

Exploring the role of mindfulness in vocational rehabilitation

Solveig Vindholmen

**Exploring the role of mindfulness in
vocational rehabilitation**

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Table of contents

Acknowledgment	IV
English summary	VI
Norsk sammendrag	VIII
List of papers	X
List of abbreviations	XI
Definitions	XII
1 Introduction	1
1.1 Work disability	2
1.2 The Norwegian sickness insurance system	3
1.3 Vocational rehabilitation	4
2 The overall aim of the thesis	5
3 Theoretical and empirical background	5
3.1 Perspectives on health and functioning in the context of vocational rehabilitation	5
3.2 Predicting RTW after long-term sick leave	6
3.3 Effect of multidisciplinary interventions on RTW	8
3.4 Work ability	10
3.5 Mindfulness	11
3.5.1 What is mindfulness?	11
3.5.2 How does mindfulness work?	13
3.5.3 Different mindfulness-based approaches	14
3.5.4 Researching mindfulness	17
3.6 Description of the multidisciplinary vocational rehabilitation program	19
3.6.1 Mindfulness Based Stress Reduction	20
3.6.2 Vitality Training Program	20
3.6.3 Physical activity	21
3.6.4 Psychomotor physiotherapy	22
3.6.5 Individual counseling: Cognitive Behavior Therapy	23
3.6.6 Vocational focus	24

	3.7	The need for this study	24
	3.8	Research model.....	24
4		Specific aims of the thesis.....	25
5		Material and methods	26
	5.1	Study 1: a retrospective cohort study.....	26
		5.1.1 Design	26
		5.1.2 Study sample	26
		5.1.3 Procedure.....	26
	5.2	Study 2: a prospective cohort study	28
		5.2.1 Design	28
		5.2.2 Study sample	28
		5.2.3 Procedure.....	29
	5.3	The multidisciplinary vocational rehabilitation program	29
	5.4	Measurements	29
		5.4.1 Work ability	30
		5.4.2 Present work and benefit situation	30
		5.4.3 Mindfulness.....	31
		5.4.4 Quality of life.....	31
		5.4.5 Sense of mastery.....	32
		5.4.6 Global self-esteem	32
		5.4.7 Personal burnout.....	32
		5.4.8 Pain intensity/pain consequences	33
		5.4.9 Body Responsiveness	33
		5.4.10 Subjective Health Complaints	33
		5.4.11 Covariates.....	34
	5.5	Approaching mediation analysis	34
	5.6	Statistical analysis	36
6		Summary of results	37
	6.1	Study 1.....	37
		6.1.1 Paper I. Return to work after vocational rehabilitation: does mindfulness matter?	37
	6.2	Study 2.....	38
		6.2.1 Paper II. What distinguishes responders from nonresponders to a vocational rehabilitation program?	38

	6.2.2 Paper III. Does mindfulness affect participants' response to a vocational rehabilitation program?	39
7	Discussion.....	40
	7.1 Methodological aspects	40
	7.1.1 Study design	40
	7.1.2 Sample representativeness.....	42
	7.1.3 Measurements	43
	7.1.4 Statistical validity	50
	7.2 Discussion of research questions.....	52
	7.2.1 Study 1	54
	7.2.2 Study 2	56
	7.3 Concluding remarks and future directions	61
	7.3.1 Conclusions	61
	7.3.2 Practical implications	61
	7.3.3 Suggestions for future research.....	63
8	References.....	65

Published papers I-III

Appendixes

- Appendix I Information letter and declaration of consent (in Norwegian), study 1
- Appendix II Information letter and declaration of consent (in Norwegian), study 2
- Appendix III Questionnaires papers I-III
- Appendix IV Approval by the Norwegian National Committee for Medical and Health Research Ethics
- Appendix V Approval by the Norwegian Social Science Data Service (NSD)

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English summary

Background Vocational rehabilitation is increasingly used to facilitate a successful return to work (RTW) after long-term sick leave. Some vocational rehabilitation programs incorporate mindfulness training, suggesting that mindfulness is an effective tool for successful RTW. However, whether mindfulness enhances work ability (WA) and RTW rates has not yet been investigated.

Main aims To investigate whether mindfulness is a predictor of increased WA and successful RTW after a multidisciplinary vocational rehabilitation program (MVRP), and to explore the mediating influences of mindfulness in the relationship between personal health factors and WA.

Methods The project featured one retrospective cohort study and one prospective cohort study. The retrospective cohort study included 80 former participants (from 2008 to spring 2011) in the MVRP. Self-report measures were used to measure work status, WA, quality of life (QOL), and mindfulness. The prospective cohort study was conducted with 74 active participants in an MVRP in the period autumn 2011–autumn 2012. Self-report measures of functional health and psychological functioning were collected. In addition to a standard logistic regression analysis procedure, a bias-corrected bootstrapping technique was used to test the hypothesized indirect effects.

Main results Results from the retrospective cohort study suggested that mindfulness was indirectly related to RTW through QoL. The covariates WA and education level significantly predicted RTW. Furthermore, mindfulness significantly predicted successful RTW but only for the “high-educated” participants. Results from the prospective study suggest that the outcome of an MVRP is affected by pain intensity and sense of mastery at baseline. High pain intensity and low sense of mastery significantly predicted an unsuccessful WA response to the MVRP. Furthermore, the results revealed that enhancement of mindfulness during the course of the program significantly predicted a successful WA response. In addition, decreased personal burnout and enhanced self-esteem were both unique predictors of a positive WA response. Mediation analysis showed that mindfulness mediated the effects of personal burnout and self-esteem on the participants’ WA response.

Conclusion The data in the retrospective cohort study demonstrate that mindfulness may be a useful tool applied in the context of vocational rehabilitation, suggesting

that mindfulness may enhance RTW and WA via QOL. Furthermore, for “high-educated” participants, mindfulness independently predicts RTW. We conclude that enhancement of education and qualifications for the labor market should be the highest priority for “low-educated” people on long-term sick leave. Data from the prospective cohort study indicate that enhancing the skills of mindfulness may be useful when aiming to increase WA. However, not all individuals respond positively to the MVRP in terms of improved WA. In particular, unfavorable WA responses were detected in participants who reported high pain intensity and a low sense of mastery at baseline. We conclude that it still is a challenge to understand the factors that distinguish responders to MVRPs from nonresponders, and thus, further research is required.

Norsk sammendrag

Bakgrunn Arbeidsrettede rehabiliteringstiltak er i økende grad brukt metodisk for å få langtidssykemeldte individer raskere tilbake til arbeid. Noen arbeidsrettede rehabiliterings intervensjoner benytter mindfulness-trening, og med det forslår en mindfulness som en adekvat metode for å få individer raskere tilbake til arbeid. Hvorvidt mindfulness øker arbeidsevne eller får individer raskere tilbake til arbeid er ennå ikke blitt undersøkt.

Formål Undersøke om mindfulness er en prediktor for økt arbeidsevne og raskere tilbakeføring til arbeid etter et multidisiplinært arbeidsrettet rehabiliteringsprogram, samt undersøke de medierende effekter til mindfulness i forholdet mellom personlige helsefaktorer og arbeidsevne.

Metode Prosjektet omfatter en retrospektiv kohort studie og en prospektiv kohort studie. Den retrospektive studien ble gjennomført blant 80 tidligere deltakere (deltakende i tidsperioden 2008 – våren 2011) på det arbeidsrettede rehabiliteringskurset. Selv-rapporterende spørreskjema ble benyttet for å måle arbeidsdeltakelse, arbeidsevne, livskvalitet og mindfulness. Den prospektive kohort studien ble gjennomført blant 74 deltakere i det arbeidsrettede rehabiliteringskurset i tidsperioden høst 2011 – vår 2012. Selv-rapporterende spørreskjema som målte fysisk og psykisk helse ble innsamlet. I tillegg til logistisk regresjonsanalyse, ble også en feilkorrigert bootstrapping teknikk benyttet til å undersøke hypotesene om indirekte effekter.

Resultater Resultatene fra den retrospektive kohort studien foreslår at mindfulness er indirekte relatert til “tilbake i arbeid”, gjennom livskvalitet. Kovariatene, arbeidsevne og utdanningsnivå, predikerte “tilbake i arbeid”. For deltakere med “høy utdanning” predikerte mindfulness “tilbake i arbeid”. Resultatene fra den prospektive kohort studien foreslår at utfallet av det arbeidsrettede rehabiliteringskurset er påvirket av variablene “opplevd smerteintensitet” og “generell opplevelse av kontroll” ved kursstart. Høyere opplevd smerteintensitet og lavere opplevelse av generell kontroll ved kursstart predikerte et negativt rehabiliteringsutfall målt i arbeidsevne. Videre indikerte resultatene at økt mindfulness-nivå i løpet av intervensjonen, predikerte en økning i arbeidsevne. Også redusert personlig burnout samt økt selvfølelse predikerte økt arbeidsevne. Mediasjonsanalyser foreslår at økt

mindfulness medierte effekten av redusert personlig burnout og økt selvfølelse på deltakernes arbeidsevne.

Konklusjon Resultatene i den retrospektive kohort studien indikerer at mindfulness kan være et nyttig redskap brukt i arbeidsrehabiliterings-sammenheng, ved å foreslå at mindfulness øker “tilbake i arbeid” gjennom økt livskvalitet. Videre at mindfulness predikerer “tilbake i arbeid” for de “høyt utdannede” deltakerne. Basert på resultatene konkluderer studien med at styrking av utdannelsesnivå og kvalifisering for arbeidsmarkedet bør vektlegges for “lavt utdannede” individer som er langtidssykemeldte. Resultatene fra den prospektive kohort studien indikerer at økning i mindfulness-ferdigheter kan være hensiktsmessig når målet er å øke arbeidsevne. Imidlertid var det ikke alle deltakerne som økte arbeidsevne i løpet av det arbeidsrettede rehabiliteringskurset. Spesielt var det deltakere som scoret høyt på selvopplevd smerteintensitet og generell opplevd kontroll ved kursstart som fikk et uønsket rehabiliteringsutfall målt i arbeidsevne. Studien konkluderer med at det fremdeles er en utfordring å forstå hva som skiller de som responderer positivt fra de som ikke responderer på arbeidsrettede rehabiliteringstiltak, og derfor, at videre forskning er påkrevd.

List of papers

This thesis consists of three papers, which will be referred to in the text by their Roman numerals.

- I. Vindholmen S, Høigaard R, Espnes GA, Seiler S. Return to work after vocational rehabilitation: does mindfulness matter? *Psychol Res Behav Manag.* 2014; 7: 77–88. doi: 10.2147/PRBM.S56013
- II. Vindholmen S, Haugen T, Høigaard R, Seiler S. What distinguishes responders from nonresponders to a vocational rehabilitation program? *Health Psychol Behav Med.* 2015; 3(1): 263–280. doi: 10.1080/21642850.2015.1088388
- III. Vindholmen S, Høigaard R, Haugen T, Seiler S. Does mindfulness affect participants' response to a vocational rehabilitation program? *Health Psychol Behav Res.* 2016; 4(1): 91–113. doi: 10.1080/21642850.2016.1179120

List of abbreviations

CBT	Cognitive Behavior Training
ES	Effect Size
FFMQ	Five-Facet Mindfulness Questionnaire
MBSR	Mindful-Based Stress Reduction Program
MVRP	Multidisciplinary Vocational Rehabilitation Program
NAV	Norwegian Labor and Welfare Administration
NPMP	Norwegian Psychomotor Physiotherapy
OECD	Organization for Economic Cooperation and Development
PA	Physical Activity
RTW	Return to Work
VTP	Vitality Training Program
WA	Work Ability
WAI	Work Ability Index
WAS	Work Ability Score
QOL	Quality of Life

Definitions

High education in this thesis is defined as university or university college level.

Long-term sick leave in this thesis refers to sick leave lasting for more than 8 weeks [1].

Low education in the present thesis is defined as high school or lower.

Mindfulness is defined as “paying attention on purpose, in the present moment, nonjudgmentally” [2].

Pain intensity is defined as the current personally experienced level of pain intensity ranging from “no pain” to “pain as bad as you can imagine” [3].

Prediction is defined as “in general, prediction is the process of determining the magnitude of statistical variates at some future point of time. In statistical contexts the word may also occur in slightly different meanings; e.g. in a regression equation expressing a dependent variate y in terms of dependent x 's, the value given for y by specified values of x 's is called the “predicted” value even when no temporal element is involved” [4].

Return to work (RTW) refers to the process of ending the sickness absence by going back to work [5].

Sense of mastery or perceived control refers to an individual's generalized expectancies or beliefs about the extent to which they regard their life chances and things that happen to them as being under their own control rather than being fatalistically determined [6, 7].

Sick leave or sickness absence refers to absence from work caused by work disability [1].

Vocational rehabilitation refers to a multiprofessional approach that is provided to individuals of working age with health-related impairments, limitations, or restrictions in work functioning, which has the primary aim of optimizing work participation [8].

Work ability refers to the match between the physical, mental, social, environmental, and organizational demands of a person's work and his or her capacity to meet these demands [9].

Work assessment allowance. In Norway, if a person is still suffering from reduced functional ability because of disease or injury after the period of sickness benefits ends, the individual can apply for, and may be granted, a work assessment allowance for a period up to 4 years. This benefit usually equals two-thirds of the individuals' previous income [10].

Work disability is defined as "when a worker is unable to stay at work or RTW because of an injury or disease" [11].

1 Introduction

The people studied throughout this project are individuals on long-term sick leave who were undergoing vocational rehabilitation. We have investigated how their baseline characteristics might have influenced the process and outcome of rehabilitation, how the intervention impacted on their own perception of their work ability (WA), and whether return to work (RTW) was achieved. In Norway, mindfulness is used in vocational rehabilitation as one method to treat individuals on sick leave, although the empirical evidence for the utility of mindfulness for enhancing WA and RTW is lacking. Therefore, mindfulness training and its usability in the context of vocational rehabilitation is a focus of the present thesis.

It is a prominent political goal in Norway to enhance our knowledge of the conditions that influence the outcome and process for individuals referred to vocational rehabilitation, and to increase the use of vocational rehabilitation measures [12-16]. The multifaceted nature of the factors and the mechanisms associated with the process and the outcome of vocational rehabilitation has been demonstrated in a large body of research [17-19]. Unfortunately, the phenomenon that some individuals are able to RTW after vocational rehabilitation while others are not is insufficiently understood. Consequently, more knowledge is needed about the characteristics of individuals who are most likely to benefit from vocational rehabilitation, to improve the selection of those eligible individuals who are most likely to benefit from such interventions. It is also of critical importance to identify risk factors for unsuccessful rehabilitation to ensure the provision of appropriate assistance in the vocational rehabilitation process for the nonresponders to such interventions.

In the present project, experiences from a multidisciplinary vocational rehabilitation program (MVRP) in southern Norway have been the focus of investigation. The MVRP is delivered by a vocational rehabilitation enterprise and is commissioned and financed by the local Norwegian Labor and Welfare Administration (NAV) in Aust-Agder. The MVRP studied here is a day-based group counseling program that includes mindfulness, physical activity (PA), psychomotor physiotherapy, a vitality training program (VTP), and individual counseling. The MVRP is offered to individuals on long-term sick leave and to other users of the NAV (e.g., people receiving a work assessment allowance) who report poor WA; i.e., WA

reduced by at least 50%. The MVRP combines health-related rehabilitation with a focus on work-related factors. It aims to enhance the individual's ability to overcome health-related and/or social problems that hinder their work participation. The main goal of the MVRP is to enhance the individual's ability to perform income-producing work [20]. Previous qualitative research on this particular MVRP indicated that the participants experienced increased quality of life (QOL) both directly after the intervention [21] and at follow-up 1 year later [22].

1.1 Work disability

In our modern society, work is central in peoples' lives as an important adult activity, a source of identity, and one of the most powerful determinants of health and well-being, especially when it is performed under good working conditions [23, 24]. Work provides income and a number of nonfinancial benefits to individuals and their families, and provides societies with productive values [25]. The general positive effect of work for adults is evident in a number of outcomes including improved physical health, psychological well-being, and life expectancy [23, 24].

In the light of work's critical importance, the negative consequences of a lack of ability to work become clear. Disability is part of the human condition and is an extensive global issue. Worldwide, over one billion people, or approximately 15% of the world's working age population, are living with some sort of disability [26]. Work disability is today viewed as a public health issue, and the consequences of work disability are viewed not only as having biomedical causality but also as depending on psychological and social factors (i.e., a biopsychosocial approach to health and rehabilitation) [27]. In the context of vocational rehabilitation, work disability is defined as "when a worker is unable to stay at work or RTW because of an injury or disease" (p. ix) [11].

One possible consequence of work disability may be long-term sick leave. Sick leave is increasing in all industrial countries and currently represents a serious cost and burden for individuals, workplaces, and society [28, 29]. In Norway, as in other industrialized countries, musculoskeletal disorders and mild-to-moderate mental illness cause the majority of all sick leave [28, 30-32]. Those on long-term sick leave are a heterogeneous group, and the diagnostic basis for conditions resulting in sick leave is often very vague, with few or no objective medical explanations [33-36].

Within vocational rehabilitation research, there is general agreement that work disability must be understood as a dynamic relational concept involving individual, organizational, and societal factors [37]. Furthermore, WA and disability are considered to be facets of the same phenomenon [37].

