was 56.5% among men and 36.7% ( $P = 0.013$ ) among women, respectively, and prevalence of OCPD was 50.0% and 28.3% ( $P = 0.004$ ), respectively. The participants with and without OCPD did not differ in terms of age distribution, marital status, or basic and vocational education (Table 3). Among subjects with OCPD, the proportion belonging to the highest social group was twice as high as in subjects without OCPD ( $P = 0.026$ ). There was no difference between the participants with or without OCPD in terms of SOFAS, or in levels of depression according to SCID.

**DISCUSSION**

The main finding of this study was that a third of the clients from the occupational health care units experiencing first-ever depressive episode had a comorbid OCPD. This finding is in line with the hypothesis that PDs, especially OCPD, would be common in first-episode depression. To the best of our knowledge, no earlier similar studies exist that explore PDs in working-age persons experiencing first-episode depression, using appropriate methods for psychiatric case identification.

In earlier studies of patients with depression, the most common comorbid PDs have been avoidant, borderline, and paranoid PDs.<sup>19–21</sup> Personality disorder diagnoses are common among untreated outpatients with MDD.<sup>22</sup> Avoidant PD, borderline PD, and OCPD have been identified as the most prevalent PDs among patients with depressive disorder.<sup>19</sup> According to a Finnish study of 269 patients with depressive disorder, one third had anxious or fearful PDs, including OCPD.<sup>23</sup> Personality disorders are more stable than MDDs.<sup>24</sup> In a Finnish study, severity of depression and existing comorbid PD were the two most important predictors of longer episode duration and recurrence of depression.<sup>25</sup> The prevalence of OCPD has been approximately 10% among patients with psychiatric disorder with depression.<sup>26</sup> We found a much higher prevalence. This difference may be due to our patient sample: the work environment may suit or even require personality traits typical of OCPD and

the people experiencing first-ever depressive episode all came from occupational health care units.

We found a clear gender difference in the prevalence of OCPD. In a large earlier population study in the United States dealing with 43,000 adults, the lifetime prevalence of OCPD was 7.8%, with the same rates for men and women.<sup>27</sup> According to a Norwegian population study with more than 2000 individuals, the prevalence of OCPD was twice as common in men as in women.<sup>28</sup> It has been stated that the distribution in prevalence of PDs is different in the United States compared with European and Nordic studies.<sup>29</sup> The gender difference noted in our study is in line with the Norwegian study.

It can be assumed that subjects with OCPD will have a tendency to overload their work tasks. They emphasize an effort in order, perfection, and the controlling of experiences and interactions at the expense of flexibility, transparency, and greater efficiency.<sup>30</sup> On the contrary, an equivalent mechanism among subjects with avoidant PD can also result in depression: these people are characterized by a pervasive pattern of social inhibition, feelings of inadequacy, extreme sensitivity to negative evaluation, and avoidance of social interaction.<sup>30</sup> It has been suggested that, in patients with OCPD, the impairment in general functioning, and particularly in social functioning, would be stable.<sup>31</sup> In OCPD, perfectionism can manifest in different ways. Usually perfectionist people set realistic standards for themselves, derive pleasure from their painstaking labor, and are capable of choosing to be less precise in certain situations. On the contrary, too neurotic perfectionists demand of themselves a usually unattainable level of performance, view their efforts as unsatisfactory, and are unable to relax their standards.<sup>32</sup>

An association between MDD and PDs has previously been identified. Personality disorders usually lead to MDD, but in some cases, depression may influence personality pathology, and may even lead to PDs.<sup>33</sup> Major depressive disorder may maintain PD diagnosis like OCPD, compared with patients initially diagnosed with MDD alone.<sup>34</sup> Specific PD comorbidity might affect the course of MDD by modulating factors that increase the overall risk of depression.<sup>35</sup> Personality disorders predict relapse after remission from an episode of MDD.<sup>36</sup> It can be proposed, with caution, that OCPD may lead to MDD.

One interesting finding in our study was that patients with depressive disorder with and without OCPD did not differ from each other in terms of many background factors (age, education, marital status) or in the severity of depression and functional status. In earlier studies,<sup>27,29</sup> PDs have been shown to be associated with low education, living alone, low income, and, especially, living in urban areas. One reason for this difference may be the fact that our sample only included people in employment. The prevalence of OCPD in our study was more common in the highest social group than in the lower social groups, but there were, however, no differences in the basic education. In the US population study mentioned previously,<sup>27</sup> OCPD was significantly more common in individuals with a low educational level. In the Norwegian population study, OCPD was more common in subjects with higher levels of education (ie, a college/university education) compared with those with less education.<sup>28</sup> Contrary to the present study, the Norwegian population study<sup>28</sup> found a positive association with OCPD and education.

The present study had several limitations. Most of the subjects were female, and the small proportion of male subjects diminished the statistical power. The small number of men is probably due to characteristics of the population from which the sample was drawn. In many of the occupational health care units used in the study, most clients were working in social and health care and education fields, where, in Finland, most employees are female. It should be noted that these results rest on the cross-sectional basic assessments completed in this project, so it is not possible to make any causal conclusions. The PD diagnoses were categorical. We did not measure the dimensionality of the PDs. To diagnose PDs during depressive

**TABLE 3.** Sociodemographic Factors of Participants With and Without OCPD

Variable	No OCPD		OCPD		Difference <i>P</i>
	No.	%	No.	%	
Sex					0.004
Male	23	26.4	23	12.4	
Female	162	73.6	64	87.6	
Marital status					0.575
Cohabiting	130	48.7	64	52.8	
Other	55	51.3	23	47.2	
Basic education					0.684
High	68	36.8	34	39.1	
Medium	78	42.2	32	36.8	
Low	39	21.0	21	24.1	
Vocational education					0.164
High	37	20.0	17	19.5	
Medium	56	30.3	36	41.4	
Low	92	49.7	34	39.1	
Social class					0.026
High	23	12.4	20	23.0	
Medium	110	59.5	52	59.8	
Low	52	28.1	15	17.2	

OCPD, obsessive-compulsive personality disorder.

episode is not unambiguous. The presence of PDs hinders alleviation of depressive symptoms in major depression.<sup>37</sup> It is difficult to diagnose PDs during a depressive episode because depression can include symptoms strongly suggestive of PD.<sup>38</sup> Nevertheless, Michels<sup>39</sup> notes that the assessment of personality is an important part of the assessment of any patient with depression and it can be conducted during an episode of depression. Skodol et al<sup>40</sup> have proposed that personality psychopathology should be assessed in all patients with MDD. Indeed, consideration of personality features is crucial to the understanding and management of major depression.<sup>41</sup>

The strengths of this study were that the subjects came from occupational health care units and the sample from the population was unselected. Because of the inclusion and exclusion criteria, the subjects represent a group of first-episode depression in working-age persons who did not have notable treatment for depression previously. The group was experiencing depression without other serious mental disorders, alcoholism, or psychotic disorders. The diagnoses were made by using appropriate interview techniques.

### CONCLUSION

A large proportion of the employees with depression also experience OCPD. Half of the men with depression also had OCPD. We assume that OCPD may lead to depression and cause working disability. The coexistence of OCPD with depression may increase the probability of working disability in middle age.

### ACKNOWLEDGMENTS

The study has been financed by a grant from the Social Insurance Institution, Helsinki, Finland. The authors want to thank the staff at Oulu Deaconess Institute Ltd, Oulu, Finland and all the participants.

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## Research Article

# The Impact of an Early Eclectic Rehabilitative Intervention on Symptoms in First Episode Depression among Employed People

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Received 18 July 2013; Revised 17 September 2013; Accepted 17 September 2013

Academic Editor: Bettina F. Piko

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*Objective.* To evaluate the effect of an early vocational-orientated eclectic intervention on Beck Depression Inventory (BDI) scores compared to treatment as usual in first ever depressive episode among employed people. *Design.* A randomized controlled trial comparing the rehabilitative intervention and the conventional treatment. *Subjects.* The subjects came from occupational health care units. *Methods.* Employees were sent to a rehabilitation center after being screened for depression using the BDI. They were diagnosed using the Structured Clinical Interview for DSM-IV. The participating subjects ( $N = 283$ ) were randomized into intervention and control groups. The intervention group received eclectic early depression intervention treatment ( $N = 134$ ) and the control group was treated in the conventional way ( $N = 100$ ). They were followed for one year. *Results.* The mean decrease in BDI scores within the intervention group was from 20.8 to 11.6 and within the control group from 19.3 to 10.8. BDI score decreased by 10 or more points in 64% of the participants in the intervention group and in 53% of the control group ( $P = 0.013$ ). *Conclusions.* There was some evidence that early eclectic intervention in first ever episode depression may be more effective than conventional treatments among working age people in employment.

## 1. Introduction

Depression is a common psychiatric disorder characterized by high rates of relapse and recurrence [1]. Treatment results in depression are not always satisfactory. According to the STAR\* D study, the overall cumulative remission rate when using antidepressive medication in the treatment of major depressive disorder (MDD), after four treatment steps, was less than 70% [2].

A review by Baumeister and Hutter [3] concluded that single interventions have little effect on outcomes in depressive patients. Instead, collaborative care interventions that focus on the work and family relations of an individual, and involve occupational health care workers and staff from psychiatric and psychological facilities, are efficacious in patients with depression. In contrast, a systematic review by Furlan et al. [4] concluded that there is insufficient evidence to determine which interventions are effective in managing depression in the workplace.

Several studies have stressed the importance of psychiatric vocational rehabilitation programs, including supported employment models with high levels of integration of psychiatric and vocational services and different psychosocial interventions designed to prevent prolonged working disability [5–7]. The early eclectic rehabilitative intervention program (EERIP) is a relatively new practice used to help working age people with various levels of depression [8]. This intervention comprises a psychologically orientated vocational rehabilitation program, which addresses the specific needs of people in employment.

The aim of this study was to examine the effect of the EERIP on depressive symptoms in subjects with an acute presentation of first ever depression. We hypothesized that the intervention program would be effective in reducing depressive symptoms.