1.2 The Norwegian sickness insurance system

When a person becomes work disabled in Norway because of disease, injury, or illness, he or she is entitled to sickness benefits based on a sickness certificate usually issued by a medical doctor. To have the right to receive sickness benefits from NAV, individuals must have stayed at work for 4 weeks or more. The Norwegian benefit system confers the right of individuals when they are sick to receive a regular salary of 100% of wages from the first day of absence for a maximum of 52 weeks. Employers cover the wage loss for the first 16 calendar days of sick leave, while the NAV pays cash benefits for the rest of the period. After the period of sickness benefits, if the individual is still suffering from reduced functional ability because of disease or injury, he or she may be granted a work assessment allowance for a period of up to 4 years or may eventually be granted a disability pension if medical or vocational rehabilitation efforts do not have the intended effect. These benefits usually equal two-thirds of the individuals' previous income [10]. Graded benefits combined with part-time work are actively recommended by the authorities and are common in the Norwegian setting. The employer has the main responsibility for the follow-up of individuals on sick leave, while formal roles are played by the medical doctor who grants the sickness certificate and the NAV. The employee is required to collaborate with, and to contribute to, the RTW process to achieve RTW as soon as possible [10, 38].

The proportion of working-age adults receiving sickness benefits is high in Norway compared with other countries [32, 39]. Aakvik et al. [40] claim that this high proportion may partly be explained by three institutional factors. First, Norway has generous sickness benefits. Second, the cost to employers of having workers on sick leave is low. Third, the social insurance institutions seldom evaluate or scrutinize the general practitioners' medical assessments [40]. The NAV's sickness benefit bill for 2013 was about 35 billion NOK. In the same period, the NAV used 226 million NOK on measures intended to achieve faster RTW [41]. Work disability in Norway is estimated at over 500,000 full-time employee equivalents [42]. According to the

OECD [32], Norway has the most generous benefit system in the OECD area, with a high proportion of financial coverage over a long duration. Public and mandatory private expenditure on disability and sickness benefits amount to approximately 5% of GDP. Almost one-fifth of the Norwegian population receive income support because of health problems or disability—nearly everybody who is not working. Brage and Hernes [43] state that several publications from the OECD claim that people in Norway are excluded from the labor market by their certification as either sick or disabled, because this welfare-driven strategy and generous social protection system has the contrary effect of increasing inequality and exclusion for some individuals [32]. One recommendation given to Norway by the OECD is to strengthen the effectiveness of vocational rehabilitation measures (e.g., to develop rehabilitative program packages for relevant target groups) [32].

1.3 Vocational rehabilitation

One key component of work disability is vocational rehabilitation, which is defined as “a multiprofessional approach that is provided to individuals of working age with health-related impairments, limitations, or restrictions in work functioning, which has the primary aim of optimizing work participation” [8].

Vocational rehabilitation aims to target the heterogeneous group of individuals who are on long-term sick leave. Norway has a strong vocational integration focus, with a range of vocational rehabilitation measures that can be applied at any time and over several years [32]. Vocational rehabilitation measures are financed by the NAV with the main goal of reducing sick leave and increasing the rate of successful RTW [12, 15, 16].

Some of the measures applied are oriented toward the employer (e.g., attitude campaigns and supported employment). Other measures are oriented toward individuals (e.g., measures aimed at strengthening them by helping them to increase their qualifications or through work-preparation training). The emphasis on the last-mentioned approach is strong, and it represents the majority of Norwegian vocational measures [44].

The high personal and societal costs of work disability and long-term sick leave make it crucial to minimize their magnitude and duration. Despite the large financial investment in various measures initiated to reduce sick leave in Norway, few studies

have examined whether these measures contribute to enhanced WA and RTW for participants [41].

2 The overall aim of the thesis

The overall aim of the present project was to investigate the experiences in an MVRP at a vocational rehabilitation enterprise in south Norway. Because mindfulness is a central element in the MVRP [20], the project particularly emphasized the role of mindfulness training in the context of vocational rehabilitation. The main aims were to investigate whether mindfulness predicted RTW and WA after participation in the MVRP, and to investigate the potential mediating effects of mindfulness in the relationship between personal health factors and WA. The project also aimed to identify possible predictors for successful/unsuccessful WA responses to the MVRP.

3 Theoretical and empirical background

3.1 Perspectives on health and functioning in the context of vocational rehabilitation

Since the 1970s, many rehabilitation scholars have advocated a more ecological and multifactorial paradigm of disability, focusing on disability as an individualized experience taking place in a certain environment, as well as disability as a social phenomenon. The models or conceptual frameworks used to understand the development of work disability and RTW have evolved from biomedical, psychosocial, and forensic models, to comprehensive biopsychosocial models, where individual and psychosocial factors are integrated into a system-based approach [45]. Engel's [46] biopsychosocial model views health and illness as the product of a combination of factors, and accounts for interconnected biological (e.g., health condition, genetic predispositions, chemical imbalances), psychological/behavioral (e.g., lifestyle, stress, health beliefs), and sociological (e.g., cultural influences, family relationships, social support) factors [47, 48]. The biopsychosocial perspective is used in this thesis because this perspective may provide a broader and more accurate understanding of factors associated with WA and participation in work than a traditional biomedical model [49]. Because work disability is the result of complex interactions between the individual, his or her health/illness state, and the environment (political, social,

cultural, and physical), it is essential to understand the dynamic disablement/enablement process in an integrative form, relating it not only to the individuals' functionalities but also to the inherent context [48]. The biopsychosocial approach is currently judged to be the model that best explains the disability/RTW continuum by emphasizing the multidimensional nature of work disability in an attempt to understand the individual and the systems involved, and their interactions [48].

In this thesis, the biopsychosocial perspective is applied to both the MVRP investigated and the design of the study, and in the interpretation of the results. However, it is beyond the scope of this thesis to present a comprehensive analysis of the contextual factors and systems involved, and the emphasis is on the individual factors/personal system.

3.2 Predicting RTW after long-term sick leave

RTW is a complex, multifactorial phenomenon, which not only is related to biomedical health factors but also is influenced by individual, social, economic, and work-related factors [11]. A wide range of factors are recognized as important in the RTW process, but psychosocial, work-related, sociodemographic, and medical factors are the dominant prognostic factors for long-term sick leave and RTW [18, 49-52].

Previous studies have identified *biological/medical factors* associated with RTW. The most frequent diagnoses for long-term sick leave in Norway, and in other European countries, are mild-to-moderate mental illness and musculoskeletal disorders [28, 30-32, 53]. However, there is disagreement in the literature regarding whether the diagnosis affects the chances for successful RTW after long-term sick leave, and different diagnoses seem to influence the prognosis of men and women in different ways [18, 36, 54, 55]. Self-reported mental and physical health may be more useful than diagnosis and objective measures to explain RTW [56, 57]. In addition, comorbidity, or reporting more health problems, is identified as a risk factor for unsuccessful RTW [33, 35, 49, 58]. Previous studies have also identified higher levels of pain, pain-related disability, and difficulties in managing pain as major risk factors for unsuccessful RTW [50, 52, 59]. Furthermore, the severity and duration of mental health problems is found to predict RTW [50, 60, 61]. Biological/medical factors that facilitate RTW after vocational rehabilitation for people suffering from musculoskeletal disorders are good general health and lower functional disability,

improvement in functional capabilities and health status, physically active, less pain, less severe disease or injury, fitness on exercise, and increased physical functioning [50, 52]. In people with common mental disorders, biological obstacles to RTW might be exhaustion, reduced concentration, and forgetfulness [62].

Previous studies have also identified *sociodemographic factors* associated with RTW, and several studies have investigated whether sex is a predictor of RTW. Contradictory results are found between studies [52]. Most studies conclude that men have a greater likelihood of successful RTW [51, 63] and that being female predicts an unsuccessful RTW [18, 51, 64]. However, some studies report that women were more likely to RTW [50], and some studies report no difference between the sexes [65]. Age is considered likely to affect RTW. Younger age was reported as a positive predictor for successful RTW [50, 51, 66], while greater age predicts failure to RTW [18, 50, 51, 59, 67]. But there are also studies indicating that age is a non-significant factor [50, 68]. Furthermore, research has shown that lower level of education do not facilitate RTW [50], and that people with less education need more time to RTW fully [69, 70]. Socioeconomic status (i.e., education, type of job, and income) is a significant predictor for RTW [60, 70, 71]. The duration of sick leave before participating in vocational rehabilitation may influence the outcome, and individuals with shorter sick leave had increased probability of successful RTW [51, 66, 72].

Several *physical and psychosocial workplace factors* have been shown to affect RTW. Important workplace factors are physical job demands, psychosocial job demands, work organization support, and workplace beliefs and attitudes [73]. In all, most consistent evidence is found for variables measuring self-reported physical demands, job stress and control, social support, ability to modify work (accommodation and modified duties), the employer organizations' safety and wellness culture, and workplace accessibility [73].

Individual-level psychosocial factors influence a worker psychologically or socially and may operate as barriers or facilitators to individuals' rehabilitation and RTW [74]. Important individual-level psychosocial factors to consider in vocational rehabilitation and RTW are attitudes and beliefs (e.g., recovery expectations, self-efficacy), behavior (e.g., fear avoidance beliefs, coping), emotional responses (e.g., distress), and perceived social support [74]. Recovery expectations were shown to predict RTW in workers with musculoskeletal conditions [68, 75-77], and mental

health conditions [71]. Positive expectancy of RTW, and improvement in perceptions of self-efficacy regarding work, facilitated RTW in workers with musculoskeletal disorders [50]. A study by Kvam et al. [78] explored the importance of values in the RTW process and concluded that other important goals (i.e., the individual's family life and/or leisure-time activities) may overshadow and downgrade the goal of returning to work when chronic pain has led to reduced functional capacity. Furthermore, a review by Iles et al. [77] reported moderate evidence that fear avoidance beliefs are predictive of RTW in workers with non-specific low back pain, whereas the review by Laisne et al. [75] reported inconclusive evidence for fear avoidance and RTW in individuals with musculoskeletal disorders. Furthermore, strong evidence was shown for an association between coping and work disability outcome, but no association with RTW [75]. In the literature, coping has also been represented by other terms, such as perceived control, mastery and self-esteem [79]. Previous research on predictors of successful rehabilitation has found that participants with an external locus of control have a less favorable point of departure at the start of the vocational rehabilitation, whereas an internal locus of control seems to predict a more favorable outcome of vocational rehabilitation [67, 80]. Low self-esteem is among factors hindering RTW [50]. In summary, the most consistent evidence, across diagnosis, is for individual-level psychosocial factors reflecting recovery expectations and coping. The impact of psychosocial factors on RTW outcome may differ over time, and between health conditions [74].

Studies on RTW have mainly focused on negative health symptoms and risk factors for unsuccessful RTW. However, over the last decade there has been growing interest in factors that may facilitate RTW [50].

3.3 Effect of multidisciplinary interventions on RTW

Multidisciplinary interventions usually consist of an extensive combination of physical, vocational, and behavioral components, plus the modification of medication use. Such programs commonly involve attendance for a considerable number of hours per week [81]. Several systematic reviews of randomized controlled trials (RCTs) with RTW as the outcome measure report that extensive multidisciplinary interventions are more efficacious and cost-effective in increasing RTW than single-modality interventions, independent of the participants' diagnoses [28, 82-84]. The majority of these studies examined musculoskeletal conditions, while research on

other significant causes of long-term sick leave such as mild-to-moderate mental illness appear to have a general lack of focus on vocational rehabilitation and work outcomes [83, 84]. In some studies of individuals with musculoskeletal pain [85, 86], individuals with a poor prognosis for RTW benefited most from extensive multidisciplinary treatment, while individuals with a good prognosis for RTW did equally well with ordinary treatment or more intensive treatment. Furthermore, previous research [87] has demonstrated that extensive multidisciplinary interventions are a cost-effective method for enhancing health and increasing RTW in women, but not in men. Skouen et al. [88] found that most men need a light MVRP rather than an extensive MVRP, and that light, but not extensive MVRP, is cost-effective treatment versus treatment as usual in men. A randomized clinical trial comparing a brief intervention and a more comprehensive MVRP in workers with low back pain, found no difference between the two interventions in RTW, pain, disability, or self-rated health [89], and the authors suggest subgroup analyses (see for example Steenstra et al. [90]) to obtain more knowledge about the different benefits of various types of interventions [89]. However, a systematic review of RCTs with RTW as the effect measure demonstrated that there is still a lack of knowledge about which interventions benefit whom, and whether their duration and intensity are of any importance [91]. There are fewer studies and very limited evidence regarding whether vocational rehabilitation interventions improve RTW in individuals with mental illness [84, 91], and there is no high-quality evidence about the cost-effectiveness of interventions to improve work outcomes for this group of individuals [91]. Though systematic reviews of the literature in the area of work participation and work function for individuals with a mental condition [92-95] have provided relevant information, there is little information available about the RTW process [96].

Perfect timing of actions and interventions in the RTW process is important in order to obtain a timely and safe RTW [97]. RTW stakeholders often give incorrect advice and thereby hinder RTW [53, 98]. In addition, implementing evidence in the context of work disability and RTW is challenging, because many barriers occur, recommendations for RTW are often inaccurate and not yet practical for immediate application, and many stakeholders are involved [99]. Several researchers [91, 100] have argued that it is very challenging to target vocational rehabilitation interventions individually.

3.4 Work ability

Some researchers propose a shift in focus from the prevention and management of work disability to the promotion and preservation of WA. The concept of WA originated in the Scandinavian countries in the 1990s and is most often viewed as a dynamic and multidimensional phenomenon that also takes into account the role of the context [101, 102]. WA has been defined as the “match between the physical, mental, social, environmental and organizational demands of a person’s work and his or her capacity to meet those demands” (p.1173) [9]. Although there is no universally accepted definition of the basic requirements for WA, there is a general understanding in the research literature that the concept of WA must be understood as a dynamic relational concept between individual, organizational, and societal factors [37]. Lederer et al. [37] reviewed the literature on the concept of work (dis)ability and identified some key dimensions: 1) individual (i.e., the physical dimension, the mental/emotional/behavioral dimension, the social dimension, the demographic dimension, the financial dimension, the educational/vocational dimension, and the cultural/symbolic dimension), 2) organizational (i.e., the physical dimension of work, the mental/emotional/behavioral dimension of work, the social dimension of work, the financial dimension of work, the structural dimension of work, and the organizational culture and climate dimensions of work), and 3) societal (i.e., sociodemographic, cultural, politico-legal, and macroeconomic dimensions). The recognition that work (dis)ability is multidimensional and results not only from an individual’s condition (medical or not) but also from organizational and societal conditions has important implications for work (dis)ability promotion, rehabilitation, and management, and for developing innovative ways to address the full spectrum of conditions that positively or negatively affect work retention and RTW [37].

Previous studies have indicated that poor WA is related to increased sick leave [103], early retirement [104], and reduced productivity at work [105]. In contrast, a positive perception of WA has predicted a shorter duration of sick leave, later retirement, and a high rate of RTW [106, 107]. Some factors influencing WA and RTW are unchangeable, such as age and gender. Although these factors are useful in predicting RTW outcome and determine individuals at risk, only modifiable factors can provide a sound basis for interventions. It seems wise in vocational rehabilitation to focus on factors that can be improved [50, 71]. Increased knowledge about

modifiable factors hindering or facilitating WA and RTW may improve vocational rehabilitation outcome and RTW rates.

3.5 Mindfulness

Some vocational rehabilitation programs give considerable attention to mindfulness training, thereby suggesting that mindfulness could be a potentially valuable tool in the RTW process. This section will clarify the concept of mindfulness, how it is supposed to work, and previous research on mindfulness.

*“Compared to what we ought to be, we are only half awake.”
W. James (p. 237) [108].*

3.5.1 What is mindfulness?

The concept of mindfulness has its origin in ancient Buddhist practice [109, 110]. Mindfulness was introduced to Western medicine in the 1970s and has today become an acknowledged method of health promotion in Western cultures to reduce stress, to manage emotion, and to cope with illness and pain [2]. One acknowledged definition of mindfulness is “paying attention on purpose in the present moment and nonjudgementally” [2]. Mindfulness can be described as a state of consciousness including both attention and awareness [109]. Awareness can be depicted as the background radar of consciousness that constantly monitors the inner and outer environment. Individuals may be aware of stimuli without placing them at the center of attention. As such, awareness and attention are intertwined in a manner where attention always chooses the center of focus from the field of awareness, holding the object, sensation, or thought focally for varying lengths of time. Although attention and awareness are relatively constant aspects of normal functioning, mindfulness can be considered to be an improved attention to, and awareness of, present experience or current reality [111]. Stevens [112] refers to three zones of awareness: 1) awareness of the inside world—actually sensory contact with inner events in the present—i.e., what individuals are aware of inside their skin; 2) awareness of the outside world—actual sensory contact with objects and events in the present; and 3) awareness of imaginary activity, which includes all activity beyond present awareness and ongoing experience. Attention is a process of focusing conscious awareness, providing heightened sensitivity to a limited range of experiences [113].

One possible advantage of being mindful is that when people are mindful, they are more capable of acting in ways that are selective, and they are more openly attentive to, and aware of, themselves and the situations in which they find themselves [114, 115]. In fact, openness to experiencing what “is” in the present moment, without defending against it, facilitates integrated functioning and aids the ability to act congruently with respect to one’s perceptions, goals, and values [116]. Cultivating mindfulness by entering the state of mind defined above has been referred to as entering a “being mode” consisting of present-focused awareness, with a “doing mode” as its opposite because it entails goal-oriented tasks [117].

However, Ryan and Deci [118] argue that most people, most of the time, are not aware of what is happening in the present moment and are not acting autonomously or mindfully. This happens because peoples’ tendency to escape from responsibility and its consequences, as well as their active awareness is usually constricted by seductive and bewildering influences. Furthermore, when their awareness of inner and outer events is diminished, people run the risk of being tricked into believing that they are autonomous when they are not, and of being directed into nonautonomous acts by others [118]. Ryan and Deci [118] claim that when people are unable to acknowledge their needs, feelings and motives mindfully, they are highly exposed to being controlled and inauthentic. In contrast, total awareness of what is taking place in the present moment supports responsibility and volition [118]. Ryan and Deci [118] state: “In fact, with awareness, people have a better grip of what is going on, including what is determining or influencing their behavior.” (p.474). Kabat-Zinn [109] reflects upon the importance of being present as follows: “If what happens now does influence what happens next, then doesn’t it make sense to look around a bit from time to time so that you are more in touch with what is happening now, so that you can take your inner and outer bearings and perceive with clarity the path that you are actually on and the direction in which you are going? If you do so, maybe you will be in a better position to chart a course for yourself that is truer to your inner being ...” (p. xvi). Tolle [119] also claims that people are empowered when they are fully present, because they then see very clearly what needs to be done and can take the right action at the right time, focusing on one thing at a time.

Mindfulness is typically cultivated by formal meditation exercises such as sitting or walking meditation, mindful movements, or informal meditation exercises,

such as being present in everyday activities (e.g., when drinking tea, washing the dishes, talking to friends, or washing hands) [2].

3.5.2 How does mindfulness work?

Since the concept of mindfulness was introduced to Western medicine, efforts have been made to define and operationalize it. Common to all definitions are the following four components: the ability to regulate attention, an orientation to present experience, awareness of the experience, and an attitude of acceptance (nonjudgmental) toward the experience [120]. Bishop et al. [121] suggest a two-component model, where the first component refers to the regulation of attention to focus it on immediate experiences, and the second component involves approaching one's experience with an orientation of curiosity, openness, and acceptance, regardless of the valence and desirability of the experience. Shapiro et al. [122] later have suggested a three-component model of how mindfulness works: (1) attention, (2) intention, and (3) attitude. Intentionally paying attention with a nonjudgmental attitude leads to a significant change in perspective, a so-called "reperceiving." Reperceiving is defined as a shift in perspective characterized by being able to step back from, and to be less identified with, one's thoughts and emotions [122]. Being less identified with emotions and thoughts may result in these processes losing power: "I am not my thought," "I am not my depression" [119, 122]. Therefore, reperceiving allows for a disidentification from consciousness and its content to achieve better objectivity and clarity. This may lead to a more adequate relationship of thoughts, actions, and emotions. In short, mindfulness can be seen as a state of mind that creates an attitude of acceptance toward whatever the present moment brings. It opens one to clarity and acceptance, and makes one capable of relating to the world as it is in preference to how one wishes it to be [122]. Brown et al. [114] suggest that the mechanisms of mindfulness are (1) insight, (2) exposure, (3) nonattachment, (4) enhanced mind–body functioning, and (5) integrated functioning.

Hölzel et al. [123] integrated the existing theoretical literature into a theoretical framework and suggested that mindfulness practices comprise a process of self-regulation differentiated by the following distinct but interrelated components. (1) Attention regulation, which is highlighted as an especially important mechanism of mindfulness [121-123], as the basis of all meditation techniques, and as a likely prerequisite for other mechanisms to take place. (2) Body awareness—the

ability to notice subtle body sensations—helps to detect physiological aspects of the feelings present (e.g., body tension, rapid heartbeat, short, shallow breathing) and provides information that is a prerequisite for accurate identification of the emotional response triggered (e.g., fear). (3) Emotion regulation, regulating for nonreactivity, and relating to each experience differently rather than having a habitual reaction (e.g., simply noticing the fear as opposed to engaging in avoidance mechanisms). Rather than being stuck in habitual reactions to the external and internal environment, the meditator can experience the transitory nature of all related perceptions, emotions, or cognitions in each moment of experience. (4) Changes in perspective of the self—i.e., awareness of the transitory nature of the self and one’s momentary experiences—leads to changes where self-referential processes become diminished while first-person experience becomes enhanced. This process leads to enhanced self-regulation (i.e., a process that enables individuals to guide their goal-directed activities by modulation of thought, affect, behavior, or attention via deliberate or automated use of specific mechanisms [124]).

Some researchers [125] have also suggested that mindfulness is a multifaceted construct and have proposed a five-facet model of mindfulness of which the facets are “observe,” “describe,” “act aware,” “nonjudge,” and “nonreact.” Baer et al. [125] argue that viewing mindfulness as a multifaceted construct may help in understanding its components and its relationships with other constructs. In the present thesis, mindfulness is operationalized using Baer et al.’s “Five Facet Mindfulness Questionnaire” [125].

3.5.3 Different mindfulness-based approaches

Within the past two decades, several mindfulness-oriented interventions have been developed [126, 127]. The four main treatment programs that attempt to teach mindfulness are Mindfulness Based Stress Reduction (MBSR) [2], Mindfulness Based Cognitive Therapy (MBCT) [117], Acceptance and Commitment Therapy (ACT) [128], and Dialectic Behavior Therapy (DBT) [129]. Each program has different origin in relation to the theoretical influence and populations treated. And although MBSR and MBCT are organized around the principal idea of mindfulness, ACT and DBT each have a central mindfulness element as well [130]. MBCT, ACT, and DBT are often placed in the category of “third wave” behavioral and cognitive interventions [131, 132], and some authors also place MBSR in this category [133]. The “third wave” of

behavioral and cognitive interventions has been typified as placing more emphasis on the context and function of cognitions, emotions, and behavior, and paying greater attention to contextual and experiential processes of change, than traditional CBT [131]. Many “third wave” approaches are grounded in the idea that paying mindful attention to, and cultivate acceptance of present moment experience, may develop a more healthy relationship with individuals’ experiences, which in turn can lead to reduction in psychological distress [134].

MBSR has played the key role among modern versions of mindfulness practice in introducing mindfulness into the field of medicine and psychology [130]. Further interventions that have subsequently been developed, like MBCT, ACT and DBT, are influenced by the MBSR. MBSR is the only modern mindfulness intervention that is overtly rooted in Buddhist tradition. Nevertheless, it remains a secular intervention in spite of its important Buddhist derivations [127]. In short, MBSR was started for treating chronically ill patients, and is organized as a manualized eight-to ten-week group intervention program. Several mindfulness meditation skills are taught, and the main techniques are: body scan, sitting meditation and Hatha yoga practice [2]. Participants are taught to practice mindfulness skills for at least 45 minutes per day outside group meetings [135]. Mindfulness in terms of MBSR is used in the MVRP investigated in the present thesis, and is described more in detail in section 3.6.1.

MBCT is an eight-week manualized group intervention program adapted from the MBSR model [117]. It was developed in the 1990s, as a secular, clinical intervention for the prevention of relapses of major depression. MBCT teaches the mindfulness practices of MBSR, and a further source for MBCT is Cognitive Behavioral Therapy (CBT) [136]. The mindfulness aspect in MBCT is learning to see that “thoughts are not facts”, and that it’s possible to let thoughts come and go, instead of trying to argue them out of existence, like in traditional CBT. MBCT differ from MBSR in that: MBCT includes specific exercises and techniques derived from CBT; provide material about major depression; and the use of a fourth formal practice named “the three-minute breathing space” [127].

ACT is theoretically based in contemporary behavior analysis as it is related to the contextual world view and the use of language [137, 138]. Although ACT does not incorporate mindfulness meditation exercises, it is included among mindfulness-oriented interventions because several of its strategies (e.g., helping patients cultivate present-centered awareness and acceptance) is consistent with that of

other mindfulness approaches [126]. ACT has been delivered in both individual and group settings, with durations from one day to 16 weeks. The main components of ACT are: acceptance (allow experience to be what it is while effectively engaged), cognitive defusion (our thoughts are just thoughts, not what we interpret them to be), contact with the present moment, self as context (identify with the observer of thoughts), values (rededicate one's life to what gives meaning), and committed action (development of patterns of effective action linked to chosen values) [137]. ACT aims to foster acceptance of unwanted thoughts and feelings [127]. Thus, the central aim of ACT is to develop better psychological flexibility by teaching skills that increase an individual's enthusiasm to come into fuller contact with their experiences, acknowledge their values, and commit to behaviors that are consistent with those values [130].

DBT is a multifaceted approach to treat patients with borderline personality who have difficulty regulating emotions [129]. It is based on a dialectic world-view, and the most central dialectic in DBT is the relationship between acceptance and change. A wide range of cognitive and behavioral treatment procedures designed to change thoughts, emotions, or behaviors, are included in DBT [135]. Mindfulness skills are taught in the context of a skill-training group as an exposure strategy aiming to reduce avoidance of difficult emotions and fear responses, and as a way of helping patients increase self-acceptance [126]. The mindfulness skills are similar to those targeted in MBSR, but the concepts are organized somewhat different, and DBT does not prescribe a specific frequency or duration of mindfulness practice. The mindfulness skills in DBT consists of three "what" skills (observe, describe, and participate), and three "how" skills (nonjudgmentally, one-mindfully, and effectively) [126, 135]. Specific exercises that are used to foster mindfulness include bringing mindful awareness into daily activities, observing breath by counting, and visualizing thoughts, feelings and sensations as they were clouds passing by [126].

All these mindfulness approaches have a common basis in that they include explicit focus on present centered awareness. One of the main differences between the approaches is that interventions differ in how they teach mindful awareness. For example, both MBSR and MBCT involve formal meditation training, whereas ACT and DBT on the other hand incorporate a range of informal mindfulness exercises in their treatment approach [126]. Furthermore, while ACT and DBT are concerned with the modification of cognitions, which, in turn, may alter the way the individual perceives

internal and external stimuli – ancient Buddhist meditations, such as Zen, is mainly oriented toward direct perception of pure experience (e.g., sensations, sound). MBSR, and especially MBCT, may be placed somewhere between these two extremes. All modern mindfulness approaches above mentioned have in common that they are directed to the reduction of symptoms of a specific underlying disorder (such as stress or major depression) [127].

3.5.4 Researching mindfulness

Previous research has demonstrated that mindfulness generally improves both mental and physical health [114]. A systematic literature review of correlational studies on mindfulness and psychological health [126] reported that trait mindfulness has been associated with higher levels of self-esteem, sense of autonomy, satisfaction, agreeableness, vitality, conscientiousness, empathy, competence, optimism, and pleasant affect. Furthermore, that studies have demonstrated significant negative correlations between mindfulness and depression, neuroticism, social anxiety, difficulties in emotion regulation, rumination, absentmindedness, experiential avoidance, alexithymia, and general psychological symptoms [126].

Several of the mindfulness-oriented interventions that have been developed within the past two decades, have received much research attention. In this thesis studies on MBSR is emphasized, because MBSR is applied in the MVRP investigated. A systematic review [126] of RCTs examined the impact of MBSR on psychological functioning among both clinical and non-clinical populations. Overall, these studies found that MBSR reduces depression, anxiety, anger, rumination, general psychological distress (including perceived stress), cognitive disorganization, post-traumatic avoidance symptoms, and medical symptoms. Furthermore, MBSR has been found to improve positive affect, empathy, sense of spirituality, mindfulness, quality of life and satisfaction with life, self-compassion, and forgiveness, among both clinical and non-clinical populations [126]. Keng et al. [126] reviewed RCTs of MBCT, ACT and DBT as well, and concluded that a growing research body supports the efficacy of all four forms of mindfulness-oriented interventions.

A meta-analysis of the MBSR research literature [139] reported robust effect sizes for the impact of MBSR on a number of measures of mental health for a wide range of target groups. The meta-analysis also suggested that mindfulness training

improves parameters of personal development such as empathy and coping, enhances both QOL and mindfulness, and improves some aspects of somatic health. The postintervention effect sizes (N = 1456) were: stress/distress 0.56, depression 0.54, anxiety 0.53, personal development 0.50, QOL 0.57, mindfulness, 0.70 and somatic health 0.31 [139]. However, De Vibe et al. [139] concluded that few of the included studies measured either social functioning or WA and that there is a lack of data about long-term effects of mindfulness on these parameters. Furthermore, a meta-analysis by Grossman et al. [140] demonstrated that MBSR may improve well-being in a spectrum of clinical and non-clinical populations. Improvements were consistently seen across a wide range of mental health variables including psychological dimensions of quality of life, coping style and other affective dimensions of disability, depression, anxiety. Likewise, similar benefits were also demonstrated for health parameters of physical well-being, such as sensory pain, medical symptoms, physical impairment, and functional quality of life estimates [140].

A multidisciplinary stress treatment program including MBSR showed significant effects on the RTW rate compared with treatment as usual and waitlist control, for individuals on sick leave with symptoms of persistent work-related stress [141]. Furthermore, Revalier et al. [142] found that mindfulness interventions positively impact on employee well-being, work performance and psychosocial workplace health. Some prospective workplace studies have been performed to investigate whether mindfulness training reduces sickness absence [143-145]. Dahl et al. 2004 delivered mindfulness skill training to a selected group who were at risk of long-term work disability as a result of stress and musculoskeletal pain. Significantly reduced sick leave was reported for the group educated in mindfulness skills compared with medical treatment as usual. There were no significant differences between the two groups in terms of the impact on stress and pain symptoms, and the findings suggest that mindfulness principally changed the way that these at-risk employees were relating to their symptoms of pain and distress [143].

3.6 Description of the multidisciplinary vocational rehabilitation program

The group counseling program studied here is designed to facilitate a faster RTW for individuals on long-term sick leave. The process of designing the program was driven by employees at a vocational rehabilitation enterprise located in south Norway. The original Norwegian name of the program is "*Personer I Aktivitet og Arbeid (PIA)*," which directly translated means "People in Activity and Work." The first PIA program was carried out in 2005. In 2007, a nationally established and funded measure was introduced, based on, among others, the methodological principles used in PIA [20]; the Norwegian name of this measure is "*Arbeidsrettet Rehabilitering*," which directly translated means "Vocational Rehabilitation." Only general guidelines are provided for this measure [20], and the program differs between different local providers. In the present thesis, it is the local MVRP, designed and provided by a vocational rehabilitation enterprise in south Norway, that is the object of investigation.

The methodological principles for the MVRP [20] are as follows. 1) Empowering people: strengthening the individual based on where he or she stands at the point of departure, enhancing individual resources, and mastering the present circumstances of life. 2) Focus on work: this involves triangular talks between the employer (or NAV for the unemployed), the individual, and an MVRP supervisor. 3) A group-based approach combined with individual counseling. 4) A holistic approach that considers the connections between health, work, private life, and social life. 5) Lifestyle counseling to enhance awareness about the interplay between thoughts, feelings, and body responses. 6) Confluent pedagogy: "To learn is to experience"; i.e., learning is a process where emotional, intellectual, and physical/psychomotor aspects interflow and integrate. 7) The supervisors are actively present in the process of learning. 8) Physical activity is central to the program, with the principal goal of strengthening core muscles and enhancing balance, strength, endurance, and coordination. 9) Usefulness: after completion, the participants must have learned something that benefits their working day, and they should be able to make use of their new knowledge/skills.

Though the program uses elements from different disciplines, the concept of awareness is essential and continues as a core theme through the entire program. The idea of a combination of individual counseling and working in groups is also

crucial, and the group process is regarded as important. The elements from several disciplines that are used in the MVRP are described below.

3.6.1 Mindfulness Based Stress Reduction

Mindfulness Based Stress Reduction (MBSR) [2] was developed in 1979 by Dr. Kabat-Zinn at Massachusetts University Hospital, to help people to cope with stress [110, 146]. It was developed in a behavioral medicine setting for populations with a wide range of chronic pain and stress-related disorders. The practice of mindfulness in the form of MBSR encompasses sitting meditation, body scanning, hatha yoga and practicing being present in everyday moments [2]. Sitting meditation involves just sitting on a chair or on the floor, doing nothing, focusing attention on breathing by observing the breath as it flows in and out. The body scan is a meditation technique used to reestablish contact with the body. It involves lying supine and moving one's attention through the different regions of the body. Hatha yoga consists of gentle stretching and strengthening exercises, done very slowly, with moment-to-moment awareness of breathing and of the sensations that arise when the body is in various configurations known as "postures." Being present in every moment is the process of attempting to focus moment-to-moment attention on the tasks, experiences, and encounters of ordinary living such as working in the garden, brushing the teeth, taking a shower or a bath, playing with the children, cooking dinner, or eating dinner [2].

3.6.2 Vitality Training Program

The Vitality Training Program (VTP) was originally developed for individuals with chronic musculoskeletal pain [147, 148]. The program is designed based on a phenomenological perspective of the individual; i.e., bodily experiences are not understood as isolated events but are viewed in the context of the whole person. The human body is acknowledged as a subject and carrier of meaning [149]. The theoretical foundations for the underlying philosophy and content in the intervention were based on a phenomenological understanding of the body [150], mindfulness [2], and the psychology of personal constructs [151, 152], while gestalt psychology and the principles of confluent education inspired the theoretical foundations for the methods used in the learning process [153-156]. The VTP [148] aims: 1) to enhance awareness of the present moment; 2) to improve awareness of possibilities and

personal resources rather than focus on limitations and symptoms; 3) to enhance awareness of the relationship between inner experience, interpretation of these experiences, and behavioral patterns; 4) to facilitate learning as an individual discovery process that cannot be forced; 5) to include emotional, cognitive, and behavioral learning processes; and 6) to create experiential learning situations where participants are encouraged to respond and relate actively to any topics and issues addressed [157].

The essential concepts in developing the VTP were [157] awareness, a “here-and-now” focus, and the paradoxical nature of change (i.e., change is desired but is not forced to come about by having a predefined goal. When an individual stops trying and accepts what is, paradoxical changes appear) [153, 158].