## 2. Materials and Methods

**2.1. Design.** The present study forms part of a rehabilitation project, designed to measure the effectiveness of an EERIP on first ever depressive disorders among employed persons (18–64 years) in Finland. The study design, recruitment, and methods have been described in detail previously [9]. The participants were recruited from 18 occupational health care units in Northern Finland between the years 2004 and 2009 (Figure 1). Eligible subjects were randomized into interventional and control groups. A two-phase rehabilitation program was used for the intervention group; the control group received treatment as usual (TAU).

**2.2. Inclusion and Exclusion Criteria.** The inclusion criterion was a lifetime first episode of major depression. Occupational health care physicians and nurses were asked to recruit patients for the project. Participants were screened using the Finnish version of the BDI [10, 11] with a cutoff score of >9. For the current depressive episode, antidepressive drug use for less than six months and/or sick leave for less than one month was allowed. Subjects with schizophrenia group disorders, organic mental disorders, substance abuse disorders, or mental retardation were excluded. Moreover, subjects with depression that could not be treated in occupational health care services (psychotic symptoms or high suicide risk) or that required hospitalization were excluded. After being given a detailed description of the study, all participants provided written informed consent. The ethical committee of the Northern Ostrobothnia Hospital District, Oulu, Finland, approved the study in 2004.

**2.3. Subjects.** The participants were recruited from occupational health care units with about 120,840 clients (Figure 1). A total of 355 subjects were referred to the project, and 283 of them were randomized into the intervention ( $N = 142$ ) and control groups ( $N = 141$ ). Eight of the subjects were excluded at the baseline, so the number of participants was 275: 141 in the intervention group and 134 in the control group. After one year of followup, the intervention group consisted of 134

participants, 79.1% female, and the control group contained 100 participants, 92.0% female.

**2.4. Methods.** The Structured Clinical Interview for DSM-IV (SCID I-II) [12, 13] was used as a diagnostic tool. The interview consists of two parts: SCID I, for axis I disorders, and SCID II, for personality disorders (PDs). SCID interviews were conducted by trained and experienced interviewers (mainly TR and SB). All cases were reviewed together with a senior researcher (KL), who has long experience of using the SCID. The severity of depression at baseline was defined in the SCID I interviews as mild, moderate or severe and using the Finnish version of the BDI [10, 11]. The range of the BDI score is 0–63: 0–9 indicating no depression, 10–16 mild depression, 17–29 moderate, and 30–63 severe depression.

In the SCID II interviews, the presence of any comorbid PD was assessed. Obsessive compulsive personality disorder (OCPD) was used as a potential confounder as it has been found to be prevalent in the present sample [9]. Comorbid OCPD may cause greater functional impairment in patients than depressive disorder alone [14, 15].

Participants were asked to complete questionnaires, including basic socio-demographic information, details of their current work situation, and use of antidepressive medication. Marital status was dichotomized: married or cohabiting versus single. Basic education was categorized into three groups according to the duration of education: less than nine years, nine years (comprehensive school), and more than nine years. Vocational education was categorized into three groups according to the level and length of education: lowest or without any vocational education/polytechnic education/a degree from university or university of applied sciences. Social class was categorized into three groups and defined using a nine-level Finnish classification system based on the social appreciation of professions [16].

**2.5. Early Eclectic Rehabilitative Intervention Program (EERIP).** The rehabilitation process was conducted by a multiprofessional working group consisting of a psychologist, social worker, psychiatrist, physician, and physiotherapist in a rehabilitation institute, the Oulu Deaconess Institute. The working group remained the same throughout the entire field study period of 2004–2009. The intervention consisted of two types of courses, of which the first and the second were research courses and the third and fourth were rehabilitation courses. The entire rehabilitation process took 6 months and included 31 active days. The research courses focused on individual vulnerability factors of depression, which varied from work-related and family-related stressors to person-related stressors. Based on individual stressors, each participant received tasks to be completed during the rehabilitation process. The research courses were arranged for groups including 3–5 participants. The courses consisted of two 5-day-long periods with 3–4 week intervals. During the intervals, participants focused on their individual tasks [8]. The rehabilitation courses were scheduled 3–4 months after the research courses. They consisted of one 14-day-long and one 7-day-long course with a 3–4-week interval and

were performed in groups of 5–8 participants, not necessarily containing the same people as in the research courses. The group working methods were based on eclectic practice, including both cognitive behavioral and psychodynamic principles [8]. Participants were resident at the Oulu Deaconess Institute during the courses, that is, living away from their normal circumstances.

The aims of both the Research and Rehabilitation courses were to increase self-knowledge of depressive symptoms and to provide peer and social support. In the case of work-related stressors, collaboration with employers and occupational health care services was included in the process. This involved rehabilitation personnel visiting the participants' work places in order to identify potential changes in the working conditions to reduce work-related stress. In the case of subjects with family-related stressors, the family members or other close intimates were included in the process. Spouses were asked to participate in family therapeutic sessions when required. A psychophysical physiotherapeutic approach to depression was adopted, emphasizing the interaction between mind and body. The aim was that the depressed participants could, through physical and body training and the use of relaxation techniques, recognize the importance of body reactions [17, 18].

A comparison of differences in the management of depression, using either EERIP or conventional treatments that followed Finnish treatment guidelines [19], is described in Table 1.

**2.6. Statistical Methods.** The outcome of the participants during the one-year followup period was determined using the BDI. Differences in the BDI between the intervention and control groups, and any changes during the one year followup, were analyzed using four outcome measures based on the sum score of the BDI. Firstly, we recorded the proportion of participants whose BDI score was less than 10 points (i.e., no depression) at the end of one-year followup. Secondly, we examined the proportion of subjects whose BDI score had decreased more than 50% during the followup. Thirdly, the proportion of subjects whose BDI score had decreased by more than 9 points during the followup was calculated. Finally, the change in mean sum score of the BDI was analyzed.

When appropriate, Chi square and Fischer's exact tests were used for bivariate comparison of categorical variables, and Student's *t*-test was used for continuous variables. A logistic regression model was used to examine the likelihood for the failure to decrease by 9 points or more in the BDI score during the one-year follow-up time. The covariates used in a logistic regression model were those which showed a statistically significant bivariate association with the study group. All tests were two-tailed, and a limit for statistical significance was set at  $P < 0.05$ . All statistical analyses were performed using PASW Statistic 18 [20].

We conducted an attrition analysis, comparing subjects who were included at the baseline, but who did not participate at the follow-up phase ( $n = 41$ ), to those who did participate at the one-year follow-up phase ( $n = 234$ ). Most of the

dropouts (82.9%) were from the control group ( $P < 0.001$ ). The drop outs did not, however, differ from the participants in terms of age, gender, OCPD, or the severity of depression measured by BDI or SCID I at the baseline.

We also used the last-observation carried forward (LOCF) approach, assuming that the BDI scores of the dropouts remained the same at followup as they were at baseline. In these analyzes, the number of subjects in the intervention group was 134 and in the control group 127.

### 3. Results

The sociodemographic and clinical characteristics of the subjects are shown in Table 2. The mean age for males was 44.6 years (standard deviation = SD 10.0) and 45.3 years for females (SD 8.1), ( $P = 0.639$ ). Twenty-eight participants, 20.9%, in the intervention group and eight participants, 8.0%, in the control group were male. Of the participants, 169, 72.2%, were married or cohabiting and 112, 57.1%, were 40–50 years of age. Of the participants, 182, 77.8% were educated beyond the compulsory level. Of the participants, 137, 52.6%, had vocational education higher than the lowest level. Of the participants 139, 59.4%, had middle social status. The proportion of subjects with high social status was greater in the intervention group compared to the control group. Of the participants, 131, 56.7%, worked in the public sector. Of all sociodemographic variables, statistically significant differences between the intervention and control groups were found in gender ( $P = 0.007$ ) and social class ( $P = 0.030$ ). In the clinical variables, less than every third person used antidepressive medication at the start of followup. The prevalence of OCPD was almost twofold in the intervention group compared to the control group, and this difference between study groups was statistically significant ( $P = 0.028$ ).

According to the SCID I interviews, 34.3% of participants in the intervention group had mild, 59.0% moderate, and 6.7% severe major depression at baseline. In the control group the respective rates were 49.0%, 45.0%, and 6.0% ( $P = 0.075$ ). The mean BDI score at the beginning of the study was 20.8 (SD 7.3) in the intervention group and 19.3 (SD 7.4) ( $P = 0.136$ ) in the control group and, after one year of followup, 9.1 (SD 9.1) and 8.8 (SD 8.1), ( $P = 0.858$ ), respectively. The mean decrease in BDI scores in the intervention group was 11.6 (SD 10.0) and 10.8 (SD 9.8) in the control group. The decrease was statistically significant within both of the groups ( $P < 0.001$ ).

Of the all four outcome measures, the only significant difference between the study groups was found in the decrease in BDI scores over 9 points during the one-year follow-up period. This was the case in two-thirds of the intervention group and in half of the control group ( $P = 0.013$ ; Table 3). When this association was modeled with a logistic regression analysis (Table 4), after controlling for participants' gender, OCPD, and social class, the result remained statistically significant. When compared to the intervention group, the likelihood of control group members not having a decrease of 9 points or more in BDI score during the followup was 1.89 (CI 1.06–3.37,  $P = 0.030$ ).

TABLE 1: Recommendations in the Early Eclectic Rehabilitative Intervention Program versus the Finnish Guidelines for managing depression: Early Eclectic Rehabilitative Intervention Program versus the Finnish Guidelines.

Components	Intervention group (EERIP) <sup>1</sup>	Control group (FGL) <sup>2</sup>
Antidepressive medication	Yes	Yes
Cognitive or other individual therapy	Yes	Yes
Work orientation	Yes	Yes/No
Family orientation	Yes	Yes/No
Group therapy methods	Yes	No
Duration of intensive interventions	6 months	No recommendation

<sup>1</sup>EERIP: Early eclectic rehabilitative intervention group.

<sup>2</sup>FGL: Finnish guide lines for managing depression.

TABLE 2: Socio-demographic and clinical characteristics of the participants.