Contact with the group facilitators and the other individuals in the group is regarded as an important part of the process. Individuals grow and change through contact, whereas relationships with others provide the potential for dialog and new meanings, energy, and process. This process can include the awareness and acknowledgement of inner experiences and feelings, such as feelings associated with the contact, and is never purely cognitive [147, 156, 157].

The VTP attempts to strengthen the individual’s ability to make choices in accordance with his or her own values rather than the expectations of others or what he or she thinks is socially acceptable. In the process, attention is focused on identifying what is important to the individuals, their values, and their deepest needs [157].

3.6.3 Physical activity

Through the physical activities (PAs) in the MVRP, individuals are challenged to discover new experiences and become more aware of themselves and their body. These PA-framed experiences are hypothesized to have the potential to be transferable to other themes in the MVRP; e.g., mindfulness, VTP, and psychomotor physiotherapy [159]. The health benefits associated with PA have previously been documented in a large body of research [160-163]. Furthermore, a systematic review and meta-analysis of randomized controlled trails investigating the effectiveness of PA in patients with non-specific low back pain on WA, reported that PA interventions had a significant effect on WA in the long term [164]. Physical exercise interventions seem generally effective in reducing work disability in individuals with subacute and

chronic low back pain, and on pain reduction in individuals with neck and/or upper extremity disorders [165]. A meta-analysis of RCTs of exercise in individuals with non-specific low back pain, demonstrated that FA significantly reduces sick leave [166]. In the MVRP, PA is used methodically to achieve enhanced physical, psychological, and social capacity. In all PAs and exercises, individuals are given opportunities to become familiar with their own limits, both physically, psychologically, and socially, and gradually experience that they are able to alter these limits and to enhance their capacity [159]. Long-lasting pain and illness often results in compensatory behavior patterns, both physical and psychological, and it is often difficult for individuals to detect and understand their own compensatory patterns [167]. Therefore, it is of great importance that through the PA, the participants achieve experiences that make them aware of all the information that is stored inside their body, and that this information is meaningful for them to use in their healing process [159]. Through listening to their body and gradually creating a sense of confidence in the body's signals, individuals are given a unique opportunity to understand their body better and to "take back control." [167, 168]

The basic training (balance, coordination, and stability) in the MVRP comprises planned and structured exercising in groups, with the possibility of individual adjustments either within the group or through individual activity/training. Core training is emphasized in the MVRP, based on the argument that it is appropriate to start with core training and to strengthen this particular area before continuing with other more demanding exercises [159]. Demanding PAs and daily activities in general require muscle control of the core muscles, both to prevent and to rehabilitate any possible injury, and at the same time provide the most appropriate and functional movement patterns [169-172].

3.6.4 Psychomotor physiotherapy

In the MVRP studied here, participants were offered group counseling in psychomotor physiotherapy, as well as one individual counseling session. Norwegian Psychomotor Physiotherapy (NPMP) was developed during the late 1940s [173, 174]. The NPMP approach is inspired by theories of psychoanalysis and character analysis [173], and is based on the premise that the body reacts to physical, psychological, and social strain that over time affects respiration, muscle tension, the ability to relax, flexibility, posture, and body awareness [174]. These elements interact

continuously. The pattern of respiration is regarded as the controlling factor, reflecting the vitality of the actions of the person [173]. NPMP is recommended in the treatment of patients with functional disturbances related to pain and strain in the musculoskeletal system, and those with psychosomatic disorders [174]. The whole body is examined and treated as a functional unit, because function and functional change in different body parts are mutually influential. The patients' respiration pattern is a focus of attention in examination as well as in treatment, because respiration, muscle tension, and emotions are considered to be intertwined.

The aim of NPMP is to address dysfunction by facilitating change through movement and massage closely linked to respiration. The movement exercises consist of grounding, balancing, stretching, and relaxation, in addition to becoming aware of these elements [174]. Body awareness is considered to be essential for improving function and is stimulated in treatment by, for instance, repeatedly asking the patient "what do you feel now?" [167, 174-176]. According to Roxendal [177], body awareness is defined as the bodily aspect of a person's total consciousness of himself or herself. Øien et al. [168] studied the changes in embodied experience in patients with chronic pain who received long-term NPMP. The study indicated that experience of the body is closely connected to the experience of oneself as a person acting in the world. The NPMP approach aims to initiate/induce a bodily adjustment process, where old and dysfunctional habits/movement patterns are replaced with new functional patterns. The goal is to achieve a flexible and stable body without unnecessary tensions that restrict breathing and movement [174].

3.6.5 Individual counseling: Cognitive Behavior Therapy

Participants were offered individual counseling based on Cognitive Behavior Therapy (CBT) [136] once a week. During individual counseling, their total life and work situations were mapped. CBT is an active form of therapy where the dialogue between the therapist and patient defines a clear goal that the client works toward [178]. CBT aims to facilitate more adaptive strategies to manage symptoms and/or an optimistic, but realistic, attitude toward illness [179]. The overall goal of CBT is for the client to become aware of negative automatic thoughts and to understand the relationship between cognition, emotion, and behavior so as to change thoughts, feelings, and behavior patterns that lead to his or her feeling bad. The basic thesis of cognitive psychotherapy is that our ingrained beliefs about ourselves, others, and the

world are the driving force behind our feelings and actions, and that CBT supports patients in overcoming their limitations by changing their thoughts, behavior, and emotional responses [178]. The patient is considered to be the expert on his or her own problems, while the role of the therapist is to help the patient to identify irrational or dysfunctional beliefs and negative automatic thoughts, and then to assist them to identify adaptive solutions and resolve problems [180]. Evidence suggests that CBT diminishes the symptoms of anxiety and stress in particular but also diminishes symptoms of depression [181]. Furthermore, research has shown that CBT enhances WA and RTW in people with common mental disorders [182].

3.6.6 Vocational focus

Participants were offered assistance to communicate their needs and/or problems with their employer (for employed individuals) or with the NAV (for unemployed individuals). In addition, the MVRP provided group counseling on particular themes including the National Insurance Act [10], the Work Environment Act [38], and the Norwegian IA-Agreement [183].

3.7 The need for this study

Research in the field of vocational rehabilitation has largely focused on health problems [184-186] and risk factors or those that hinder RTW [77]. However, it is difficult to understand the factors that promote good health and meaningfulness by studying suffering, disease, and illness [187], and knowledge is needed about factors that can contribute to improved WA, improved QOL, good health, and good work motivation and performance [188]. Improved knowledge is needed about factors that are predictive of successful RTW and improved WA to improve the quality and the targeting of these interventions. Through this doctoral thesis, it is my desire to contribute to the body of knowledge exploring human resources, and particularly the mechanisms that can facilitate enhanced WA and RTW.

3.8 Research model

The overall research models for this thesis, based on previous theoretical and empirical background work and the MVRP content, are presented in Figure 1.

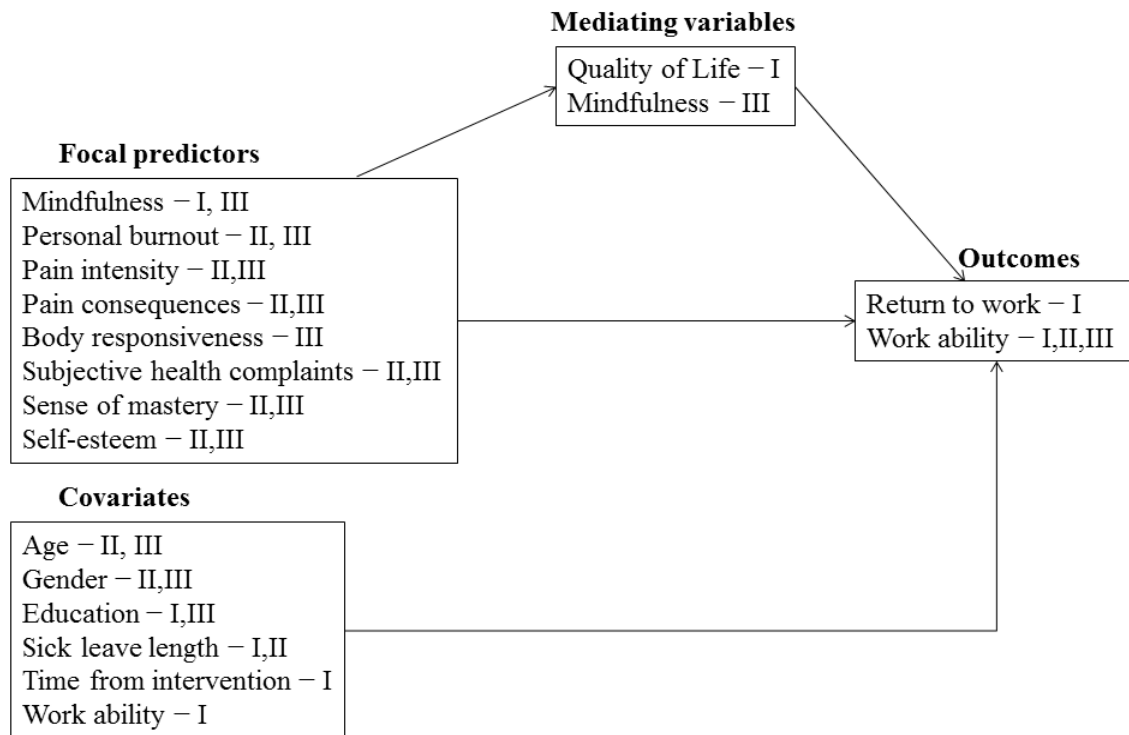


Figure 1. The overall research model.

Note. The numbers I, II and III indicate those constructs included in the different papers. In study I and III the Focal predictors, Mediating variables and Outcomes were measured simultaneously. Therefore, the seemingly temporal relationship in these mediation models are in fact not temporal.

4 Specific aims of the thesis

The overall aim of this thesis was to investigate the determinants of successful RTW and WA after an MVRP for individuals on long-term sick leave in Norway. Mindfulness was a central element in the MVRP [20] and was given special attention. The study investigated both the direct effect of mindfulness on RTW/WA and the mediating influences of mindfulness in the relationship between personal health factor variables and WA. The specific aims were:

- to investigate whether mindfulness is a predictor of RTW, and to examine the indirect effect of mindfulness on RTW and WA through QOL (Paper I);
- to compare WA responders and nonresponders to an MVRP in Norway (Paper II); and

- to investigate whether mindfulness predicts a successful WA response to an MVRP in Norway, and to examine the mediating influences of mindfulness in the relationship between personal health variables and WA response (Paper III).

5 Material and methods

This PhD thesis is based on two separate studies (identified as Study 1 and Study 2). In the process of planning the study and writing the project description, I attended the MVRP as a visiting student for 6 weeks beginning January 2011.

5.1 Study 1: a retrospective cohort study

Study 1 was the first study for which data were collected and reported. Paper I is based on the data from this study.

5.1.1 Design

Study 1 is a retrospective cohort study. Relationships between QOL, mindfulness and WA/RTW were quantified.

5.1.2 Study sample

The study included 80 individuals aged 24–66 (mean age 47/SD 9). All participants in Study 1 completed the MVRP during 2007–2011 and were on long-term sick leave at the time of participating in the MVRP.

5.1.3 Procedure

The study was approved by the National Ethics Committee—Health Region South and by the Norwegian Social Science Data Service (NSD). All former participants in the MVRP in the time-period 2007–May 2011 (N = 200) were invited to participate, and 80 individuals accepted (40% response rate). Confidentiality was assured, and all participants were volunteers who gave their written, informed consent. There were no differences in basic demographic characteristics between nonparticipants and participants. All participants answered a self-report questionnaire (October 2011), using pen and paper or electronically via the internet [189].

Table 1. Sample size, aims, design, time of attending to the MVRP, time of data collection, analysis used in the studies, and the main limitations of the two studies.

	Study 1		Study 2	
	Paper I	Paper II	Paper III	
Title	Return to work after vocational rehabilitation: does mindfulness matter?	What distinguishes responders from nonresponders to a vocational rehabilitation program?	Does mindfulness affect participants' response to a vocational rehabilitation program?	
Sample size	N = 80	N = 74	N = 74	
Study aim	To investigate whether mindfulness is a predictor of RTW, and to examine the indirect effect of mindfulness on RTW and WA through QOL	To compare WA -responders and WA-nonresponders to an MVRP in Norway	To investigate whether mindfulness predicts a successful WA response to an MVRP, and to examine the mediating influences of mindfulness in the relationship between personal health variables and WA response	
Study design	Retrospective cohort	Prospective cohort	Prospective cohort	
Data analyzed	Mainly cross-sectional data	Longitudinal	Mainly cross-sectional data	
Time of attending to the MVRP	2007 to May 2011	August 2011 – August 2012	August 2011 – August 2012	
Time of data collection	October 2011	Before and after the intervention in the time-period August 2011 – August 2012	Before and after the intervention in the time-period August 2011 – August 2012	
Statistical analysis	Logistic regression and mediation analysis (a bias-corrected bootstrapping technique)	Logistic regression	Logistic regression and mediation analysis (a bias-corrected bootstrapping technique)	
Main limitation	The mediation analysis is based on cross-sectional data	Low number of participants and no follow up	The mediation analysis is based on cross-sectional data	

5.2 Study 2: a prospective cohort study

Paper II and III are based on the data collected in Study 2.

5.2.1 Design

Study 2 was a prospective cohort study. Relationships between personal health factors, mindfulness, and WA response were quantified.

5.2.2 Study sample

The intervention group consisted of 74 individuals aged 23–59 (mean age 41/SD 9); all completed the 4–6-week-long MVRP during the period August 2011–August 2012.

Table 2. Sick-leave duration before the MVRP in Study 2 participants (N=74).

Sick-leave duration (in months)	Sick-leave duration before the MVRP (N=74)							Total
	0-3	4-6	7-9	10-12	>12	>24	Missing	
WA-responders	5	9	14	3	4	6	1	42
WA-nonresponders	4	10	8	0	6	3	1	32
Total sample	9	19	22	3	10	9	2	74

Table 3. Self-reported diagnosis in Study 2 participants (N=74).

Self-reported diagnosis	Self-reported diagnosis, physical and/or psychological (N=74)				Total
	Physical diagnosis	Psychological diagnosis	Comorbid physical and psychological diagnosis	Missing	
WA-responders	4	21	10	7	42
WA-nonresponders	6	17	5	4	32
Total sample	10	38	15	11	74

Note. Types of diagnosis reported and defined as physical diagnosis were: musculoskeletal disorders, chronic obstructive pulmonary/asthma, diabetes/high blood pressure, ulcerative colitis, hypothyroidism, cervical cancer; Types of diagnosis reported and defined as psychological diagnosis were: depression, burnout, stress, anxiety, chronic fatigue syndrome, myalgic encephalomyelitis (ME), bipolar II disorder; Types of diagnosis reported and defined as comorbid physical and psychological diagnosis were: fibromyalgia, depression/musculoskeletal disorders, atopic dermatitis/ADD/burnout/anxiety.

5.2.3 Procedure

The Norwegian Social Science Data Service (NSD) and the National Ethics Committee, Health Region South approved the study. Participants were assured confidentiality, and all were volunteers who provided written informed consent. NAV assigned the participants to the MVRP. Invited to participate in this study were all the individuals who participated in the MVRP during the period August 2011–August 2012 (N = 120). Of those invited, 83 individuals accepted, and 74 individuals completed both pretest and posttest (9% dropout). There were no significant differences in basic demographic characteristics between the nonparticipants and the participants. A self-report questionnaire was completed by the intervention group at baseline and posttest. Participants could answer the questionnaire electronically via the internet [189], or using pen and paper.

5.3 The multidisciplinary vocational rehabilitation program

Participants were assigned to the MVRP by the local NAV, who also decided the program duration. The participants attended approximately 6 hours per day, 3 days per week, and most participants attended for 6 weeks. However, NAV assigned some participants to attend for 4 weeks only. The differences in program duration were determined by NAV and were based on the individuals' motivation to continue in the program. An interdisciplinary team (e.g. nurses, physiotherapist, physical education trainer, teachers, and occupational therapists) led the program. The MVRP day routine was most often organized as educational themes in the group-counseling room before lunch (09.00–13.00), and group physical activities after lunch (13.30–15.30).

Participants were offered 1–2 hours of individual counseling each week. Additionally, they participated in 4–5 group sessions every week. An overview of the different topics addressed in the group sessions is provided in Paper II (p.266) [190].

5.4 Measurements

The following section provides information about the variables of interest in the present work (Papers I–III).

5.4.1 Work ability

In both studies, WA was measured by one item, labeled Work Ability Score (WAS), which is the first item in the Work Ability Index (WAI) [191]. Papers I, II, and III all included this instrument, used in different ways according to the aims of the different papers. The WAS has been reported to measure WA validly among individuals on long-term sick leave [103]. Using a scale ranging from 0 (*completely incapable of work*) to 10 (*my best WA ever*) the participants were asked to report “current WA compared with my lifetime best.” The WAS scores were subcategorized as: excellent (10 points), good (8 or 9 points), moderate (6 or 7 points), and poor (0–5 points) [101, 192].

5.4.2 Present work and benefit situation

To measure the participants’ present work and benefit situation, four questions were used. The outcome variable RTW in Paper I is based on this information. The first question assessed RTW rates after completing the MVRP: “After the vocational rehabilitation program I returned, partly or mainly, to work” Categorization of the responses were: (1) “Immediately, or within 14 days,” (2) “Within one month,” (3) “Within two months,” (4) “Within three months,” (5) “Within six to twelve months,” or (6) “Have not yet returned to work.” The second question listed 11 statements to determine the participants’ present work and benefit situation: (1) “I am working, mainly or partly,” (2) “I am on sick leave, mainly or partly,” (3) “I participate in work preparation training,” (4) “I participate in rehabilitation,” (5) “I receive a work assessment allowance,” (6) “I am undertaking education,” (7) “I am an active job seeker,” (8) “I receive a disability benefit,” (9) “I have applied for a disability benefit,” (10) “Other measures. Specify: ...,” or (11) “Other allowances. Specify:” Participants were instructed to mark all the statements that applied to their current situation.