Variable	Intervention group <i>N</i> = 134		Control group <i>N</i> = 100		Difference <i>P</i> -value
	<i>N</i>	%	<i>N</i>	%	
Gender					
Male	28	20.9	8	8.0	0.007
Female	106	79.1	92	92.0	
Marital status					
Cohabiting	96	71.6	73	73.0	0.819
Other	38	28.4	27	27.0	
Age groups					
<40 years	33	24.6	21	21.0	0.781
40–50 years	62	46.3	50	50.0	
>50 years	39	29.1	29	29.0	
Basic education					
High	53	39.5	37	37.0	0.893
Medium	51	38.1	41	41.0	
Low	30	22.4	22	22.0	
Vocational education					
High	30	22.4	20	20.0	0.059
Medium	57	42.5	30	30.0	
Low	47	35.1	50	50.0	
Status of employer					
Public	74	56.1	57	57.5	0.635
Private	52	39.4	35	39.4	
Other	6	4.5	7	7.1	
Social status					
High	24	17.9	10	10.0	0.030
Medium	83	61.9	56	56.0	
Low	27	20.2	34	34.0	
Antidepressive medication					
Yes	38	28.4	29	29.3	0.885
No	96	71.6	70	70.7	
Obsessive-compulsive personality disorder					
Yes	41	30.6	18	18.0	0.028
No	93	69.4	82	82.0	

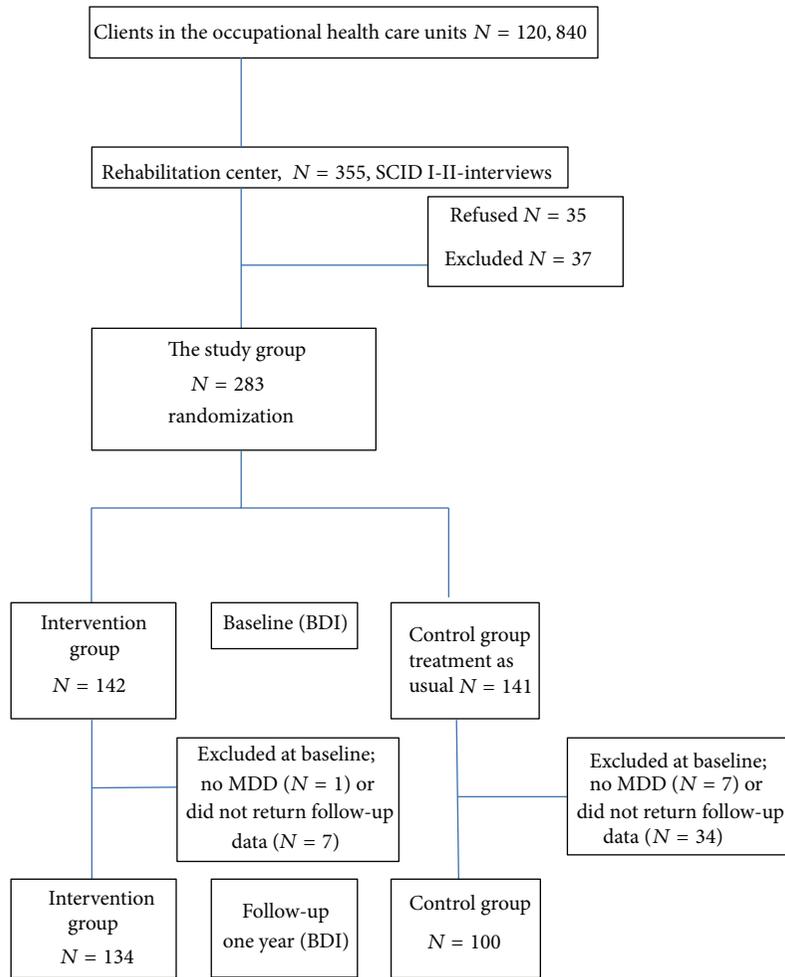


FIGURE 1: The flow chart of subjects randomized and followed by Beck Depression Inventory (BDI).

TABLE 3: The Beck Depression Inventory (BDI) scores and changes in BDI scores during the follow up period, measured in four different ways in the intervention and control groups.

(a)

BDI score changes	Intervention group (n = 134)		Control group (n = 100)		Difference $\chi^2$ -test, P-value
	N	%	N	%	
<10 at the end of the study					
No	51	38.6	39	39.4	0.907
Yes	81	61.4	60	60.6	
Decreased $\geq 50\%$ during the study					0.329
No	46	35.7	39	42.4	
Yes	83	64.3	53	57.6	
Decreased >9 points during the study					0.013
No	46	35.7	17	46.7	
Yes	83	64.3	49	53.3	

(b)

Mean changes in the BDI scores <sup>2</sup>	Intervention group (n = 134)			Control group (n = 100)			T-test, P-value
	N	Mean	SD <sup>3</sup>	N	Mean	SD	
	129	-11.6	10.0	92	-10.8	9.8	0.525

TABLE 4: The effect of the intervention on changes in the BDI scores, using the logistic regression model.

Variable	Failure to have decrease in BDI scores > 9 (% <sup>1</sup> )	OR <sup>2</sup>	95% CI <sup>3</sup>	P-value
Group				
Control	46.7	1.89	1.06–3.37	0.030
Intervention (ref)	35.7			
Gender				
Male	50.0	1.79	0.85–3.77	0.104
Female (ref)	38.4			
OCPD				
Yes	47.4	1.49	0.79–2.81	0.172
No (ref)	37.8			
Social status				
Low	36.2	0.74	0.39–1.42	0.368
High + moder (ref)	41.7			

Note: 13 cases missing.

<sup>1</sup>Failure: BDI score did not decrease 10 points or more. The control group was compared with the intervention group taking into account gender, obsessive compulsive personality disorder (OCPD) and social group.

<sup>2</sup>OR: Odds Ratio.

<sup>3</sup>CI: Confidence Interval.

In the LOCF analyzes, three of the four outcome measures were significant. BDI scores decreased over 50% in 60.6% in the intervention group and 42.7% ( $P = 0.004$ ) in the control group. BDI decreased over nine points in 60.6% in the intervention group and 39.5% ( $P < 0.001$ ) in the control group. Mean decrease of the BDI scores was 10.9 (SD 10.0) in the intervention group and 8.0 (SD 9.7;  $P = 0.016$ ) in the control group.

#### 4. Discussion

The purpose of this study was to examine the effect of the EERIP on depressive symptoms in subjects with an acute onset of first ever depression. The main finding of this study was that, in first ever episodes of depression among working age employed people, the early eclectic rehabilitative intervention program (EERIP) may be more effective in reducing symptoms of depression than treatment as usual (TAU). However, the effect on symptom level of depression was only minimal. Out of four measures of symptom level changes, only one was statistically significant (a decrease in BDI score >9 points). Our findings support, in part, the hypothesis that the EERIP would be effective in reducing depressive symptoms. To the best of our knowledge, no similar earlier studies exist exploring the effectiveness of an eclectic rehabilitative intervention in working age persons experiencing first episode depression.

The results of rehabilitative interventions in early depression are contradictory. The positive influence of the interventions in managing depression has been observed in various studies [21–25]. A resource-building group intervention used to strengthen recovery from depression has been shown to improve mental health among employees with elevated levels of depression [26]. However, a systematic review by Furlan et al. [4] concluded that, to date, there is insufficient evidence

to determine which interventions are effective in managing depression in the workplace. A recent Finnish cohort study of 50,000 employees conducted by Saltytchev (2012) did not find any evidence of the effectiveness of vocationally oriented medical rehabilitation amongst public sector employees [27]. The results in this study demonstrate that early eclectic rehabilitative intervention is not a particularly powerful tool, but it provides an additional useful option for the management of depression in employed people.

The EERIP included collaborative work with the participants' employers. The aim was to identify possible recommendations for changes in working conditions and environment in order to reduce work-related stress. The active collaborative work conducted during the intervention process may explain why the participants in the intervention group benefited from the EERIP. Andrea et al. [28] have encouraged the use of intervention studies to test whether changes in the work place or in the psychosocial work environment reduce depressive symptoms among employees. Dietrich et al. [29] have suggested that more tailored interventions, targeting depression directly, are needed in the workplace. There is a need for new strategies in clinical practice with regard to the psychosocial work environment and disability due to mental disorders [30, 31].

The EERIP provided the opportunity for the subjects to obtain peer support, to reduce the stigma associated with mental health, and to better understand the features of depression. Other workers and lay people may show ignorance with regard to the causes and treatment of mental disorders [32]. Peer support interventions versus usual care have been shown to be superior in reducing symptoms of depression [33]. In the present rehabilitative intervention, peer and social support were emphasized, with the focus on the role of social support via collaborative action with

employers and family members. This may partly explain the better results in the EERIP group.

**4.1. Limitations.** This study had several limitations. Of the subjects, only 8% were male in the control group and 21% in the EERIP group, which limits our ability to generalize the results to males. The small number of males is probably due to characteristics of the population from which the sample was drawn. In many of the occupational health care units involved in the study, most clients were working in social and health care and education professions in which the majority of employees tend to be females. Moreover, a high number of the dropouts in the control group were male. One limitation may be that most of the dropouts were from the control group. It may be that the intervention motivated more subjects to participate than treatment as usual. The proportion of OCPD in our study was higher in the EERIP group than in the control group. In the EERIP group, there were more subjects belonging to the highest social group than the lower social groups. OCPD probably impairs recovery from depression [34]. However, we did not find any differences in the recovery between subjects with and without OCPD, or belonging to low or high/moderate social class. A followup period of one year may be too short to evaluate the long-term effect of the rehabilitative intervention. More time would be needed to fully implement cognitive tools and to establish new behaviors [25]. The EERIP took 6 months and included 31 active days. We had no detailed information of the resources and practices in the occupational health care units concerning the management of depression (i.e., treatment as usual), and we did not know to what extent the recommended guidelines for the treatment of depression were being followed [19]. The use of a self-report inquiry, like BDI, may be not as reliable as using rating scales or standardized psychiatric interview techniques in evaluating the severity of depression. However, the BDI is widely used in depression treatment studies [35].

**4.2. Strengths.** The strengths of this study include the use of a control group in a randomized design. Due to the inclusion and exclusion criteria, the subjects represent a group with first episode depression in working age people who did not have notable treatment for depression previously. The group was suffering from depression without other disorders, such as substance abuse or psychotic disorders. Diagnoses were made using an appropriate interview technique. The LOCF analyses supported our results with the full followup data. A notable factor in the intervention process was the multiprofessional working group and the fact that the group remained the same during the entire process (from 2004 to 2009), thus ensuring quality and consistency in the intervention process. To our knowledge, comparative studies focusing on this type of rehabilitative intervention among employed people have not been conducted previously.

## 5. Conclusions

The results show some potentially beneficial effect of EERIP intervention. The early eclectic intervention program may represent a useful addition to the management of the complex and multifactorial syndrome of depression, improving occupational care units' ability to help and treat employees presenting with a first ever episode of depression.

## Funding

The study has been funded by the Social Insurance Institute of Health of Finland.

## Conflict of Interests

The authors have no conflict of interests. There was no conflict of interests including financial, consultant, institutional and other relationships that lead to bias or a conflict of interests.

## Acknowledgments

The study has been financed by a Grant from the Social Insurance Institution, Helsinki, Finland. The authors want to thank the staff at Oulu Deaconess Institute Ltd, Oulu, Finland, and all the participants.

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## The Effect of an Early Rehabilitation on Alexithymia among First Ever Depressive Occupational Health Care Clients

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Rec date: May 07, 2014, Acc date: Jul 21, 2014, Pub date: Jul 25, 2014

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### Abstract

**Objectives:** Depression is a common psychiatric disorder. Alexithymia and depression are highly associated. We explored the impact of an early vocationally orientated, eclectic rehabilitative intervention on alexithymia among clients with first ever diagnosed depressive episode.

**Methods:** Clients from occupational health care units were screened for depression with the Beck Depression Inventory (BDI) and diagnosed with the Structured Clinical Interview for DSM-IV. The participants were randomized into intervention and control groups. The intervention group received eclectic early rehabilitative intervention and the control group was treated as usual. The intervention (N=134) and control groups (N=100) were compared using the Toronto Alexithymia Scale (TAS-20) at the baseline and after one year follow-up.

**Results:** The prevalence of alexithymia decreased both in the intervention group (from 20.1% to 18.9%) and in the control group (from 16.0% to 7.1%). The prevalence of alexithymia was significantly lower at the follow up in the control group than in the intervention group ( $p=0.010$ ). The changes in the mean scores of the four alexithymia variables between the groups were not statistically significant after adjusting for confounding factors.

**Conclusions:** The findings were against our hypothesis that alexithymia would diminish in the intervention group more than in the control group. There are several explanations for this unexpected result. We believe that the reasons were that the intervention was too short and that the group-shaped method was too demanding for the subjects with alexithymia.

**Keywords:** Alexithymia; Depression; Rehabilitation; Intervention

### Introduction

Depression is a common psychiatric disorder characterized by a high rate of relapse and recurrence [1]. Alexithymia is a multidimensional personality trait characterized by deficits in regulating, experiencing, identifying feelings and verbalizing emotions [2,3]. Alexithymia and depression are highly associated [4-6], and alexithymia may increase vulnerability to depressive symptoms [7,8]. The alexithymia construct has assumed to be a stable personality trait rather than a state-dependent phenomenon [9-12]. According to Tolmunen et al. [7], both the absolute and relative stability of alexithymia in the general population are high, even for a long follow-up period.

Several studies have stressed the importance of psychiatric vocational rehabilitation programs, including supported employment

models with high levels of integration of psychiatric and vocational services, and also of different psychosocial interventions in preventing prolonged working disability [13-15]. The effect of rehabilitative interventions in subjects with alexithymia has mainly been studied with somatic diseases [16-18]. The concept of the early eclectic rehabilitative intervention program (EERIP) is relatively new and is used in helping working age people with various levels of depression [19]. This intervention comprises a psychologically orientated vocational rehabilitation program, which addresses the specific needs of people in employment. The aim of the present study was to examine the effect of a rehabilitative intervention on alexithymia in subjects among occupational health care clients with first episode depression, because of the high association between alexithymia and depression. Our hypothesis was that alexithymia would diminish after one year of follow up time more in the intervention group than among the controls who received treatment as usual.

## Materials and Methods

### Design

The present study forms a part of a rehabilitation intervention study project, designed to measure the effectiveness of an EERIP on first ever depressive diagnosed disorders among employed persons (18-64 years) in Finland. The study design, recruitment and methods have been described in detail previously [20]. The participants were recruited from 18 occupational health care units in Northern Finland between the years 2004-2009 (Figure 1). Eligible subjects were randomized into an intervention and a control group. A two phase rehabilitation program was used for the intervention group; the controls received treatment as usual (TAU). This study investigates the impact of rehabilitative intervention on alexithymia in subjects with first episode depression among occupational health care clients.

### Inclusion and exclusion criteria

The inclusion criterion was a lifetime first diagnosed episode of major depression. Occupational health care physicians and nurses were asked to recruit patients for the project. Participants were screened using the Finnish version of the Beck Depression Inventory (BDI) [21,22] with the cut-off point of >9. For the current depressive episode, antidepressive drug use for less than six months and/or sick leave for less than one month were allowed. Exclusion criteria included: schizophrenia and other psychotic disorders, organic mental disorders or substance abuse disorders, mental retardation and depression that could not be treated in occupational health care services (psychotic symptoms or high suicide risk), or that required hospitalization. After being given a description of the study, all participants provided written informed consent. The ethical committee of the Northern Ostrobothnia Hospital District, Oulu, Finland approved the study in 2004.

### Methods

The Structured Clinical Interview for DSM-IV (SCID I-II), [23,24] was used as a diagnostic tool. The interview consists of two parts: SCID I, for axis I-disorders and SCID II, for personality disorders. SCID-interviews were conducted by trained and experienced interviewers (mainly TR and SB). All cases were reviewed together with a senior researcher (KL), who has a long experience of using the SCID. The severity of depression at baseline was defined in the SCID I interviews as mild, moderate or severe, and using the Finnish version of the BDI [21,22].

The 20-item version of the Toronto Alexithymia Scale (TAS-20) was used as the measure of alexithymia. Of the different methods for measuring alexithymia, the TAS-20 is the most widely used and presumably the most carefully validated one. Its internal consistency, test-retest reliability, convergent, discriminant, and concurrent validity have been demonstrated to be good [25-28]. The psychometric properties of the Finnish version of the TAS-20 have been shown to be satisfactory [29]. The items are rated on a 5-point scale ranging from "strongly disagree" to "strongly agree". According to the recommendation by the developers of the scale, the cut point of alexithymia was also used: TAS-20 total scores >60 are defined as alexithymic [3,30]. The TAS-20 has a three-factor structure; TASfactor1 assesses difficulty in identifying feelings (=DIF), TASfactor 2 concerns itself with difficulty in describing feelings (=DDF) and TASfactor 3 reflects externally-oriented thinking (=EOT), [30].

The primary outcome measure was the change in mean total TAS score between the baseline and one year follow up phase. The secondary outcome measure was the change in prevalence of alexithymia during the one year follow up time. Comparison of change both in primary and secondary outcome measures between the intervention and control groups formed the main result of the analysis.

Participants were asked to complete questionnaires, including basic socio-demographic information, details of their current work situation, and use of antidepressive medication. Marital status was dichotomized: married or cohabiting vs. single. Basic education was categorized into three groups according to the length of education, less than nine years, nine years (comprehensive school) and more than nine years. Vocational education was categorized into three groups according to the level and length of education: lowest or without any vocational education / polytechnic education / a degree from university or university of applied sciences. Social class was defined on a nine-level Finnish classification based on the social appreciation of professions [31] and categorized into three groups.

### Early eclectic rehabilitative intervention program (EERIP)

The rehabilitation process was implemented by a multi professional working group consisting of a psychologist, social worker, psychiatrist, physician and physiotherapist in a rehabilitation institute. The working group remained the same during 2004-2009. The intervention consisted of two types of courses, of which the first and second were research courses and third and fourth were rehabilitation courses. The entire rehabilitation process took 6 months and included 31 active days. The Research Courses focused on individual predictors of depression, which varied from work-related and family-related stressors to person-related stressors. Based on individual stressors, each participant received tasks to be completed during the rehabilitation process. The courses were arranged for groups including 3-5 participants, and they consisted of two 5-day-long periods with 3-4 weeks intervals. During the interval, participants focused on their individual tasks [19]. The Rehabilitation Courses were scheduled 3-4 months after the research courses. They consisted of one 14-day-long and one 7-day-long course with a 3-4 week interval and were performed in groups including 5-8 participants, not necessarily the same group as in the Research Courses. The group working methods were based on eclectic practice including both cognitive behavioral and psychodynamic principles [19]. During the courses, participants were resident at the ODL rehabilitation institute that is, staying outside from their normal circumstances.

The aims of both the Research and Rehabilitation courses were to increase self-knowledge of depressive symptoms, and to provide peer and social support. In the case of work-related stressors, collaboration with employers and occupational health care services was included in the process. This involved rehabilitation personnel visiting the participants' work places in order to identify possible recommendations for changes in the working conditions to reduce work related strain. In the case of subjects with family related stressors, the family members or other close intimates were included in the process. Spouses were asked to participate in family counseling sessions when required. A psychophysical physiotherapeutic approach to depression was adopted, emphasizing the interaction between mind and body. The aim was that the depressed participants could, through physical and body training and the use of relaxation technics, recognize the importance of body reactions [32-34]. Alexithymia per

se was not in focus in the rehabilitation program and the staff did not know if the participants were alexithymic or not.

A comparison of differences in the management of depression, using either EERIP or conventional treatments that followed the Finnish treatment guide lines [35] for treatment as usual, is described in Table 1.