The third question identified the participants’ main source of income, using the categories: (1) “Ordinary salary,” (2) “Sick leave benefit,” (3) “Work assessment allowance,” and (4) “Other.”

The fourth question assessed whether the participants were employed or not. The respondents were asked “Are you currently employed?” and were given the alternatives “yes” or “no.”

Questions 1, 2 and 4 were derived from a questionnaire developed by a national group of occupational researchers and practitioners aiming to achieve a standardized outcome measure for MVRP in Norway (M. Eftedal, personal communication, May 5, 2011).

5.4.3 Mindfulness

In Papers I and III, the Norwegian version [193] of the Five-Facet Mindfulness Questionnaire (FFMQ) [125], was included as a measure of the general tendency to be mindful in daily life. Psychometric support for the measure is derived from analysis by Dundas et al. [193]. The five subscales are as follows: *Observing facet*; i.e., attending to or noticing internal and external stimuli, such as sensations, emotions, cognitions, sights, sounds, and smells. Example item: "I notice the smells and aromas of things." *Describing facet*; i.e., noting or mentally labeling these stimuli with words. Example of item: "I am good at finding words to describe my feelings." *Acting with awareness facet*; i.e., attending to one's current actions, as opposed to behaving automatically or absentmindedly. Example of item: "I find myself doing things without paying attention (scale reversed)." *Nonjudgment of inner feelings facet*; i.e., refraining from evaluation of one's sensations, cognitions, and emotions. Example of item: "I think some of my emotions are bad or inappropriate and I should not feel them (scale reversed)." *Nonreactivity to inner experience facet*; i.e., allowing thoughts and feelings to come and go, without the attention being caught by them. Example of item: "I perceive my feelings and emotions without having to react to them." All subscales contain eight items, except the "nonreactivity to inner experience facet," which consists of 7 items. Items are rated on a 5-point Likert-type scale ranging from 1 (*never or very rarely true*) to 5 (*very often or always true*).

5.4.4 Quality of life

In Paper I, the participants' QOL was measured with a single-item measure, Cantril's ladder [194], the here and now dimension. Cantril's ladder is acknowledged as a general scale with good psychometric properties [195]. The participants were asked to rate their sense of present well-being on a scale depicted as a ladder. The scale ranged from 1 "Worst possible life" to 10 "Best possible life."

5.4.5 Sense of mastery

In Papers II and III, the five-item Norwegian version [196] of the sense of mastery scale developed by Pearlin et al. [197] was used to indicate the degree to which participants saw themselves as being in control of the forces that have important effects on their lives. The scale has been found to have good validity and reliability [196]. Example of item: “There is little I can do to change many of the important things in my life.” All items were scored using 5-point Likert scales with anchors at 5 (*strongly disagree*) and 1 (*strongly agree*), and were summarized into a total score, where a higher score indicates higher levels of mastery.

5.4.6 Global self-esteem

In Papers II and III, the Norwegian version [198] of the Rosenberg Self-Esteem Scale [199] was included as indicator of self-esteem. Psychometric support for the Norwegian version of the measure is derived from von Soest [198]. The participants were asked to make judgments about their own self-worth on a scale comprising 10 items (e.g., “on the whole, I am satisfied with myself”). All items were measured using a 4-point Likert scale ranging from 1 (*strongly disagree*) to 4 (*strongly agree*). Possible scale sum score ranges from 10 to 40, where a higher sum score indicates higher self-esteem.

5.4.7 Personal burnout

In Papers II and III, one subscale from The Copenhagen Burnout Inventory [200] was included to measure personal burnout, which is defined as “the degree of physical and psychological fatigue and exhaustion experienced by the person,” (p. 197). Kristensen et al. [200] reported satisfactory estimates of the instrument’s validity and reliability. The Personal Burnout subscale consists of six items and is designed to measure burnout regardless of occupational status. Example item: “How often do you feel weak and susceptible to illness?” All items were scaled on a 5-point Likert-type scale with anchors at 1 (*never/almost never*) and 5 (*always or to a very high degree*). The responses were rescaled to a 1–100 metric, with high scores (≥ 50) indicating high levels of burnout.

5.4.8 Pain intensity/pain consequences

To indicate pain intensity and pain consequences, items from the Norwegian version [201] of the Brief Pain Inventory [3] were included in Papers II and III. Psychometric support for the measure is derived from Klepstad et al. [201] and Tan et al. [202]. The items were aggregated into two dimensions: (1) the Pain Severity Index (i.e., pain intensity), which comprised four items (pain now, average pain, worst pain, and least pain) using a rating scale ranging from 0 (*no pain*) to 10 (*pain as bad as you can imagine*), and (2) the Function Interference Index (i.e., pain intensity), which comprised seven items measuring the level of interference with function caused by pain (general activity, mood, walking ability, normal work, relations with other people, sleep, and enjoyment of life) using a scale ranging from 0 (*no interference*) to 10 (*complete interference*).

5.4.9 Body Responsiveness

In Paper III, responsiveness to bodily sensations was assessed with a 7-item scale developed by Daubenmier [203]. An item example follows: “I listen to my body to advise me about what to do.” A 7-point scale ranging from 1 (*not at all true about me*) to 7 (*very true about me*) rated the responses. Greater body responsiveness is reflected by higher scores. The questionnaire was translated into Norwegian using standardized methods [204].

5.4.10 Subjective Health Complaints

Subjective somatic and psychological health complaints were evaluated in Papers I and II using 12 items from the Subjective Health Complaint Inventory (SHC) [205]. These included shoulder pain, neck pain, upper back pain, arm pain, headache, low back pain, leg pain, anxiety, sadness/depression, dizziness, stomach discomfort (digestive trouble), chest pain, and one item, “other complaints,” that was added to cover the rarer complaints. Psychometric support for the measure is derived from Eriksen et al. [205].

Using a 4-point Likert-type scale ranging from 0 (*none*) to 3 (*severe*), the participants were asked to rate the last month’s severity of each complaint. Based on all items, a total score was computed.

5.4.11 Covariates

Potential effect modifiers included age, sex, education (highest completed education: “high = university or university college level” or “low = high school or lower”), sick-leave length (“less than one 1 year” or “more than 1 year”), and sick-leave duration (1 = 0–3 months, 2 = 4–6 months, 3 = 7–9 months, 4 = 10–12 months, 5 = more than 12 months, 6 = more than 24 months).

5.5 Approaching mediation analysis

To understand the process by which independent and dependent variables are related has long been the goal of many researchers. Mediation models are useful in behavioral psychology because they may help to clarify and understand processes by identifying how and why two variables are related [206]. The concept of mediation can be explained as a third variable that represents the mechanism through which the focal predictor influences the outcome of interest [206]. Mediation analysis can be used to test a theory in terms of the process by which a given effect is produced [207, 208]. Hayes [209] state that “A simple mediation model is any causal system in which at least one causal antecedent X variable is proposed as influencing an outcome Y through a single variable M ” (p. 86). These pathways are established by tracing every possible path from X to Y , in the direction an arrow points. One path leads from X to Y without passing through M and is named the direct effect of X on Y . The second path from X to Y is the indirect effect of X on Y through M . This path first passes from X to M and then from M to Y . The indirect effect show how Y is influenced by X through a causal chain in which X influences M , which in turn influences Y [209].

The terms “mediation effect” and “indirect effect” are often used interchangeably in the literature. However, Preacher and Hayes’ [210] argue that X can exert an indirect effect on Y through M in the absence of an association between X and Y [211]. In this case, it is recommended that the term “mediator” be avoided and instead that the effect be referred to as X ’s indirect effect on Y through M [207].

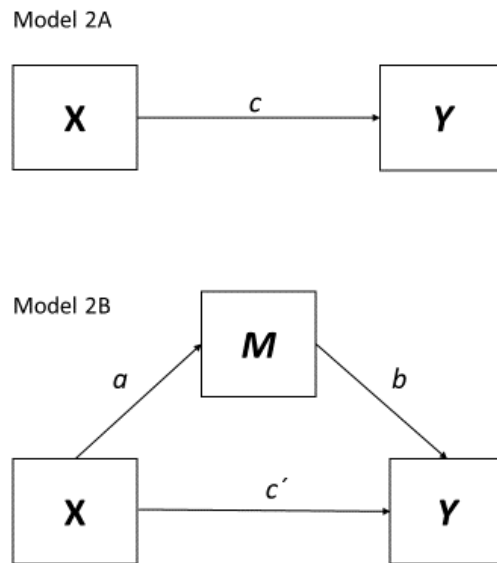


Figure 2. Model 2A: Illustration of a direct effect. X affects Y . Model 2B: Illustration of a mediation design. X affects Y indirectly through M .

The models in Figure 2, represents the two different associations between the variables X and Y that are most relevant to this thesis. The first model (2A) illustrates an unmediated two-variable relation, under which X may be considered to be a possible predictor of Y , and c represents the relation of X to Y , which in the language of path analysis is called “ X ’s total effect on Y .” The total effect c quantifies how much two cases that differ by one unit on X are estimated to differ on Y . X ’s total effect on Y may come through a variety of forces both *direct* and *indirect*. The second model (2B) illustrates a simple mediation model, which represent one possibility of how X may affect Y . In this model the indirect effect of X on Y is defined as the product of $X \rightarrow M$ (path a) and the $M \rightarrow Y$ path (path b), or ab . In most situations $ab = (c - c')$ where c is the simple total effect of X on Y , not controlling for Y , and c' is the $X \rightarrow Y$ path coefficient after the addition of M to the model (i.e., direct effect) [209].

Causal interpretation is the motivation for many research studies even though researchers may not claim that their results provide causal conclusions [212]. It is important to underline that mediation models are causal models. However, it can be argued that statistical analysis of associations cannot establish definite causal links, but only provide descriptive information about relationships among variables. Although statistical analysis based on nonexperimental data cannot identify causality, they may provide suggestive evidence to inspire future experimental designs [208].

The inclusion of a third variable to the analysis of the relationship between an independent and dependent variable increases the complexity and sum of possible relations among variables [213]. Other possibilities than mediator may be that the third variable serve as a moderator, a counfounder, or a covariate. Analysis of moderation relates to the judgment of whether or not a relation between two variables differs as a function of a third variable. A moderator is a variable that changes the direction and/or strength of the relation between an independent and a dependent variable [213]. Whereas a mediator address how or why an effect occur, a moderator variable specify when certain effects are present. [206, 213]. Moderator variables are typically used when the relation between a predictor (independent) variable and a dependent variable is unexpectedly inconsistent or weak (e.g., a relation is present for one subpopulation but not for another, or is present in one setting but not in another). In contrast, mediation is best done in the case of a strong relation between the independent and the dependent variable [206]. Another type of third variables may be counfounders. A counfounder has been defined as “a variable that changes the relation between an independent and dependent variable because it is related to both the independent and the dependent variable” (p. 6) [213]. Another possibility is that the third variable is another predictor of Y, often named covariate. A covariate has been defined as “a variable related to the dependent variable that typically has a minimal relation to the independent variable” (p. 6) [213].

5.6 Statistical analysis

A summary of the statistical analysis of the three papers is presented in this section. Data were analyzed in SPSS for Windows (version 19 and 22, IBM Corporation, Armonk, NY, USA) using standard statistical techniques. However, when performing the mediation analysis in Papers I and III, we extended the standard SPSS package using Hayes’ [209] macro application «Process» for SPSS.

Descriptive measures of frequencies, percentages, mean values, and standard deviation were calculated for continuous and categorical variables to present the sociodemographic characteristics of the participants and rehabilitation outcomes in the three empirical papers. The measures used in this study were tested for internal consistency [214] using Cronbach’s α .

To assess the magnitude and clinical relevance of the change scores, effect sizes (ESs) were calculated using Cohen's d [215]. The effect sizes were categorized as "no effect"; $d < .20$; "small effect" $d = .20-.49$, "medium effect" $d = .50-.79$; and "large effect" $d > .80$. Standardized effect size allows for comparison of effects across the different outcomes [215].

Data were found to be missing completely at random (MCAR) for all variables used in the three papers. The percentages of missing values varied, ranging from 1.3% to 3.8% in Paper I, and 1.4% to 2.7% in Papers II and III. To accommodate the missing values, mean estimates were calculated from the available data and inserted in place of missing values before computing the scales. In cases where more than two items in a scale were missing, the case was considered as missing.

In Paper I, logistic regression analysis was performed to assess the impact of mindfulness on the likelihood that respondents would RTW. In addition, a bias-corrected bootstrapping technique was used to examine indirect effects [209].

In Paper II, logistic regression analysis was performed to investigate the impact of baseline characteristics on the likelihood that respondents would report improved WA from pretest to posttest.

In Paper III, Preacher and Hayes' [207] technique for mediation analysis was used to test the hypothesized model while also controlling for covariates.

The statistical term "prediction" is used to report, discuss, and conclude from the regression analysis [4]. In mediation analysis, additionally the terms "total effect", "direct effect" and "indirect effect" is used [209].

6 Summary of results

6.1 Study 1

6.1.1 Paper I. Return to work after vocational rehabilitation: does mindfulness matter?

The aim of Paper I was to investigate whether mindfulness is a predictor of RTW and to examine the indirect effect of mindfulness on RTW through QOL. Results revealed that mindfulness was indirectly related to both RTW and WA through QOL. There was no significant total effect of mindfulness on WA or RTW. Logistic regression analysis was performed to measure the impact of mindfulness on the likelihood that

respondents would RTW. Results revealed that none of the independent mindfulness variables (observe, describe, act aware, nonjudge, nonreact) significantly predicted RTW. The covariates WA and education level made a unique significant contribution to the model. However, the *observation* facet of mindfulness significantly predicted RTW (OR = 1.28, CI = 1.3–1.59) for “high-educated” participants when the data were analyzed after stratification by education level. We concluded that mindfulness may enhance RTW and WA through QOL, and that for “high-educated” participants, the observation facet of mindfulness significantly predicts RTW.

Table 4. Work status of former MVRP-participants (N=80).

Work status of former MVRP-participants (N = 80)						
Year of attending to the MVRP	2011	2010	2009	2008	2007	2007 -20111
Time from intervention (months)	3-10	11-23	24-36	37-49	50-61	
	N = 9	N = 22	N = 23	N = 24	N = 2	N = 80
Not returned to work	2	5	4	6	1	18
In work-related activity	5	9	5	5	0	24
Returned to work	2	8	14	13	1	38
Total	9	22	23	24	2	80

Note: “Time from intervention” refer to the covariate “time from intervention”, which express the time gap between attending to the intervention, till the data was collected; In all statistical analyses, a dichotomous RTW-outcome variable was used, and participants who were in work-related activity were defined in the “not returned to work” group.

6.2 Study 2

6.2.1 Paper II. What distinguishes responders from nonresponders to a vocational rehabilitation program?

The aim of this paper was to compare WA responders and nonresponders to an MVRP in Norway. Overall, the results from this study indicate that an improvement in WA can be obtained for the total sample, and the proportion of participants identified as having poor WA decreased by 26% from pretest to posttest, shifting toward moderate to even excellent WA. However, the main finding in the present

study was that not all participants responded positively to the intervention in terms of improved WA; 43% of the participants showed no improvement in WA and were defined as WA nonresponders, while the other half (57%) increased their WA in the course of the intervention and were defined as WA responders. At baseline, the two groups did not differ for any basic characteristics. WA responders scored significantly higher on sense of mastery and significantly lower on pain intensity at baseline, compared with WA nonresponders. When investigating the impact of baseline characteristics on the likelihood that respondents would report improved WA from pretest to posttest, both pain intensity and sense of mastery made a significant contribution to the model. The results suggest that not all individuals respond positively to an MVRP in terms of improved WA. Unfavorable WA responses were shown for participants who at baseline scored high on pain intensity and/or low on sense of mastery. Only tentative conclusions can be drawn from this study, and more research, including controlled experiments and longitudinal research, is needed to understand what distinguishes MVRP responders from nonresponders.

6.2.2 Paper III. Does mindfulness affect participants' response to a vocational rehabilitation program?

The aims of this study were to investigate whether mindfulness predicts successful WA improvement after MVRP and to examine the mediating influences of mindfulness in the relationship between personal health-factor variables and a WA response. The results revealed that enhancement of mindfulness during the program significantly predicted improved WA. Furthermore, personal burnout and enhanced self-esteem were both unique predictors of a positive WA response. Mediation analysis showed that mindfulness mediated the effects of personal burnout and self-esteem on the participants' WA response. Increased body awareness and sense of mastery, and decreased pain consequences and SHC were indirectly related to increased WA response through increased mindfulness. The results suggest that enhancing the skills of mindfulness may be important when aiming to improve WA. Longitudinal studies and randomized controlled trials are needed to assess the causal direction of these relationship. The cross-sectional analysis provided in this study should provide a strong foundation for such future trials.

7 Discussion

The aim of this thesis was to examine the potential mechanisms by which WA may be enhanced by an MVRP and to identify responders and nonresponders to the program. Furthermore, an additional aim was to explore the role of mindfulness in the context of RTW. In the following sections, the methods used in Papers I–III are considered, and then the main findings are discussed.

7.1 Methodological aspects

This thesis adds to previous research in several ways. One of the major strengths of the present work is its contribution to the body of research exploring the role of mindfulness in the context of RTW. Researchers endeavor to design and conduct unbiased comparisons using appropriate methods, designs, and research procedures. In practice, however, totally unbiased research is very difficult to achieve. Therefore, some methodological limitations associated with the work described in this thesis must be considered. The validity of a study is often divided into internal and external validity. Internal validity is defined as the degree to which the results are representative for the particular cohort being studied, and it depends on what factors other than the treatment may relate to the observed effects. Threats to internal validity are often related to the design and procedures of the study. External validity is whether the results are applicable to other populations [216]. Both aspects of validity are important in determining whether studies can be used to improve knowledge and to guide further practice.

7.1.1 Study design

Two different designs were used in Papers I–III: a retrospective cross-sectional cohort study (Study 1) and a prospective longitudinal cohort study (Study 2). The limitations associated with these designs are discussed in the following section.

7.1.1.1 Limitations of the cross-sectional design, Papers I and III

The data employed in Paper I were mainly cross-sectional (i.e., all the variables were measured at a single point). We had some baseline data available including information about sex, age, the exact time each participant completed the intervention program, and whether or not the participants had been entitled to a

sickness benefit at the start of the program. In Paper III, when assessing the change in the independent variables, the change in the mediator and the change in the outcome (WA response) occurred simultaneously. Thus, it is impossible to identify which comes first, other than theoretically by using the proposed sequence as guidance [217]. Furthermore, it is not possible to conclude that the intervention produced the changes, because we did not include a parallel control group [216]. In a cross-sectional design, all the variables are measured at the same time and therefore cannot provide clear indices of causality direction [209], which requires a strong theory base and a prospective controlled design [218]. Three criteria are described as necessary conditions for establishing causation: covariation, temporal ordering, and the elimination of competing explanations [209]. However, Mathieu and Taylor [217] argue that in the absence of an experimental or longitudinal design, one might test a mediational model on the basis of the theoretical ordering of variables, and that furthermore, specification of the causal order of variables in mediational relationships is primarily a theoretical exercise. The research design features of experimental controls and temporal precedence only provide additional justification for particular sequences [217]. Nevertheless, a cross-sectional design is appropriate to describe the status of a phenomenon or associations between phenomena at a certain point in time [219]. In cross-sectional studies, the purpose is to describe the associations between variables rather than to infer cause–effect relationships [220].

The theoretical foundation for the causal order between M (QOL) and Y (RTW) in Paper I may be limited, because there are few data available in the literature providing insight about the relationship between QOL and RTW. In Paper III, the theoretical foundation for the causal order between mindfulness (M) and WA response (Y) is also limited, because to the best of our knowledge, no previous studies have investigated the relationship between mindfulness and WA. Prospective experimental design studies are needed to establish the causal ordering of these variables.

In summary, the cross-sectional data used in Paper I and III allow us to determine associations between mindfulness and RTW/WA, but we cannot determine causation.

7.1.1.2 Longitudinal design limitations, Paper II

In Paper II, we aimed to identify WA responders and WA nonresponders from their baseline characteristics. Therefore, our data have the characteristics associated with the limitations of longitudinal design. In Paper II, the dependent outcome variable was a calculated change (the change in WA from pretest to posttest), while the independent variables were based on baseline characteristics. In a longitudinal design, data are collected prospectively on two or more occasions. A longitudinal design is suitable for investigating changes in phenomena or variables over time and for studying associations between an applied intervention and a variable [221]. It is not possible to exclude nonintervention-related influences on the outcome variable without a parallel control group. Nevertheless, two observations are adequate for studying individual processes and can provide information about changes over time [221]. Longitudinal designs offer some advantages over cross-sectional designs when establishing causal association, but covariation over time does not confirm causation, just as covariation at a single time fails to establish a causal association [209, 221]. We cannot conclude that the intervention specifically produced the changes in WA, because we were unable to establish a control group.

7.1.2 Sample representativeness

The extrapolation of results from the study sample of interest depends on the representativeness of the sample [222]. Selection of the study sample and the sample size will therefore influence external validity. Selection bias might be one source of error in the present study. Not all the selected subjects completed and returned the questionnaires, and the nonresponders may have had different overall health from those who replied. Furthermore, in the present study, we could not influence the assignment of people to the program, so the design lacks strict randomization. However, the study sample represent all participants seen over a period, and all participants had completed the rehabilitation program. Because of the relatively small number of participants, it is possible that the generalizability of the findings of the study is limited.

We were not able to include more participants in the intervention group in the prospective cohort study because of a change in the source of funding, which influenced the recruitment procedure of participants to the rehabilitation program. The situation was resolved by including MVRP participants from one additional

vocational rehabilitation enterprise (a daughter company). The fact that the data from the prospective cohort study were collected from two different vocational rehabilitation enterprises, mostly using two different staff, might have limited the consistency of the data. However, the overall ideology and the rehabilitation program was the same at the two enterprises, except that only one of the enterprises offered yoga classes. Not all participants received exactly the same standardized intervention, as would be expected in a randomized controlled trial. However, the aims of this study were to examine characteristics of the individuals in a real setting and how these characteristics might affect WA and the ability of those individuals to reenter the workforce after an MVRP. The population sampled in this study either had been (study 1) or were at the time of participation (study 2) on long-term sick leave; therefore, generalization to other samples and settings should be made with caution.

The response rate in study 1 was 40% (200 were invited, and 80 accepted and completed the questionnaire). In study 2 the response rate was 62% (120 were invited, and 74 accepted and completed both questionnaires). In both studies, the basic demographic characteristics of the participating sample did not differ from those of nonparticipants. However, selection bias may have occurred due to a non-response rate of 60% in study 1, and 48% in study 2. The individuals who did not take part in the study may have had a different health or work and benefit situation from those who replied.

7.1.3 Measurements

Some degree of systematic and random error of measurement may be present in all instruments, including self-report instruments [223]. Measurement errors linked to the individuals might be: social idealizing, the tendency to give positive responses, cultural norms, resistance against giving extreme scores, and the halo effect.

Measurement errors linked to the questionnaire might be: incomprehensible questions, too many questions, or meaningless questions. The total variance in a questionnaire comprises the true variance (real) and the error variance. Error variance can be random (a threat to reliability) and/or systematic (a threat to validity). Random errors occur because of natural variations in the survey process that are impossible to control (e.g., the mood of the participants); it adds variability

to the data but does not generally affect the average score for the group [223]. Standardizing the testing conditions, enhancing the study design, and assuring a sufficient number of participants to minimize the variability of scores around the mean are all techniques used to reduce random error. High reliability indicates that the data has a low random error. Systematic error is caused by factors that consistently cause the measured mean score to appear higher or lower than the true score, and thus, it affects the data's validity [223, 224].

7.1.3.1 Reliability in the present sample

In the present thesis, Cronbach's α was used to measure internal consistency. Cronbach's α is based upon item-to-item correlations in multi-item scales [216, 225] and is the most common measure of scale reliability [225]. A Cronbach's α coefficient higher than 0.70 is generally considered to be satisfactory [225]. However, Cortina [226] notes that such general guidelines need to be used with caution because the value of α depends on the number of items in a scale. Therefore, it is possible to obtain an inflated value of α because of a high number of scale items.

In both our studies (Papers I–III), the Cronbach's α values for the FFMQ were above 0.80 for four of the dimensions (observe, describe, act aware, nonjudge) and above 0.70 for the last dimension (nonreact), which is regarded as indicating good internal consistency and reliability [225].

In Papers II and III, we measured personal burnout, pain intensity, pain consequences, and global self-esteem, and the Cronbach's α for these scales were all above 0.80 both pre- and posttest. We also measured subjective health complaints, which displayed a Cronbach's α of 0.78 pretest and 0.83 posttest. For the variables of body responsiveness and sense of mastery, Cronbach's α dipped below 0.70 at pretest (0.66 and 0.65, respectively), but at posttest, the Cronbach's α values were 0.77 for the body responsiveness scale and 0.83 for the sense of mastery scale.

7.1.3.2 Validity /reliability in the literature

Mindfulness Questionnaires to measure mindfulness are still the object of scientific debate, and some authors have argued that they lack construct validity in measuring the complexity of mindfulness [227, 228]. However, Park et al. [228] reported that the FFMQ received the highest possible rating for the two properties of internal consistency and construct validation by hypothesis testing (i.e., the degree to which

relationships between an instrument and other measures conform to expectations, including differences between known groups). The FFMQ also displayed good structural validity (i.e., support for the dimensionality of an instrument). The construct validity of the FFMQ was evidenced by positive correlations with openness, emotional intelligence, self-compassion, and well-being, and negative correlations with neuroticism, alexithymia, and dissociation. Furthermore, meditators scored higher than nonmeditators on the FFMQ, and meditation history was correlated with the total FFMQ score in meditating samples [228].

Dundas et al. [193] adopted and translated the FFMQ to Norwegian and concluded that the Norwegian FFMQ has acceptable psychometric properties and could be recommended for use in Norway, especially in studies seeking to differentiate between different aspects of mindfulness and how these may change over time. Confirmatory factor analyses showed that a five-factor structure provided an acceptable fit to the data [193]. Correlations between the FFMQ total scores and subscales were positive and significant as expected, with correlation coefficients ranging from 0.45 to 0.65. The FFMQ's convergent validity was examined by testing its association with another well-established measure of mindfulness, the MAAS [111]. The results displayed a strong inverse correlation between the two instruments (because a low MAAS score indicates a high degree of mindfulness) [193]. Conceptual validity was examined by testing the scale's correlation with other relevant constructs, and the results demonstrated that the Norwegian FFMQ total score was inversely correlated with all indicators of psychological health; i.e., neuroticism ($r = -0.61$), depressive tendencies ($r = -0.46$ to $r = -0.65$), emotion regulation difficulties ($r = -0.66$), and rumination and negative thinking ($r = -0.40$) [193]. Dundas et al. [193] found that the observed facet did not have a positive relation to psychological health in the mostly nonmeditating sample. The authors argued that the skill of being able to observe nonjudgmentally one's inner life and environment is a part of the mindfulness construct that might emerge more clearly with more mindfulness training.

Work ability The WAI [191] is the most commonly used tool for measuring WA [229]. However, it has been criticized for containing many disparate questions that more or less indirectly measure WA, especially for people already on sick leave. Therefore, for this population, it is recommended to use just the first item of WAI, the WAS [103].

This recommendation was followed in the present study. The study of Ahlstrom et al. [103], investigated the associations between the WAI and the WAS, and concluded that the WAS could be used as a simple indicator for assessing the status and progress of WA among women on long-term sick leave. The WAI and the WAS were strongly correlated, and both WAI and WAS showed similar patterns of associations with sick leave, health, and symptoms. Furthermore, the predictive value for the degree of sick leave and health-related QOL was strong for both the WAI and the WAS, and slightly less strong for vitality, neck pain, mental health, and stress [103]. Factors found to be associated with a low WAI/WAS score include ageing, obesity, decline in health status, company size, holding a mostly physical professional function, lack of physical activity during one's spare time, low musculoskeletal ability, high mental requirements, lack of autonomy, and heavy physical workload [192, 229].

El Fassi et al. [192] concluded that the convergent validity between WAS and WAI is significant, and in addition, that the first item of the WAI has the highest discriminating power of the entire index.

There are some general considerations that might limit the validity of self-reported WA. A complex interaction of medical, psychological, and social factors influence the recovery from both pain-related disorders [230] and mental health impairment [231]. Gatchel [230] studied psychosocial factors that can influence self-assessment of function and found that the most important was secondary gain—e.g., financial gain and avoiding work while maintaining an income—and that to be dependent and taken care of influences a person's assessment of his or her own ability and recovery, and in turn affects his or her RTW. Secondary loss issues, including emotional distress, psychopathology, somatization, and symptom magnification were reported as major barriers to recovery and assessment of function. In the present study, one possible limitation might also be that individuals report their WA as lower than it really is because they are afraid of losing benefits: in Norway, a person's WA must be reduced by at least 50% for him or her to qualify for the work assessment allowance.

Additionally, in the context of RTW, differences in social security systems, disability management policies, and work legislation across countries/jurisdictions, and even over time within a single jurisdiction, influence the way that work (dis)ability is defined, its eligibility criteria, and how it is measured and recorded. This

in turn makes comparisons between populations of compensated workers very difficult and limits the interchangeability of empirical evidence [37].

Return to work Though RTW is a commonly used term, a clear, operational, and consensual definition is lacking. RTW can be referred to as an outcome (e.g., the event of resuming work), or a process in vocational rehabilitation, or a goal [232]. In my thesis, I have referred to RTW as an outcome. In Paper I, RTW was used as an outcome measure. The dichotomous variable RTW was created based on responses to the questions “Present work and benefit situation.” Participants were categorized into two groups: “returned to work” or “not returned to work.” Work status and source of income in the sample indicated a complexity in benefit systems and work activity, important in differentiating RTW rates. In this study, only the participants reporting ordinary salary as their main income were defined as “returned to work” (N = 38). Participants who reported receiving work assessment allowance or disability benefit as their main income were defined as “not returned to work” (N = 42), even if they were in work-related activity or education.

The method applied for assessing RTW in this study is the most commonly used. RTW following long-term sick leave is most often assessed as a dichotomous outcome, measured at a specified point in time preceding a specific event—e.g. onset of disability or a specific intervention [233]—and the commonly used dichotomization of the outcome is “returned yes/no” [233]. Biering et al. [233] compared measures of RTW and concluded that simple RTW measures defining RTW as a cross-sectional work status at a specific point of time will often be sufficient if the main research purpose is prediction of RTW or identification of risk factors for non-RTW. However, more sophisticated RTW measures may be appropriate in cases where vulnerability, prognosis, and sustainability are the core issues [233, 234].

Quality of life The single-item scale that we used to assess QOL, Cantril’s ladder, is considered to be a general scale with good psychometric properties [235]. However, when relying on a single item, the variance because of the specific wording of the item cannot be averaged out. Furthermore, it is impossible to obtain estimates of internal consistency. Normally, the only estimate of reliability for these scales is temporal reliability, which makes it difficult to separate true change from measurement error [195]. The 2-year reliability for Cantril’s ladder was reported to be 0.65 [236]. Larsen et al. [235] validated Cantril’s ladder, and when assessing

construct validity, subjective well-being was expected to relate in a predictable way to personality and temperament variables. Results showed that Cantril's ladder correlated with self-esteem (0.49), symptom checklist (−0.44), neuroticism (−0.35), domain satisfaction (0.51), emotionality (−0.30), and sociability (0.22). When assessing convergent validity, satisfactory interrater correlations with other well established subjective wellness scales were identified [235].

Self-esteem VonSoest et al. [198] validated the Norwegian version of Rosenberg's self-esteem scale [199] and found good reliability (Cronbach's α 0.86). The scale's convergent and discriminant validity was tested using the Norwegian version of The Big Five Inventory [237], and, as expected, a strong negative correlation with the neuroticism factor and a strong positive correlation to the extraversion factor were identified [198]. Research has shown that self-esteem and body image correlate strongly [238], and von Soest et al. [198] found, as expected, that self-esteem correlated strongly with satisfaction with physical appearance.

Personal burnout The core of burnout in The Copenhagen Burnout Inventory (CBI) [200] is fatigue and exhaustion. In the present study, it was meaningful to use just one of the three CBI subscales, the personal burnout scale (the others being work-related burnout and client-related burnout), which is also supported by the authors of the CBI [200]. The personal burnout scale was created to compare individuals regardless of their occupational status (e.g., unemployed, early retired, young people). Both Kristensen et al. [200] and Borritz et al. [239] found that the Cronbach's α for internal reliability was high (0.87). The correlation coefficient between the personal burnout scale at baseline and at follow-up after 3 years was 0.54. Furthermore, an expected pattern of correlations with other measures of fatigue and psychological well-being was found [200]. Personal burnout at baseline showed a negative correlation with health status measured with the SF-36. When testing convergent validity, the strongest correlation, as expected, was between the vitality factor and personal burnout (−0.75), while the correlation coefficient between the mental health factor and personal burnout was −0.67, and that between general health and personal burnout was −0.49. From a theoretical point of view, the personal burnout scale and the vitality scale measure the "same" phenomenon, which is supported by the very strong correlation between the two scales [200].

Feedback from respondents indicated that the questions were easy to understand and answer, and the scales have high face validity [200]. CBI personal burnout also displayed a satisfactory ability to discriminate between different jobs. The results of Kristensen et al. [200] also showed that burnout levels change substantially over time, indicating that the scales do not measure stable traits of individuals but degrees of burnout that may change over time [200]. Winwood and Winefield [240] compared the CBI with another well-established burnout measure, the Maslach Burnout Inventory (MBI) [241], and concluded that the CBI possesses excellent psychometric properties.

Sense of mastery Pearlin et al. [197] reported that the sense of mastery scale was stable over time and that the sense of mastery variable correlated negatively with depression and positively with self-esteem, as expected [197]. Dalgard et al. [196] reported a Cronbach's α of 0.86 for the Norwegian version [196] of the scale.

Body responsiveness Daubenmeier [203] reported Cronbach's α to be 0.83 for the 7-item body responsiveness scale. Furthermore, they reported that body responsiveness correlated negatively with self-objectification and BMI, and positively with body satisfaction and body awareness, as expected. When translating the questionnaire into Norwegian, standardized methods [204] were used.

Pain intensity/pain consequences Tan et al. [202] validated the Brief Pain Inventory (BPI) [3] in people suffering from chronic nonmalignant pain, and the results indicated acceptable internal consistency (Cronbach's α 0.85 for the intensity items and 0.88 for the interference items). Construct validity was tested by factor analysis, and the results confirmed the validity of the two-factor structure of the BPI [202]. Concurrent predictive validity was measured by comparing the two Brief Pain Inventory scales with a measure of pain-related disability (the Roland Morris Disability Questionnaire [242]). As expected, the correlation of the Roland Morris Disability Questionnaire with the BPI interference scale was significantly higher than that with the BPI intensity scale, which is consistent with the expectation that BPI interference measures a concept more similar to disability than pain intensity [202]. Both BPI scales displayed significant improvement from the initial visit to follow-up visit 2 months later, confirming the responsiveness of BPI to detect improvement over time [202].