Components	EERIP	FGL
Antidepressive medication	Yes	Yes
Cognitive or other individual therapy	Yes	Yes
Work orientation	Yes	Yes/No
Family orientation	Yes	Yes/No
Group therapy methods	Yes	No
Duration of intensive interventions	6 months	No recommendation

**Table 1:** Comparison of recommendations by the Early Eclectic Rehabilitative Intervention Program (EERIP) and by the Finnish Guide lines<sup>a</sup> (FGL)

<sup>a</sup>The Finnish Guide Lines of managing depression (Isometsä et al., 2009)

## Subjects

The participants were recruited from occupational health care units with about 120,840 clients (Figure 1). A total of 355 subjects were referred to the project, and 283 of them were randomized into the intervention (N=142) and control groups (N=141). Eight of the subjects were excluded at the baseline, so the number of participants was 275; in the intervention group 141 and in the control group 134. After one year of follow up the intervention group consisted of 134 participants, 79.1% females and the control group of 100 participants, 92.0% females. The mean age for males was 44.6 years (standard deviation, SD 10.0) and 45.3 years for females (SD 8.1), (p=0.639).

## Attrition analysis

We conducted an attrition analysis, comparing subjects who were included at the baseline and randomized into intervention and control groups, but did not participate at the follow-up phase (N=41) to those who did participate at the one year follow-up phase (N=234). The drop outs did not differ from the participants in terms of age, gender, the severity of depression measured by BDI, or SCID I, or alexithymia at the baseline. Most of the drop outs (82.9%) were from the control group (p<0.001), of whom 11 (26.8%) were males, eight with alexithymia (72.7%), and 30 females (73.2%), three with alexithymia (p< 0.001).

## Statistical methods

For the comparison of categorical values, Chi-square and Fischer's exact tests were used, when appropriate, in bivariate comparisons and Student's t-test for continuous variables. Linear regression models adjusted for sex, social group and BDI score at the baseline were used for multivariate analyses. All statistical analyses were performed with PASW Statistic 18 [36].

## Results

The groups did not differ statistically regarding socio-demographic background (Table 2). One fifth of the participants in the intervention group and eight percent in the control group were males. Almost three-fourths were married or cohabiting and over half were 40-50 years of age. Four-fifths had basic education more than the obligatory low level. Over fifty percent of the participants had vocational education higher than the lowest level. Two-thirds belonged to the middle social class. The proportion of the subjects in the highest social class in the intervention group was higher compared to the control group. More than half worked in the public sector. Less than every third used antidepressive medication at the base line situation.

Variable	Intervention group		Control group		All		Difference
	N	%	N	%	N	%	
<b>Gender</b>							
Male	28	20.9	8	8.0	36	15.4	0.007
Female	106	79.1	92	92.0	198	84.6	
<b>Marital status</b>							
Cohabiting	96	71.6	73	73.0	169	72.2	0.819
Other	38	28.4	27	27.0	65	27.8	
<b>Age groups</b>							
<40 years	33	24.6	21	21.0	54	8.2	0.781
40-50 years	62	46.3	50	50.0	112	57.1	
>50 years	39	29.1	29	29.0	68	34.7	
<b>Basic education</b>							0.893
High	53	39.5	37	37.0	90	38.5	
Medium	51	38.1	41	41.0	92	39.3	
Low	30	22.4	22	22.0	52	22.2	
<b>Vocational education</b>							0.059
High	30	22.4	20	20.0	50	21.4	
Medium	57	42.5	30	30.0	87	37.2	
Low	47	35.1	50	50.0	97	41.4	
<b>Status of employer<sup>a,b</sup></b>							0.635
Public	74	56.1	57	57.5	131	56.7	
Private	52	39.4	35	39.4	87	37.7	
Other	6	4.5	7	7.1	13	5.6	
<b>Social class</b>							
High	24	17.9	10	10.0	34	14.5	0.030
Medium	83	61.9	56	56.0	139	59.4	
Low	27	20.2	34	34.0	61	26.1	

Antidepressive medication <sup>b</sup>							0.885
Yes	38	28.4	29	29.3	67	28.8	
No	96	71.6	70	70.7	166	71.2	
The classification of depression (SCID) <sup>c</sup>							
Mild	39	29.1	42	42.0	81	34.6	0.157
Moderate	79	59.0	45	45.0	124	53.0	
Severe	9	6.7	6	6.0	15	6.4	
Other	7	5.2	7	7.0	14	6.0	
The classification of depression at the baseline (BDI) <sup>d</sup>							
Mild	39	29.8	41	44.1	80	35.7	0.073
Moderate	74	56.5	44	47.3	118	52.7	
Severe	18	13.7	8	8.6	26	11.6	

**Table 2:** Socio-demographic and clinical characteristics of the participants

<sup>a</sup>two missing cases in the intervention group

<sup>b</sup>one missing case in the control group

<sup>c</sup>Structured Clinical Interview for DSM-IV

<sup>d</sup>Beck Depression Inventory, four cases missing

The prevalence of alexithymia at the baseline was 20.1% in the intervention group and 16.0% (p=0.418) in the control group. Respective figures at the follow-up were 18.9% and 7.1% (p=0.010). The decrease in the prevalence of alexithymia was statistically significant in the control group (p=0.012), but was not in the intervention group (p=0.848). The prevalence of alexithymia was significantly lower at the follow up in the control group than in the intervention group (p=0.010), (Table 3). The mean scores of alexithymia decreased in both groups (Table 3). The changes in the mean scores between the groups were not statistically significant after adjusting for confounding factors (Table 4). There was no difference between the groups in the severity of depression according to SCID I-interviews and BDI – scores at the baseline (Table 2). The mean BDI scores at the beginning of the study were 20.8 (SD 7.3) in the intervention group and 19.3 (SD 7.4), (p=0.136) in the control group, and after the follow up, 9.1 (SD 9.1) and 8.8 (SD 8.1), (p=0.858), respectively. The mean decrease in BDI scores in the intervention group was 11.6 (SD 10.0) and in the control group 10.8 (SD 9.8). The decrease was statistically significant within both of the groups (p<0.001), but no difference was found between the groups. Change in BDI scores correlated positively with change in total alexithymia scores both in the intervention group and in the control groups (r2=0.22 and r2=0.12, respectively).

Variable	Intervention group		Control group		Difference
	N	%	N	%	
Alexithymia at the baseline					
No	107	79.9	84	84.0	0.418
Yes	27	20.1	16	16.0	
Alexithymia at follow up <sup>a,b</sup>					
No	107	81.1	92	92.9	0.010
Yes <sup>b</sup>	25	18.9	7	7.1	
	N	Mean (SD)	N	Mean (SD)	T-test, P
Alexithymia mean scores					
at the baseline (TAS)					
Total score <sup>b</sup>	132	50.4(12.1)	100	48.7(11.6)	0.305
DIF subscale score <sup>b</sup>	132	17.4(5.5)	100	17.1(6.1)	0.650
DDF subscale score <sup>b</sup>	132	13.1(4.6)	100	13.1(4.1)	0.279
EOT subscale score <sup>b</sup>	132	19.9(4.8)	100	19.3(4.7)	0.305
<b>at the follow up</b>					
Total score <sup>a,b</sup>	132	46.9(13.5)	99	44.0(11.6)	0.087
DIF subscale score <sup>a,b</sup>	132	15.3(6.7)	99	13.9(5.8)	0.097

DDF subscale score <sup>a,b</sup>	132	12.5(4.6)	99	11.4(4.1)	0.081
EOT subscale score <sup>a,b</sup>	132	19.4(4.6)	99	18.7(4.9)	0.448

**Table 3:** The prevalence and mean scores of alexithymia at the baseline and at the follow up of the study and the changes in alexithymia scores during the follow up time in intervention and control groups

<sup>a</sup>one missing case in the control group

<sup>b</sup>two missing cases in the intervention group

Variable	Intervention group (SD)	Control group (SD)	Unadjusted P-value <sup>c</sup>	Adjusted P-valued
Change in total TAS score <sup>a,b</sup>	-3.23(11.6)	-4.79(9.1)	0.269	0.140
Change in DIF TAS subscale score <sup>a,b</sup>	-2.1(5.9)	-3.1(4.9)	0.153	0.090
Change in DDF TAS subscale score <sup>a,b</sup>	-0.49(4.0)	-1.0(3.7)	0.297	0.190
Change in EOT TAS subscale score <sup>a,b</sup>	-0.67(4.4)	-0.65(3.8)	0.960	0.750

**Table 4:** Change between baseline and one year follow up of the TAS mean scores in the intervention and control groups

<sup>a</sup>one missing in the control group

<sup>b</sup>two missing in the intervention group

<sup>c</sup>independent samples T-test

<sup>d</sup>linear regression analysis adjusted for sex, social group and BDI score at the baseline

In a separate analysis, in subjects with alexithymia at the baseline, the decline in BDI scores between baseline and follow up was 10.59 (SD 10.9) in the intervention group and 7.71 (SD 14.2) in the control group. The difference in the decline of BDI scores between intervention and control groups was not statistically significant in crude analysis ( $p=0.474$ ) nor after adjusting for age, sex and social class ( $p=0.228$ ).

## Discussion

The main finding of this study was that the rehabilitation program EERIP among employed people with first ever diagnosed episode of depression did not have a decreasing effect on alexithymia in the intervention group as hypothesized. This finding was evident both in the analysis of primary (change in total TAS mean score) and secondary (change in prevalence of alexithymia) outcome measures. Instead, alexithymia was less common in the control group after one year of follow up time. The finding was opposite to our hypothesis. To the best of our knowledge, no earlier similar studies exist exploring the effectiveness of an eclectic rehabilitative intervention on alexithymia in working age persons experiencing first-episode depression.

Alexithymia is quite common among working age people. The prevalence has been shown to be about 9%–17% for men and 5%–10% for women [37-39]. The prevalence of alexithymia in our subjects was in line with these figures. This is surprising because all the subjects

were diagnosed with depression and the prevalence of alexithymia among depressive people has shown to be much higher than among general population [40,41].

Recovery from depression has shown to be associated with decrease in alexithymic features [4,40]. In the present study the BDI scores decreased in both intervention and control groups, while the TAS-20 total and the subscale scores did not change significantly. However, recovery from depression assessed with the change in BDI scores associated with change in total alexithymia scores in both groups. Hence, recovery from depression was associated with decrease in alexithymic features. The prevalence of alexithymia decreased more in the control group. An interesting question is why the subjects in the intervention group did not benefit from the intervention in the terms of alexithymia?

Sifneos, in his paper year 1975 [42], emphasized that careful evaluation is needed for the recommendations of psychotherapy in the presence of alexithymic features. Subsequent studies have shown that subjects with alexithymia may benefit from different therapies or interventions: multimodal cognitive behavioral therapy in Obsessive Compulsive Disorder [43], multimodal psychodynamic treatment [44,45], comprehensive integrated group therapy [46-49], intensive Short Term psychotherapy [50], mentalization based therapy [51], cognitive behavior therapy [52], Affect School-Intervention [53] among others. In the EERIP the group working methods were based on eclectic practice including both cognitive behavioral and psychodynamic principles. The EERIP gave the possibility for the subjects to obtain peer support and the opportunity to reduce individual stigma as well to better understand the features of depression and increase the insight of illness [19]. From this point of view, the EERIP would have been a tool in alleviating alexithymia too, but we could not show it. According to our hypothesis, the amount of alexithymia was expected to decrease when the depression alleviated, but this was not the case when the intervention and control groups were compared. In this study the subjects in the intervention group did not benefit from these methods in terms of alexithymia. This may be due to the relatively short intervention or the group-type method being too demanding for the subjects with alexithymia.

## Limitations

This study had several limitations. Of the subjects only 8% were males in the control group and 21% in the EERIP group, which may limit the generalizability of the results to both sexes. The small number of males is probably due to characteristics of the population from which the sample was drawn. In many of the occupational health care units involved in the study, most clients were working in social and health care and education professions in which most employees use to be females. Moreover, a high number of the drop outs in the control group were males. Nevertheless, there were no differences in the outcome measures between males and females.

One limitation may be that most of the drop outs were from the control group. In the EERIP group, there were more subjects belonging to the highest social group than in the lower social groups. A follow up period of one year may be too short to evaluate the long term effect of the rehabilitative intervention, especially in case of relative stable strait like alexithymia. More time would be needed to implement cognitive tools and to establish new behaviors [54]. The EERIP took 6 months and included 31 active days. The primary focus was the rehabilitation of depression, not of alexithymia. We had no detailed information of the resources and practices in the occupational health care units concerning the management of depression, and we did not know to what extent the good guide lines for the treatment of depression were being followed [35]. The use of a self-report inquiry, like BDI, may be not as reliable as using rating scales or standardized psychiatric interview techniques in evaluating severity of depression. However, the BDI is widely used in depression treatment studies [55]. The TAS-20, one of the most commonly used measures of alexithymia, is a self-report scale too.

## Strengths

The strengths of this study include the use of a control group in a randomized design. Due to the inclusion and exclusion criteria, the subjects represent working age people with first episode of depression who did not have notable treatment for depression or alexithymia previously. The group was suffering from depression without other mental disorders, such as substance abuse or psychotic disorders. The diagnoses were made by using an appropriate interview technique. The psychometric properties of the Finnish version of the TAS-20 have been shown to be satisfactory [29]. A notable factor in the intervention process was the multi professional working group; and the fact that the working group remained the same during the entire process from 2004–2009 ensuring quality and consistency in the intervention process. The eclectic intervention method itself is thus also strength. To our knowledge, comparative studies focusing on this kind of rehabilitative intervention among employed people have not been conducted previously.

## Conclusions

The early eclectic intervention program may represent a useful addition in the management of the complex and multifactorial syndrome of depression, improving the ability of occupational care units to help and treat employees presenting with first ever episode of depression. However, the intervention program had no decreasing effect on the amount of alexithymia after one year of follow up time in the intervention group in subjects with first episode of depression. Indeed, alexithymia alleviated in subjects in the control group with conventional treatment.

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# Enhancing sense of coherence via early intervention among depressed occupational health care clients

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Valtonen M, Raiskila T, Veijola J, Läksy K, Kauhanen M-L, Kiuttu J, Joukamaa M, Hintsa T, Tuulio-Henriksson A. Enhancing sense of coherence via early intervention among depressed occupational health care clients. *Nord J Psychiatry* 2015;Early Online:1–8.

*Background:* Research on interventions improving psychological adjustment has suggested that sense of coherence (SOC) could be improved. *Aims:* In the present study, we measured the impact of an intervention on the SOC among adults with first-episode depression. We also examined whether rehabilitation, depression, occupational stressors, life situation stressors and socio-demographic characteristics are associated with a change in the SOC.

*Methods:* Occupational health care clients were screened for depression using the Beck Depression Inventory (BDI) and a structured clinical interview (the The Structured Clinical Interview for DSM-IV: SCID-I). The participating subjects were randomized into a rehabilitation group ( $n = 134$ ) and control group ( $n = 100$ ) receiving treatment as usual. The Sense of Coherence Scale (SOC-13) was used at the baseline and in a 1-year follow-up to compare the change of the SOC between the groups. *Results:* The increase in the mean SOC score was statistically significant both in the rehabilitation group (54.91 compared with 62.85,  $P < 0.001$ ) and in the control group (55.29 compared with 61.64,  $P < 0.001$ ). There was no significant difference in the mean SOC scores between the groups at the follow-up. The improved SOC was associated with less severe depression ( $P = 0.003$ ) and greater decreasing in BDI ( $P = 0.041$ ) in the rehabilitation group. *Conclusions:* The results suggest that both rehabilitation and conventional depression treatment in a first episode of depression may enhance the SOC and that rehabilitation itself enhances the SOC more effectively among those with less severe depression or those whose BDI scores had further decreased at the 1-year follow-up.

• *Intervention, Rehabilitation, Sense of coherence.*

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Sense of coherence (SOC) is sociologist Aaron Antonovsky's concept describing the orientation of viewing one's environment as comprehensible, manageable and meaningful (1, 2). This concept is based on his salutogenic theory, claiming that the way people cope has an influence on their health. The SOC Scale was developed from interviews with people who had recovered from concentration camp experiences (2). Few studies examine changes in the SOC in an intervention setting. This could be explained by Antonovsky's assumption that the SOC, as measured using his SOC questionnaire (1, 2), is comparatively stable over time, at least after age 30. In contrast, clinical studies indicate that the SOC may change (3–6). Therefore, the SOC may represent a valuable tool for evaluating the outcome of interventions.

From this point of view, longitudinal research is needed to establish the variability of the SOC in a controlled intervention setting.

Antonovsky's theory (1, 2) assumes that effective coping is less likely for people with a low than a high SOC. This theory did not receive support in a study on the development of the SOC (7), in which an increasing trend was found in the SOC among individuals with a low SOC. To our knowledge, research is lacking on SOC-enhancing intervention studies for individuals with a low SOC, despite the fact that the SOC may be receptive to change in this particular group (3, 8).

The severity of depression is associated with the level of the SOC. In a study of depressed Turkish patients, the SOC was the strongest predictor of depressiveness among

age, gender, education, and marital and employment status (9). Mothers and fathers with depressive symptoms have a poorer SOC than others (10). In addition to depression, the SOC is also associated with other psychiatric disorders (11). Even though an association between the SOC and depression has been observed in some studies, SOC as a construct is not entirely explained by depression or any other trait (12, 13).

The SOC is considered a modifier of occupational stress (7), but the impact of work stressors on the SOC is not well known. In a study of Swedish rural men, a strong negative correlation was found between the SOC and job demands. A positive correlation with job control was demonstrated in a study in which the SOC was shown to be strongly correlated with work-related psychosocial factors and social support, but independent of socio-demographic factors, such as education and occupation (14).

Although only few intervention studies show changes in the SOC, interventions improving psychological adjustment could enhance the SOC. The stability of the SOC was studied in an intervention programme designed to boost re-employment, and the SOC improved significantly among those in the programme (15). Development of the SOC among employees working in public service occupations was investigated in three different group psychotherapy interventions (16). The change in the SOC between the three therapy groups and the control groups was significant, indicating that the SOC can be improved through a group intervention.

To our knowledge, no studies have been carried out in which a change in the SOC and its association with depressive symptoms, as well as occupational and life situation stressors are examined in a rehabilitation intervention targeted to employed patients with a first depressive episode. In the present study, we set out to measure the impact of an intervention on the SOC among adults with a depressive episode. We tested both the first hypothesis, that the SOC of depressed people attending an early intervention programme will be enhanced, and the second hypothesis, that the SOC of depressed people attending an early rehabilitation programme will be enhanced more than the SOC of the control group. We also studied whether changes occur in the prevalence of occupational and life situation stressors after the intervention. Moreover, we examined whether rehabilitation, depression, current occupational stressors, current life situation stressors and socio-demographic characteristics are associated with a change in the SOC.

## Material and methods

### Design

The present study is one part of a rehabilitation intervention study project, which aimed to measure the effectiveness of

early rehabilitation of depressive disorders among employed persons (18–64 years) in Finland. The study design and recruitment have been described in detail previously (17).

Our study was designed to measure the impact of an early intervention on the SOC among employed persons with depression in Finland. The participants of this study were selected from 18 occupational health care units in northern Finland between the years 2004 and 2009. The participants were given a detailed description of the study and provided written informed consent. The ethical committee of the Northern Ostrobothnia Hospital District, Oulu, Finland, approved the study in 2004.

### Participants

The participants were recruited from occupational health care units that provide services for about 120,840 clients on a yearly basis (17). All employees in Finland have occupational health coverage. The goal is to sustain and promote the health and working ability of employees. Occupational health professionals provide counselling about the health risks in the workplace and about how they can be prevented. The guidance is also given for further treatment or rehabilitation.

The participants were screened in the occupational health care units using the Finnish version of the 21-item Beck Depression Inventory (BDI) (18, 19) with a cut-off point of  $>9$ . For the current depressive episode, antidepressive drug use for less than 6 months and/or sick leave for less than 1 month were allowed. As presented in Fig. 1, a total of 355 subjects were approved for the study. Of these, 35 refused and 37 were excluded based on the exclusion criteria. The exclusion criteria were abuse disorders, schizophrenia group disorders, organic mental disorders or mental retardation. A total of 283 subjects were randomized into rehabilitation ( $n = 142$ ) and control groups ( $n = 141$ ). The inclusion criterion was a lifetime first episode of major depression. Eight of the subjects were excluded at the baseline, so the number of participants at the baseline was 275: 141 in the rehabilitation group and 134 in the control group. Subjects with depression who could not be treated in occupational health care services (psychotic symptoms or high suicide risk) or who required hospitalization were excluded ( $n = 1$  in the rehabilitation group and  $n = 7$  in the control group).