7.1.4 Statistical validity

Several different statistical tools were used in evaluating the results. The main outcomes were analyzed using normal-theory logistic regression analysis (Papers I, II and III). In addition, a bias-corrected bootstrapping technique was used to test the hypothesized indirect effects (Papers I and III). Bootstrapping is considered to be particularly appropriate for testing mediation in small samples and with dichotomous variables [207, 208].

The required sample size in multiple regression depends on a number of issues, including the desired power, the α level, the number of predictors, and the expected effect sizes. Some procedures and simple rules of thumb to help to decide how many cases are necessary have been suggested [243]. A simple rule of thumb in both linear regression analysis and in logistic regression analysis is that at least 10–15 respondents per variable are recommended to gain sufficient statistical power [244–246]. Therefore, the logistic regression analyses in Paper I may suffer from insufficient statistical power: the proposed model analyzed in Paper I contained 7 variables and the sample comprised 80 participants, which gives 11.4 respondents per variable.

In accordance with Hayes' [209] recommendations, we did not allow the limitations of the data collection efforts to constrain the statistical tools that we chose to analyze what our data were telling us about the process that we studied. Therefore, a strength of the present study is the statistical tools utilized. The use of the bootstrapping resampling approach to calculate 95% confidence intervals (CIs) for the mediation effect, in addition to calculating the products of coefficients, is consistent with recommended modern mediation analytical procedures [208, 211]. MacKinnon et al. [218] tested several methods of mediation for type I error rates and power, and recommended bootstrapping over the Sobel test [247], because the former has greater power while maintaining reasonable control over the type I error rate. The bootstrapping technique does not rely on the assumption of a normally distributed total and indirect effect, whereas the Sobel test [247] assumes that the sampling distribution of the indirect effect is normal. However, in practice, the assumption of a normal distribution of the indirect effect is violated more often than not [218]. The bootstrapping technique produces a more accurate inference by providing more computationally intensive methods. Bootstrapping involves repeated

extraction with replacement of samples from the data set (e.g., 50,000 samples) and the estimation of the indirect effect in each resampled data set. The disadvantages of bootstrapping are few and minor [248]. The accuracy of the CIs obtained is dependent on the number of resamples, and in the statistical tool we used, “Process” [209], even 50,000 resamples is a possible computation.

The studies feature a broad array of potential confounders otherwise known to affect the outcomes under study. The selection of potential confounders was made based on studies of relevant literature reviews, encompassing variables relating to age, sex, sick-leave length, and education level. It is worth considering that a limitation of these studies is the absence of the use of other potential mechanisms as control variables (or alternative mediators). In a complex and multifactorial context like RTW, one must assume many mediating/indirect paths operating simultaneously (some in opposite directions), and these processes might have further explained the process of RTW after MVRP. Nevertheless, this thesis considers functional and psychological health (e.g., WA, mindfulness, QOL, pain intensity, burnout, self-esteem) in the context of RTW after MVRP. Future research would do well to expand on this work to make our understanding of the role of mindfulness in the context on RTW more comprehensive.

7.1.4.1 Assessment of change scores, clinical relevance

ES calculations using Cohen’s d [215] were used in Papers II and III as a standard for measuring clinically meaningful change. The intervention was expected to affect WA, mindfulness, and the other included indicators of personal health factors. Statistically significant change over time may not be synonymous with clinically important change. On the other hand, clinically important changes may not be statistically significant [249]. Calculating ES by Cohen’s d is one way to assess the clinical relevance of change scores on pre- and posttreatment scores, or a difference in changes between two groups [249]. ES can be used to translate changes in health status into a standard unit of measurement that provides a clearer interpretation of the results [249]. Standardized ES allows for comparison of effects across the different outcomes [215]. Cohen’s d is understood to be the standardized difference between two means and is defined by Cohen [215] as the average change from pretest to posttest divided by the standard deviation at baseline.

7.2 Discussion of research questions

The discussion of the role of mindfulness in vocational rehabilitation is conceptualized in the frame of the biopsychosocial model [48], in the present thesis. As discussed in chapter 3, other factors than mindfulness play a major role in the RTW process and in vocational rehabilitation. RTW stakeholders should collect and use all available information about the sick listed individuals' total life situation, together with current available knowledge in the research literature about prognostic factors for RTW – in order to provide individuals on long-term sick leave relevant assistance in the RTW process. If mindlessness is not part of the RTW-problem for the individuals, mindfulness may not serve as a solution either. Effective or not.

When conceptualizing work disability and RTW in a biopsychosocial framework, biological, psychological, and social factors operating as barriers or facilitators are considered. In the context and population evaluated in this study, the social dimension of work disability and the corresponding organizational and system obstacles to RTW may be: 1) Long sick-leave duration before the intervention [51, 66]: In the population sampled in the present study, some participants reported long sick-leave duration before the MVRP (see Table 2). The long duration of sick leave prior the intervention may represent a barrier for RTW in some of the individuals in this study. Although this variable is not modifiable through any intervention, it's important to consider this issue as a possible barrier for RTW in the evaluation of the intervention. 2) Greater age [50, 51]: The participants' age range from 24 years to 66 years in study 1 (see Paper I, Table 1), and from 23 years to 59 years in study 2 (see Paper II, Table 2). And for some of the older participants, age may serve as a barrier for RTW. A recent systematic review by Steenstra [250], of the effectiveness of interventions aimed at promoting work participation in older workers, conclude that multi-component interventions encompassing at least two of three of the components: health service delivery, coordination of services, and work modification, could be recommended by practitioners to help improve work participation in older workers. 3) Financial barriers for RTW: The Norwegian welfare system and the way it is organized bring along that it's not financial worthwhile for some individuals, especially in low paid occupations, to RTW. For example, major barriers to RTW reported for people with mental illness are, among others, the fear of risking their

income, and also the fact that leaving benefits for a paid job would not be financially worthwhile [231].

4) Culture: The present study was carried out in southern Norway. Compared to other Western countries, the level of individuals on long-term sick leave and disability pension is high in Norway [39, 251]. In addition, people in southern Norway have longer duration of sick leave than what is reported for other areas in the country. For example, in the 4. quarter of 2013, mean sick leave duration in Norway were 42 days, whereas 55.5 days in this actual province [252]. A social culture and tradition of benefit dependence in the local province, together with what may be unfavorable attitudes toward work and health, may represent a barrier for RTW in the present sample. 5) In study 2, 37.8 % (28 of 74 participants) of the participants were unemployed (see Paper II, Table 2). For the unemployed participants, the labour market and access to new job opportunities may represent a barrier for RTW. The unemployment incidence in the province where the present study population was sampled is among the highest in Norway (e.g., 3.8 % of the workforce in February 2015) [253]. 6) Involvement from the employer is critically important in the RTW process [48]. The MVRP studied in the present thesis address this issue, and include meetings and assistance to communicate the participants' needs to the employer. 7) Communication between the different stakeholders in the rehabilitation process is important [254]. In addition, Franche et al. [254] have underlined the importance of determining optimal level and timing of stakeholder involvement. Due to the lack of co-location of the multidisciplinary rehabilitation team and other stakeholders involved, close communication may be difficult to achieve in the context studied [255]. 8) The diagnostic criteria used by physicians to certify sick leave, do not include individuals' total life situation or account for extreme life events. For example, many individuals who are certified to sick leave by a psychiatric diagnosis, suffer from sorrow caused by extreme life events (e.g., loss, divorce) [256]. "Sorrow" is not a diagnosis, and do not qualify for a sick leave certification. Unnecessary time may be spent in the rehabilitation process to identify the underlying problem in some individuals. Especially because some individuals may fear losing their income if they are honest about their total life situation [231].

It's important to keep the above listed contextual issues in mind when discussing the research questions in the following section.

7.2.1 Study 1

Does mindfulness predict RTW after an MVRP? (Paper I)

Summary of the results

- There was no significant total effect of mindfulness on RTW for the total sample.
- For the “high-educated” participants, the “observation” facet of mindfulness significantly predicted RTW.

Is there an indirect effect of mindfulness on RTW and WA through QOL? (Paper I)

Summary of the results

- Mindfulness was indirectly related to both RTW and WA through QOL.

Although mindfulness training is included in vocational rehabilitation and is used in Norway as one method for treating sick leave, little is known about how mindfulness directly and/or indirectly affects RTW and WA. Our data suggest that mindfulness is not a predictor of RTW for the total sample, which means that the individuals who have successfully returned to work in the total sample are not more mindful as a group than the individuals who have not yet returned to work. However, in the “high-educated” participants, the observation facet of mindfulness significantly predicted RTW. These results may indicate that mindfulness alone is unlikely to help “low-educated” individuals to RTW quickly. In accordance with other studies [69], our results confirm that “low-educated” people need more time to RTW fully. Furthermore, and congruent with previous research [19], we found that WA significantly predicts RTW.

Based on the positive correlations seen in the present study between mindfulness and QOL and between QOL and RTW/WA, together with previous empirical qualitative research [21, 22] on the particular MVRP studied here, which reported improved QOL during the intervention, we decided to investigate whether there was an indirect effect of mindfulness on RTW through QOL. The identification in the present study of an indirect effect of mindfulness on both RTW and WA through QOL expands on previous findings suggesting positive relationships between mindfulness and QOL [139] and between QOL and RTW [257, 258]. Following Hayes’ [211] argument and technique, we continued with tests for indirect effects despite the absence of a significant total effect, and in fact, in a complex context like RTW

where one must assume many indirect paths operating in opposite directions, we could have missed important information by requiring a significant total effect before continuing with tests for indirect effects.

Other contextual factors than those included in the analysis may have influenced the RTW outcome, such as work-related / social factors (e.g., duration of time off work, duration of unemployment, job characteristics), systemic factors (e.g., time prior beginning a rehabilitation program, program duration, level of collaboration between stakeholders), personal factors (e.g., expectations, health behavior) [50, 71]. Given the small sample size, it was not possible to include more variables in the model, because it would have increased problems associated with low statistical power. The findings of the study should therefore be interpreted with caution [220, 259].

One can argue that participants who had attended to the MVRP less than one year ago, at the time of data collection, should have been excluded from the analysis. As Table 4. demonstrate, in 2011-participants, only 2 out of 9 participants had returned to work (5 participants were in work-related activity), whereas in 2008-participants 13 out of 24 participants had returned to work. The data collection was completed relatively short time after finished MVRP for some participants, and for other participants nearly 5 years after finished MVRP. This large time-span variation in the participating sample may have hampered the validity of study results.

The cohort used in the present study is not representative for the working population in Norway, but rather represent occupational subgroups known to have an above average level of sick leave, and also a lower RTW rate than the Norwegian population in general. Individuals referred to extensive MVRPs have not managed to RTW by themselves or with support from the primary health service. These individuals will usually have more complex problems and needs beyond health problems, such as difficulties in the work and/or home situation, or other social circumstances [260]. Therefore, generalization to other settings than people on long-term sick leave is limited.

In sum, the results presented in Paper I may support the use of mindfulness in the context of RTW by suggesting that mindfulness is indirectly related to both RTW and WA through QOL. But, given the correlative nature of the data, definitive conclusions about direction of the relationship cannot be drawn. Future research should use a prospective controlled design, to study whether mindfulness may

mediate the relationship between personal health factors and WA in a vocational rehabilitation program.

7.2.2 Study 2

What distinguishes responders and nonresponders to a vocational rehabilitation program? (Paper II)

Summary of the results

- An improvement of WA was obtained in the total sample.
- The proportion of participants identified as having poor WA decreased by 26% from pretest to posttest, shifting toward moderate to even excellent WA.
- 43% of the participants showed no improvement in WA and were defined as WA nonresponders, while the other half (57%) increased their WA in the course of the intervention and were defined as WA responders.
- WA nonresponse was significantly predicted by high pain intensity and low sense of mastery at baseline.

Does mindfulness affect participants' response to a vocational rehabilitation program? (Paper III)

Summary of the results

- Enhanced mindfulness in the course of the program significantly predicted a successful WA response.
- Decreased burnout and enhanced self-esteem were both unique predictors for a positive WA response.
- Mindfulness mediated the effects of personal burnout and self-esteem on the participants' WA response.
- Increased body awareness and sense of mastery, and decreased pain consequences and SHC were indirectly related to a successful WA response through increased mindfulness.

Papers II and III are based on the same dataset and have identical dichotomized outcome variables, identified as WA responders/nonresponders in Paper II and as WA response in Paper III. Therefore, the findings in these two papers clarify and supplement one another.

Identifying the characteristics of responders and nonresponders to vocational rehabilitation programs is important when aiming to improve the selection of eligible individuals who are most likely to benefit from the program. As reported in Paper III, individuals who reported improved mindfulness in the course of the program also typically reported improved WA. Paper II showed that at baseline, WA responders typically reported significantly lower pain intensity and higher sense of mastery compared with WA nonresponders. The results from study II (Papers II and III) demonstrate that the WA nonresponders (who reported higher pain intensity and lower sense of mastery at baseline), also did not improve any facet of their mindfulness, while the WA responders improved significantly in all facets of mindfulness except the facet “nonreact.” In other words, it seems that high pain intensity and low control/sense of mastery at baseline inhibit improvement of both mindfulness and WA in the course of the MVRP.

In our study, both pain intensity and sense of mastery were identified as predictors of an unsuccessful WA outcome. Our results are in accordance with previous research that demonstrated that individuals with low perceived control benefited less from vocational rehabilitation [67, 80, 261]. Furthermore, our results agree with previous research identifying pain intensity as an important prognostic factor for functional status after an MVRP [262], a predictor for long-term sick leave lasting more than 1.5 years [59], and illness perception as a factor that hinders RTW [98]. The results of the present study add to the literature that pain intensity and sense of mastery also affect rehabilitation outcomes in terms of WA.

In Paper II, we propose that these differences in the WA response might have occurred because the nonresponders at baseline experienced a higher pain intensity, which may have distracted them from absorbing the MVRP content. Furthermore, cognitive impairment associated with chronic pain is viewed as a considerable barrier to daily activities and rehabilitation [263]. Thus, another explanation for the individual differences in the WA response might be that participants differed in their ability to confront ongoing conscious experiences. Hodgins & Knee [116] claim that individuals who function autonomously will be more receptive and open to assimilate new experiences into their self-structure without trying to avoid or distort such events. Perhaps the successful WA response in participants who scored highly in terms of sense of mastery is linked to more autonomous self-regulation in these participants. We propose that participants with low control may need an intervention

of longer duration and/or higher dose to integrate all the novel experiences in the program into their self-structure and their daily life. We also propose a third explanation for the individual differences in the WA response, suggesting that individuals with a high sense of mastery have higher pain tolerance. A negative correlation between pain intensity and sense of mastery was observed in our study. Previous research has shown that greater perceived control is associated with higher pain tolerance and a less negative pain response [264, 265]. A fourth explanation could be that when participants were encouraged to “listen to their body” and started to become more aware of their body’s signals, people with higher pain intensity experienced their pain as affecting their WA to a higher degree and therefore reported reduced or no improvement in WA at posttest. Therefore, perhaps for these individuals, the intervention did work: they gained a new strategy to deal with their pain, shifting from suppressing body signals to listening to their body signals. If this group comprises “late bloomers,” it is of crucial importance to measure also the long-term effect of such programs. Combinations of these four possible explanations are most reasonable and should be tested in future research under prospective controlled conditions.

In Paper III, we identified mindfulness as a significant predictor of WA response, in line with previous research demonstrating positive effects of mindfulness on depression and anxiety [139, 146, 266, 267], stress and burnout [268], and pain [269]—health conditions that are associated with poor WA and are responsible for the majority of long-term sick leave [31, 33, 270, 271]. Furthermore, our results add to the literature by identifying the direct effect of mindfulness on WA.

The results from our study 2 that were presented in Paper III also demonstrated that both self-esteem and personal burnout significantly predicted WA response and that the effect was mediated through mindfulness. We suggest that one explanation why mindfulness mediated the relationship between personal burnout and WA response in the present study might be the active focus on experiencing and accepting whatever arises in the present moment, both inside and outside the individual. We argued that this shift in focus probably released positive energy in the individuals and consequently resulted in decreased burnout. Brown and Ryan [111] suggest that people higher in mindfulness experience greater subjective well-being and incur less stress. Furthermore, we argue that by practicing mindfulness training, the participants became more focused and aware of present-

moment experiences, and consequently less concerned about esteeming the self. Ryan and Brown [272] suggest that self-esteem will improve under such circumstances.

As reported in Paper III, an indirect effect on WA through mindfulness was identified in the relationship between the independent variables of body responsiveness and sense of mastery. In other words, enhanced body responsiveness and/or sense of mastery predicted enhanced mindfulness, which in turn predicted higher WA. Furthermore, we observed correlations between body responsiveness and personal burnout/self-esteem/sense of mastery, and we argued that further research in the area should explore the role of body responsiveness and body awareness in vocational rehabilitation. Moreover, correlations were also identified between changes in sense of mastery and WAS, indicating that improved sense of mastery is related to an increased WA. Indeed, when conducting the mediation analysis using the continuous WAS change as the dependent variable, sense of mastery was the unique predictor of WAS change, while self-esteem was not. In the present sample, sense of mastery and self-esteem were correlated, which agrees with research [273, 274] that has suggested that the concept of perceived control or sense of mastery and the concept of self-esteem share a common core construct.