The final study group in the analysis phase thus comprised 234 subjects after dropouts ( $n = 7$  in the rehabilitation group and  $n = 34$  in the control group). Of these, 134 (106 women, 28 men) belonged to the rehabilitation group and 100 to the control group (92 women, eight men). The rehabilitation group participated in a two-phase rehabilitative intervention programme, and the control group received the regular treatment provided in occupational health care or primary health care. All participants completed the questionnaires at the baseline.

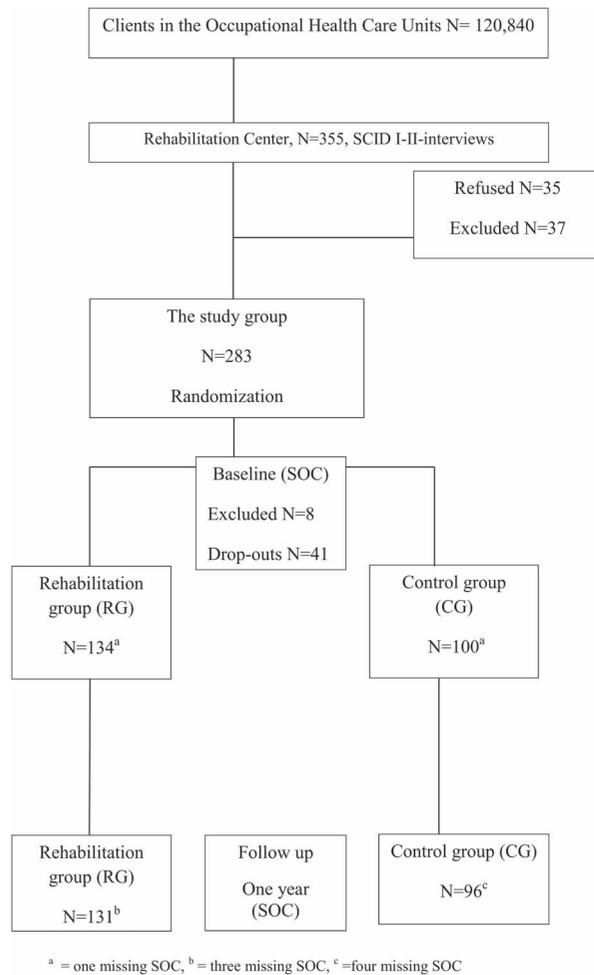


Fig. 1. Study procedure.

At the 1-year follow-up, 131 participants (104 women, 27 men) of the rehabilitation group and 96 (88 women, eight men) of the control group answered the questionnaires. The mean age ( $\pm$  standard deviation) for women was  $45.3 \pm 8.1$  years and for men  $44.6 \pm 10.0$  years ( $P = 0.639$ ).

### The rehabilitation programme

The rehabilitation programme was carried out by a multi-professional working group in the Oulu Deaconess Institute. The working group remained the same during the field study period of 2004–2009. The rehabilitation programme consisted of four courses, of which the first and the second were Research Courses and the third and fourth Rehabilitation Courses. The Research Courses focused on individual vulnerability factors of depression. The Rehabilitation Courses focused on coping with depression with group discussions and physical activities. The rehabilitation process took 6 months and included 31 active days.

The Research Courses were arranged for groups of three to five participants. The courses consisted of two 5-day periods at 3–4-week intervals. During the intervals,

participants worked on their individual tasks (20). The Rehabilitation Courses were scheduled 3–4 months after the Research Courses. They consisted of one 14-day long and one 7-day long course with a 3–4-week interval. The Rehabilitation courses were performed in groups of five to eight participants. These groups did not necessarily consist of the same individuals as in the Research Courses.

The aims of both the Research and Rehabilitation courses were to increase the self-knowledge of depressive symptoms, teach more effective coping with stressors, and provide peer and social support. The psychosocial group working methods were based on an eclectic practice including both cognitive behavioural and psychodynamic principles (20). A psychophysical physiotherapeutic approach to rehabilitation emphasizing the interaction between body and mind was adopted (21).

### Procedure

The participants completed questionnaires on basic socio-demographic information, the SOC-13, the BDI, and current occupational and life situation stressors at the beginning of the study and at the 1-year follow-up. The Structured Clinical Interview for DSM-IV (SCID I-II) (22, 23) was used as a diagnostic tool. Social class was defined on a nine-level Finnish classification based on the social appreciation of professions (24) and categorized into three groups: high, intermediate and low.

The SOC-13 questionnaire consists of four meaningfulness items, five comprehensibility items and four manageability items and is based on the original 29-item scale (25). The construct validity of the SOC-13 questionnaire has been found to be relatively good in previous studies (26, 27). Participants were asked to select a response on a 7-point semantic differential scale with two anchoring phrases. Using the answers on these scales, the sum score was calculated. The total possible score is 13–91, and higher scores indicate a stronger SOC. The Finnish version of the BDI was used (18, 19). BDI scores of 0–9 do not indicate depression, scores of 10–16 indicate mild depression, scores of 17–29 indicate moderate depression and scores of 30–63 indicate severe depression. In this study, the BDI was considered a classified variable at the baseline study and a sum in the linear regression analyses.

Life situation stressors were elicited with the question: “What are the stressors in your present life?” The options after the question were: 1) the alcohol abuse of a person close to me, 2) the mental disorder of a person close to me, 3) the illness of person close to me, 4) the death of person close to me, 5) the unemployment of a person close to me, 6) violence in the family, 7) relationship problems with my spouse, 8) the responsibility of taking care of a chronically ill person close to me, 9) problems with my children, 10) problems in my blended family, 11) school bullying, 12) custody problems and 13) other

stressor in my life at present. The answers given in these questions were either “yes” or “no”. The sum of the “yes” answers was counted, the minimum being 0 and the maximum 13. These questions were formulated for this research project, and the items were selected based on existing questionnaires surveying life situation stressors (e.g. 28).

Occupational stressors were asked with the question: “What are the occupational stressors in your present work?” The response options to choose from were: 1) mentally stressful work, 2) physically stressful work, 3) contentious relationships, 4) excessive workload, 5) difficult working conditions/difficult position at work, 6) unclear job description, 7) lack of influence, 8) lack of support/management problems, 9) the formal organization, 10) a lack of goals/lack of opportunity to advance and 11) other stressor. The answers given in these questions were either “yes” or “no”. The sum of the “yes” answers was counted, the minimum being 0 and the maximum 11. These questions were also formulated for this research project, and the items were selected based on existing questionnaires surveying work stress (e.g. 29).

### Statistical analysis

The mean SOC score from the first and second data collection were compared using a paired samples *t*-test. The differences in the mean SOC scores between groups were tested using an independent samples *t*-test, and the differences between the socio-demographic characteristics between groups were tested with Pearson’s chi-square test. Using data collected at the follow-up, the effects of the BDI, occupational stressors, life situation stressors and group status on the changes in the SOC score between the two data collections were investigated using linear regression models with the SOC follow-up total score as a dependent variable and adjusting for the baseline SOC score. The sum of the BDI, occupational stressors, life situation stressors and group status were included as predictors, both independently as well as in combination. The models were tested both unadjusted and adjusted for gender, basic education, vocational education and social class. A *P*-value of <0.05 was considered statistically significant. The analyses were done using SPSS Statistics Version 22.0.

### Results

As shown in Table 1, most of the participants were women. In the rehabilitation group, 20.9% and 8.0% in the control group were men (*P* = 0.007). Over half of the participants were 40–50 years of age in both groups. The proportion of the subjects in the highest social class in the rehabilitation group (18%) was higher compared with the control group (10%; *P* = 0.030). No statistically significant difference in the BDI was found in the classification of severity of depression in the baseline study.

Table 1. Socio-demographic characteristics and Beck Depression Inventory (BDI) of the participants at baseline.

Variable	RG		CG		All		Difference <i>P</i>
	<i>n</i>	%	<i>n</i>	%	<i>n</i>	%	
Gender							0.007
Male	28	20.9	8	8.0	36	15.4	
Female	106	79.1	92	92.0	198	84.6	
Age groups							0.781
< 40 years	33	24.6	21	21.0	54	23.1	
40–50 years	62	46.3	50	50.0	112	47.9	
> 50 years	39	29.1	29	29.0	68	29.1	
Basic education							0.893
High	53	39.6	37	37.0	90	38.5	
Medium	51	38.1	41	41.0	92	39.3	
Low	30	22.4	22	22.0	52	22.2	
Vocational education							0.059
High	30	22.4	20	20.0	50	21.4	
Medium	57	42.5	30	30.0	87	37.2	
Low	47	35.1	50	50.0	97	41.5	
Social class							0.030
Professional	24	17.9	10	10.0	34	14.5	
Intermediate	83	61.9	56	56.0	139	59.4	
Manual	27	20.1	34	34.0	61	26.1	
BDI*							0.073
No depression	0	0	0	0	0	0	
Mild	39	29.8	41	44.1	80	35.7	
Moderate	74	56.5	44	47.3	118	52.7	
Severe	18	13.7	8	8.6	26	11.6	

RG, rehabilitation group; CG, control group.

\*BDI, three missing data in RG, seven missing data in CG.

The increase in the mean SOC score was statistically significant both in the rehabilitation group (54.91 compared with 62.85, *P* < 0.001) and in the control group (55.29 compared with 61.64, *P* < 0.001). The two groups’ mean SOC scores did not differ statistically at the baseline. No significant difference was found in the mean SOC scores between the rehabilitation group and the control group in the follow-up 1 year later (62.85 compared with 61.64, *P* = 0.51). When studying the ≥10% change in the SOC score, this change was found in 53.1% of the subjects of the rehabilitation group and in 48.4% of the subjects of the control group. The difference in the changes (<−10%, ±10% and >+10%) between groups was not statistically significant (*P* = 0.49). A decrease ≥10% in the SOC score was found among 17.7% of the subjects of the rehabilitation group and in 9.5% of the subjects of the control group, but this change was not statistically significant between the groups (*P* = 0.081), (54.91 compared with 55.29, *P* = 0.82).

At the baseline, the main occupational stressors in both groups were the same three: mentally stressful work (rehabilitation group 76.1% and control group 69%), excessive workload (67.9% and 62%) and management problems/lack of support (53% and 55%) (Table 2). At the 1-year follow-up, the main three occupational

Table 2. Prevalence (%) of occupational stressors.

Occupational stressors	RG at the beginning	RG at 1-year follow-up	CG at the beginning	CG at 1-year follow-up
Mentally stressful work	76.1	56.7	69.0	56.6
Physically stressful work	23.9	21.6	39.0	34.3
Contentious relationships	49.3	35.1	46.0	32.3
Excessive workload	67.9	36.6	62.0	43.4
Difficult working conditions/difficult position at work	28.4	21.6	32.0	36.4
Unclear job description	32.1	20.9	39.0	24.2
Lack of influence	43.3	26.9	46.0	26.3
Lack of support/ management problems	53.0	37.3	55.0	38.4
Formal organization	29.9	22.4	39.0	32.3
Lack of goals/ lack of chance to advance	34.3	20.1	41.0	33.3
Other stressor	35.8	17.2	26.0	16.2

RG, rehabilitation group; CG, control group.

stressors had remained the same, and both groups showed changes in their occurrence (Table 2).

As presented in Table 3, the three most common life situation stressors at the baseline were other stressor in my life at present (rehabilitation group 40.3% and control group 42.0%), illness of a person close to me (35.8% and 36.0%) and relationship problems with spouse (33.6% and 34.0%). At the follow-up, more variation was seen between the groups.

To explore potential predictors of the change in the SOC (baseline to follow-up), a linear regression model was tested using the follow-up SOC as the dependent variable while adjusting for the SOC at the baseline. Rehabilitation as a group status, the BDI at follow-up, the change in the BDI, occupational stressors and life situation stressors were used as the other predictors. The interactions between group status (rehabilitation group vs. control group) and other predictors were investigated to see if rehabilitation modifies their effects on the

change in the SOC. As adjusters, gender, basic education, vocational education and social class were used. For the group status, additional analyses were also made using the BDI at the follow-up as an adjuster.

No significant association was found between the group status and the change in the SOC ( $P=0.452$ ; Table 4). Inspection of the other predictors showed that the BDI at the follow-up, the change in the BDI, occupational stressors and life situation stressors were related to the change in the SOC ( $P<0.001$ ) in both the rehabilitation and control groups.

However, rehabilitation had a modifying effect on the change in the SOC when interaction between the BDI at the follow-up and the group status was studied ( $P=0.003$ ). This result indicates that those in the rehabilitation group with a lower BDI at the 1-year follow-up had a stronger SOC than those in the control group. The same modifying effect was found when investigating the interaction between the change in the BDI and group

Table 3. Prevalence (%) of life situation stressors.

Life situation stressors	RG at the beginning	RG at 1-year follow-up	CG at the beginning	CG at 1-year follow-up
Alcohol abuse of close person	14.9	14.9	20.0	15.2
Mental disorder of close person	8.2	9.0	19.0	14.1
Illness of close person	35.8	14.9	36.0	21.2
Death of close person	19.4	10.4	22.0	12.1
Unemployment of close person	8.2	4.5	13.0	4.0
Violence in family	1.5	1.5	5.0	3.0
Relationship problems with spouse	33.6	23.1	34.0	17.2
Responsibility for taking care of chronically ill close person	10.4	8.2	8.0	11.1
Problems with children	16.4	9.0	17.0	12.1
Problems in blended family	6.0	2.2	7.0	5.1
School bullying	3.0	2.2	1.0	3.0
Custody problems	6.0	4.5	5.0	6.1
Other stressor in present life	40.3	17.9	42.0	29.3

RG, rehabilitation group; CG, control group.

**Table 4.** Effects of group status, Beck Depression Inventory (BDI), occupational and life situation stressors on the change in the sense of coherence (SOC).

	Unadjusted			Adjusted*		
	<i>B</i>	S.E.	Sig.	<i>B</i>	S.E.	Sig.
RG	1.42	1.58	0.368	1.25	1.66	0.452
RG, adjusted for BDI	1.50	1.14	0.187	1.37	1.20	0.254
BDI at follow-up	-0.97	0.07	<0.001	-0.97	0.07	<0.001
Change in BDI	-0.72	0.07	<0.001	-0.73	0.07	<0.001
Occupational stressors at follow-up	-1.05	0.28	<0.001	-1.09	0.29	<0.001
Life situation stressors at follow-up	-2.22	0.48	<0.001	-2.37	0.51	<0.001
Interactions†						
RG—BDI	-0.38	0.13	0.003	-0.39	0.13	0.003
RG—change in BDI	-0.29	0.14	0.035	-0.29	0.14	0.041
RG—occupational stressors	0.02	0.56	0.972	0.02	0.56	0.978
RG—life situation stressors	-1.18	0.98	0.232	-1.20	0.99	0.229

RG, rehabilitation group.

\*Model adjusted for gender, basic and vocational education, and social class.

†Difference in the slope for the corresponding variable in the rehabilitation group when compared with the control group.

status ( $P=0.041$ ), showing that the greater the decrease in the BDI, the stronger the SOC was at the 1-year follow-up.

## Conclusions

In the present study, the mean increase in the SOC score was statistically significant both in the rehabilitation group and the control group ( $P<0.001$ ), supporting the first hypothesis that the SOC will be enhanced in those receiving treatment for a first episode of depression. The rehabilitation group participated in a two-phase rehabilitation programme, and the controls received regular depression treatment in occupational health care or primary health care. Consistent with previous studies, the results of the present study indicate that the SOC is changeable during an intervention aiming at relieving symptoms of depression.

All subjects, both in the rehabilitation group and in the control group, suffered from clinical depression. Based on previous studies, the participants were expected to have a low SOC. In Eriksson & Lindström's (30) systematic review, the mean of SOC-13 ranged from 35.39 to 77.60 ( $\pm 13.80$ ) points in 127 studies. The groups in the present study fall in the middle.

The second hypothesis was not supported: the SOC of patients with depression attending a rehabilitation programme was not enhanced more than the SOC of the control group. No significant difference was found in the mean SOC scores between the rehabilitation group and the control group at the 1-year follow-up. An increase of  $\geq 10\%$  change in the SOC score was observed in 53.1% of the rehabilitation group and in 48.4% of the control group, thus showing a similar figure in both groups. The

difference in the decrease of the SOC score among 17.7% subjects of the rehabilitation group and 9.5% in the control group was not statistically significant.

A probable explanation for the non-significant results between the groups may lie in the fact that the participants in both the rehabilitation and control groups received treatment sufficient for their psychological adjustment. Although specific information about the treatment received in the control group was not collected, the treatment was probably adequate for depression. According to Raiskila et al. (17), the difference in the mean BDI score at the baseline between the groups was not statistically significant. The 18 occupational health care units involved in the study were informed about the rehabilitative intervention programme. This may indicate that treatment of the first episode of depression was given particular attention in the occupational health care units, especially for those who were screened but not selected for the rehabilitation programme.

Exploring whether the severity of depression and the presence of current occupational and life situation stressors were associated with the change in the SOC revealed some differences between the study groups. The lower the BDI or the greater the changes in the BDI score, the more the SOC had increased. Our study suggests that rehabilitation may help in enhancing the SOC more effectively among those with less severe depression or those whose BDI score decreased further during the 1-year follow-up.

A possible explanation for these outcomes could be in the slight differences in the severity of depression between the groups at the baseline. In the rehabilitation group, 29.8% had mild depression, while in the control group 44.1% belonged to this category. The proportion

of the subjects who had moderate or severe depression was higher in the rehabilitation group than in the control group. According to Raiskila et al. (17), the BDI score decreased by 10 or more points in 71% of the rehabilitation group and 52% of the control group, a difference that is statistically significant. These findings support the idea that although an association between depression and the SOC exists, the latter is not explained by depressive symptoms (12, 13).

In our study, occupational stressors were associated with the change in the SOC ( $P < 0.001$ ) in both groups. The strengthened SOC may be a modifier of occupational stress exposure, but this was not directly examined in the present study. In previous studies, a strong SOC has been found to serve as a buffer from stress almost independently of industrial managers' perceived stressors (31). Furthermore, the SOC may be an important factor determining the coping ability for job stress (32). Along with occupational stressors, life situation stressors, too, were related to the change in the SOC ( $P < 0.001$ ) in both study groups. A significant negative correlation between negative life events and the SOC has been noticed in earlier studies as well (5, 33).

One limitation of the present study is that the subjects represent a group of working-age persons who were treated for their first lifetime depressive episode. Therefore, the results rest on depressed adults, who were mostly women, and cannot be generalized to other groups. The small number of males is probably due to characteristics of the population from which the sample was drawn. The occupational health care units involved in this study represent mostly social and health care and education fields known to be predominantly female fields in Finland.

Another limitation is that specific information about the quality or intensity of the treatment that the control subjects were offered in the normal clinical setting was not collected, and we operated under the assumption that this treatment was adequate for depression and the enhancement of psychological adjustment.

Strengths of the present study include that no previous studies with a randomized design have investigated the impact of rehabilitation on the SOC among occupational health care clients with a first episode of depression. The depressive disorders were diagnosed using an appropriate diagnostic interview technique. The sample sizes can be considered large enough for an intervention study of this type. Additionally, the longitudinal study design allows the observation of a 1-year change in the SOC.

Considering the entire rehabilitation intervention study project aimed to measure the effectiveness of early rehabilitation of depressive disorders among employed persons, it is an important target of further studies to evaluate the cost effectiveness of rehabilitation.

## Acknowledgements

The study has been funded by the Social Insurance Institution of Finland. The authors thank Henri Salo for statistical support.

**Declaration of interest:** The authors report no conflicts of interest. The authors alone are responsible for the content and writing of the paper.

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