Contextual factors other than those included in the models may have influenced the WA outcome, such as workplace factors / social and environmental factors (e.g., culture and social climate of the workplace, social and family support, financial and legal issues), and personal factors (e.g., motivation, cognitive functioning) [9]. Because the small sample size, these factors (among others) were not controlled for in the statistical analysis. Therefore, the findings of the study should be interpreted with caution [220, 259].

Program duration and motivation may have affected the results. 62 participants attended 6 weeks and 12 participants attended 4 weeks. It was the participants' own motivation to continue in the program which were used as criteria to decide program duration. As such, motivational differences could have influenced outcomes. The importance of considering motivational factors that might influence an individual's RTW during a rehabilitation process, has been pointed out [232, 275]. Among others, the individuals' readiness for RTW, will influence on engagement in actions that support a RTW [97].

Accurate timing of actions and interventions in the rehabilitation process is important. RTW can be conceptualized as a complex human behavior change [97]. Both temporal shifts in disability-related beliefs and behavior, and the developmental character of disability [276, 277] is important to consider. It has been suggested that the impact of risk factors may vary across different phases of the disablement process (short-term and long-term disabilities). For example, may the impact of psychosocial risk factors increase with time and become major risk factors in chronic disability, whereas they may play a smaller role in the acute phase of disability [278]. Bültmann et al. [74] argue that besides the impact of psychosocial factors on RTW outcome may differ over time, the strength of associations between psychosocial factors and RTW behavior may also differ between health conditions. Additionally, the majority of studies assessing phase specificity are focusing on sick-listed individuals with musculoskeletal conditions. The patterns for symptoms may be different for mental health conditions that might require a longer time to remit, when compared to musculoskeletal conditions which might remit within weeks. Furthermore, we do not know whether the knowledge on psychosocial factors and theoretical (behavioral) models from the musculoskeletal literature can be transferred to other diagnoses such as mental health conditions [74]. The population sampled in this study is heterogenous with respect to the underlying diagnosis (see Table 3), sick-leave duration before the MVRP (see Table 2), and thus probably in different phases of the disablement process (and readiness for RTW), and all such factors may have influenced the outcome.

Overall, our results from study 2 suggest that enhancing the skill of mindfulness may be useful when aiming to improve WA. However, we emphasize that the definition of a successful vocational rehabilitation outcome is too complex to be limited to one dimension and that our findings should not be misinterpreted as demonstrating that WA nonresponders should not participate in MVRPs. In addition, the long-term outcome of the intervention might differ from the results measured immediately after the intervention and must also be taken into consideration before any conclusion about the intervention can be drawn.

Our findings are important because they identify baseline characteristics that predict an unsuccessful WA response to an MVRP and thus hopefully encourage further exploration of the connection between mindfulness, pain intensity, sense of mastery, and impact of vocational rehabilitation on WA and RTW. Longitudinal

studies and randomized controlled trials are needed to assess the causal directions of the relationships. This study may provide empirical justification for such studies.

7.3 Concluding remarks and future directions

7.3.1 Conclusions

Overall, the findings of this thesis suggest that mindfulness may be a useful tool in vocational rehabilitation. Our results indicate that mindfulness significantly predicted RTW for “high-educated” individuals and that mindfulness training alone is unlikely to help “low-educated” individuals to reenter the labor market more rapidly. However, a higher level of mindfulness predicted increased QOL, which in turn predicted successful RTW/WA.

Individuals seem to differ in how they respond to the MVRP. Unfavorable WA responses were more prevalent in participants who reported a low sense of mastery and high pain intensity at baseline.

When investigating whether mindfulness induces response to an MVRP, we found that mindfulness significantly predicted a successful WA response. In addition, mindfulness was identified as a mediator both in the relationship between personal burnout response and WA response, and in the relationship between self-esteem response and WA response. Increased body awareness, sense of mastery, pain consequences, and SHC were indirectly related to a successful WA response through increased mindfulness. Hopefully our findings will encourage further exploration of the role of mindfulness in vocational rehabilitation. The cross-sectional and longitudinal analysis presented in this thesis should provide a strong foundation for future research, including controlled experiments.

7.3.2 Practical implications

In the present thesis, the role of mindfulness in vocational rehabilitation is reinforced, which suggest that mindfulness may be a useful tool in the context of vocational rehabilitation. But, the long-term effects, and the causal direction of relationships must be examined before any conclusions can be drawn.

Furthermore, our findings may have implications for employers who are seeking methods to reduce sick leave. Previous research [103] has demonstrated that future sick leave is predicted by poor WA, and our results suggest that mindfulness is

a significant predictor of enhanced WA. Therefore, more employers may take advantage of our findings by implementing mindfulness training in their businesses as a method to prevent future sick leave; for example, by offering mindfulness training to their employees during the workday.

Furthermore, our results suggest that a lesser dose of mindfulness training than the original MBSR 8-week intervention was sufficient to enhance the mindfulness level and to improve personal health factors of the participants in the present study. Therefore, our results may support the use of a lower dose of mindfulness training, although perhaps the nonresponders to the intervention may need a higher dose of mindfulness training to profit from the program in terms of improved mindfulness. Therefore, different dosages should be provided to different groups of individuals on long-term sick leave.

MVRPs designed to obtain faster RTW may benefit from including measures to discover and better manage factors related to decreased WA. Measuring pain intensity and sense of mastery may help identify individuals who may need special attention in the RTW process. It would be useful to know about whether pain intensity and sense of mastery impact the course of WA over time. It is unlikely that individuals change in the same way, and as such, important subgroups of individuals may demonstrate distinct patterns of change in WA over time. Identification of such subgroups and their unique patterns of change has the potential to advance current knowledge with respect to pain intensity and perceived control in the RTW process. Therefore, such long-term effects should be measured in serial measurements of outcome during follow up, and statistical tools able to identify subgroups, each with its own specific longitudinal trend, applied (for example latent class growth analysis) [279].

To improve knowledge about, and to ensure provision of appropriate assistance in the vocational rehabilitation process for the nonresponders to such interventions, it is important to continue identifying risk factors for unsuccessful rehabilitation outcomes. In this process, it will be important to ensure that the different RTW stakeholders have access to updated information about the scientific knowledge in the area and to provide correct advice to individuals on long-term sick leave.

The study results suggest that “Low-educated” participants did not benefit from the MVRP investigated here in terms of RTW (Paper 1) but did improve their WA

(Papers II and III). The OECD recommends that upskilling should be of highest priority for “low-educated” individuals on long term sick leave, because contextual factors like marginalization in the labor market may represent a hindrance for the “low-educated” participants to reenter the working force [32]. Our results support the OECD recommendation by demonstrating that mindfulness alone is unlikely to help “low-educated” individuals on long-term sick leave to RTW quickly; therefore, upskilling should be the natural next step for this group in their RTW process.

To identify individuals needing supplementary assistance to succeed with their RTW project, screening instruments should be introduced as part of the rehabilitation process and used actively in the process by RTW stakeholders (i.e., health personnel certifying sick leave, the NAV, and the vocational rehabilitation enterprises). Based on our results, such a screening instrument should include the sense of mastery variable and the pain intensity variable.

This thesis supports the importance of defining program packages for different groups of users in the context of vocational rehabilitation to strengthen the effectiveness of vocational rehabilitation measures. It is of crucial importance that these program packages are based on scientific knowledge and examined in the given context *before* they are offered to a large number of individuals on long-term sick leave, to optimize RTW rates in vocational rehabilitation.

7.3.3 Suggestions for future research

The findings discussed in this thesis have implications for further research. Firstly, we consider a research path focusing on the mediating effects of mindfulness. The next step in this research field should be to explore the mediating or indirect effects of the different facets of mindfulness (i.e., describe, observe, act aware, nonreact, and nonjudge), in the relationship between personal health factors and WA/RTW. Dose–response research is also important when examining mindfulness in the given context.

A second research path is the further exploration of the characteristics of responders and nonresponders to the different vocational rehabilitation measures. Such studies have the aim of identifying and developing relevant vocational rehabilitation program packages for relevant target groups. The next step in this research field should be to investigate the possible moderating effects of sense of mastery and pain intensity in the context of RTW. Moreover, a better understanding

of both pain intensity and the perceived control variable, and how they are possibly related, is needed to help to improve the outcomes of vocational rehabilitation for individuals suffering from lack of perceived control and/or chronic pain dysfunction.

A group-based trajectory modeling methodology to examine vocational rehabilitation outcome, such as WA, could be a useful tool in future research. The usefulness of such an approach is that it allows follow how outcomes develop over time from an individual-centered rather from a variable-centered view [279]. This enables identification of the percentages of individuals following different trajectories in the dataset [280, 281]. Latent class growth analysis identifies differentiated subpopulations (latent classes), each with its own specific longitudinal trend [279]. For example, see Ubalde-Lopez et al. [282], who analyzed work function trajectories, and the effect multimorbidity may have on these trajectories, after RTW following a sick leave episode due to common mental disorders. The authors identified four different groups of workers that followed similar work function trajectories in the year following RTW [282].

Valid measures of WA and RTW are crucial in order to obtain new knowledge about the extent to which, or the way in which, vocational rehabilitation improves WA and RTW. Therefore, development of multifactorial valid measures of WA and RTW should have high priority in the research field. Proceeding with research that aims to identify the factors that influence and enhance WA and RTW is also important in this process.

Most individuals with health impairments need little or no help to stay at work or to RTW, while a limited but significant number of individuals need supplementary assistance [91]. Perhaps development of screening instruments that can be used by RTW stakeholders (i.e., health personnel certifying sick leave, the NAV, and the vocational rehabilitation enterprises) to identify patients at risk of long-term sick leave would be helpful to optimize the vocational rehabilitation process and outcome.

Future research should investigate whether the various elements in the program contribute to facilitating enhanced WA/RTW either independently and/or in concert. Furthermore, future research should examine whether all elements in the program contribute satisfactorily to the desired long-term effect/outcome compared with the effort required and should thereby evaluate the basis for an activity and whether the program would benefit from new or other elements and activities.

It is also necessary to develop randomized controlled prospective longitudinal research designs to achieve understanding of the positive factors in vocational rehabilitation that may improve WA and RTW.

8 References

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Paper I

Return to work after vocational rehabilitation: does mindfulness matter?

Solveig Vindholmen¹

Rune Høigaard²

Geir Arild Espnes³

Stephen Seiler⁴

¹Department of Psychosocial Health, Faculty of Health and Sport Sciences, University of Agder, Kristiansand, Norway; ²Department of Public Health, Sport and Nutrition, Faculty of Health and Sport Sciences, University of Agder, Kristiansand, Norway; ³Research Centre for Health Promotion and Resources, Department of Social Work and Health Science, Norwegian University of Science and Technology, Trondheim, Norway; ⁴Faculty of Health and Sport Sciences, University of Agder, Kristiansand, Norway

Purpose: Mindfulness has become an important construct in return-to-work (RTW) rehabilitation. The aim of this study was to investigate whether mindfulness is a predictor for RTW, and to examine the indirect effect of mindfulness on RTW and work ability through quality of life (QOL).

Methods: A retrospective study was conducted among 80 former participants (71 females and seven males) from age 24 to 66, in a multidisciplinary vocational rehabilitation program (MVRP). Self-report questionnaires were used to measure work status, work ability, QOL, and mindfulness. Demographic data were also collected.

Results: In the current sample, 47% of participants reported having returned to ordinary work. The majority of the non-working sub-sample reported being in work-related activity or education. A bias-corrected bootstrapping technique was used to examine indirect effects. Results revealed that mindfulness was indirectly related to both RTW and work ability through QOL. There was no significant total effect of mindfulness on work ability or RTW. Logistic regression analysis was performed to assess the impact of mindfulness on the likelihood that respondents returned to work. None of the independent mindfulness variables (observe, describe, act aware, non-judge, non-react) made a unique statistically significant contribution to the model. The covariates work ability and education level significantly predicted RTW. However, when the data were analyzed after stratification by education level, the “observation” facet of mindfulness made a significant contribution to the model (odds ratio =1.28, confidence interval =1.03–1.59) for “high educated” participants.

Conclusion: These data suggest that mindfulness may enhance RTW and work ability through QOL. Furthermore, for “high educated” participants the observation facet of mindfulness significantly predicted RTW.

Keywords: work ability, quality of life, multidisciplinary, mindfulness, return to work, vocational rehabilitation

Introduction

Sick leave is a phenomenon that varies both over time and among different groups. There has been a dramatic increase in sick-leave rates in the working-age population over the last 30 years.¹ Musculoskeletal pain, depression, and anxiety cause the majority of all sick leave, and comorbidities are prevalent.^{2,3} Long-term sick leave represents a major economic burden for society, and affected individuals risk financial hardship and social exclusion^{4,5} in addition to increased risk of permanent exclusion from working life through forced retirement due to ill health.^{5,6} Sick leave is a complex phenomenon, and there is no unified theory or consensus regarding the mechanisms leading to long-term sick leave.⁷ Prognostic factors for return to work (RTW) after sick leave vary depending on diagnosis, duration of symptoms and sick leave, and whether or not a

Correspondence: Solveig Vindholmen
Faculty of Health and Sport Sciences,
University of Agder, PO box 422,
NO-4604 Kristiansand, Norway
Tel +47 9946 0380
Email solveig.vindholmen@uia.no

rehabilitation program has been performed.^{8–13} Methods for preventing and “treating” sick leave vary among countries. Multifactorial vocational rehabilitation programs (MVRPs) are suggested as one method for bringing individuals back to work faster.^{14,15} Some MVRPs give mindfulness training considerable attention, and thereby suggest mindfulness training as a potential tool for bringing people back to work after long-term sick leave.

RTW is a complex, multifactorial process, influenced by individual, social, economic, and work-related factors, and indeed not only related to medical health factors.^{16,17} Vocational rehabilitation is aiming to improve work ability,¹⁸ on order to enhance RTW rates. Previous research has identified work ability to be a strong predictor for successful RTW after an MVRP.¹⁹ Moreover, researchers have demonstrated the positive association between quality of life (QOL) and RTW. Sjöström et al²⁰ investigated 40 women and 20 men who had participated in an MVRP, finding that at 2-year follow-up, the majority of the participants reported increased QOL compared with baseline, and most participants had returned to work. Later, Lydell et al²¹ examined psychosocial factors in individuals who had participated in a rehabilitation program 10 years prior, and compared results from individuals who achieved successful RTW with sick-listed individuals. The “returned to work” group showed a significantly higher QOL. Furthermore, two qualitative studies^{22,23} explored experiences and reflections from ten individuals who had participated in the particular MVRP examined in this study, and the individuals reported improved QOL both directly after the completed program²² and at follow-up one year after.²³ The connection between mindfulness training and improved QOL is well established.²⁴ However, to our knowledge, the associations between mindfulness and work ability and RTW through QOL have not yet been investigated. Indeed, the association between mindfulness and work ability is sought after.²⁴

One acknowledged definition of mindfulness is “paying attention on purpose in the present moment and non-judgementally.”²⁵ To be mindful, individuals must be alert to the present moment and not absorbed with thoughts about the past or the future.^{26,27} Mindfulness involves paying attention to both external (environmental) and internal (intrapsychic) phenomena.²⁸ Moreover, achieving a mindful state is an inherent human capacity²⁹ and requires dis-identification from mind.^{30,31} Shapiro et al³⁰ proposed that the fundamental psychological mechanism of mindfulness is re-perceiving. Re-perceiving is defined as a shift in perspective characterized by being able to step back from and be less identified with

one’s thoughts and emotions. One mindfulness program that has received considerable research attention is Mindfulness Based Stress Reduction (MBSR),³² which was developed to help people cope with stress.^{33,34} The practice of mindfulness in the form of MBSR encompasses sitting meditation, body scan, hatha yoga, and practicing being present in everyday moments.³² Research has shown that mindfulness enhances both physical and mental health.²⁷ Several studies have reported symptom improvement associated with mindfulness practice (MBSR), such as: reduced depression and anxiety;^{35–37} increased pain tolerance;^{38,39} decreased stress and burnout;⁴⁰ and improved psychological functioning.^{36,38,41} A recent meta-analysis of the research literature²⁴ reported robust effect sizes for the impact of MBSR on a number of measures of mental health for numerous target groups. Moreover, enhanced mindfulness is reported to improve both QOL, personal development such as empathy and coping, and some aspects of somatic health. However, De Vibe et al²⁴ concluded that very few studies measure the impact of MBSR on work ability, and that there is a lack of data on long-term effects.

The Norwegian Labor and Welfare Administration (NLWA) uses mindfulness as a tool in vocational rehabilitation. Mindfulness in the form of MBSR³² is one of the main components in a nationally established MVRP. The program is funded by NLWA and is offered to people on sick leave and people with self-reported decreased work ability, with the goal of increasing work ability and RTW. When the MVRP was introduced in Norway in 2007, it was reserved for people who had been on sick leave for less than 1 year. From 2009, other users of NLWA were offered this rehabilitation program when reporting reduced work ability. Thus, mindfulness is being increasingly used as a tool to treat many of the psychological and physical conditions that are associated with long-term sick leave. However, research evidence supporting this specific connection between mindfulness training as an intervention and improved work ability and RTW is lacking. Some qualitative studies have been conducted to explore the relationship between self-awareness and work ability.⁴² Some studies have also explored the impact of mindfulness on work related issues such as burnout^{40,43} and work performance.^{44,45} Yet, surprisingly little is known about how mindfulness directly and indirectly affects the likelihood of successfully returning to work after long-term sick leave. The aim of this study was therefore twofold: 1) to investigate whether mindfulness is a positive predictor of RTW; and 2) to examine the indirect effect of mindfulness on RTW and work ability through QOL. The hypothesized model is illustrated in Figure 1.

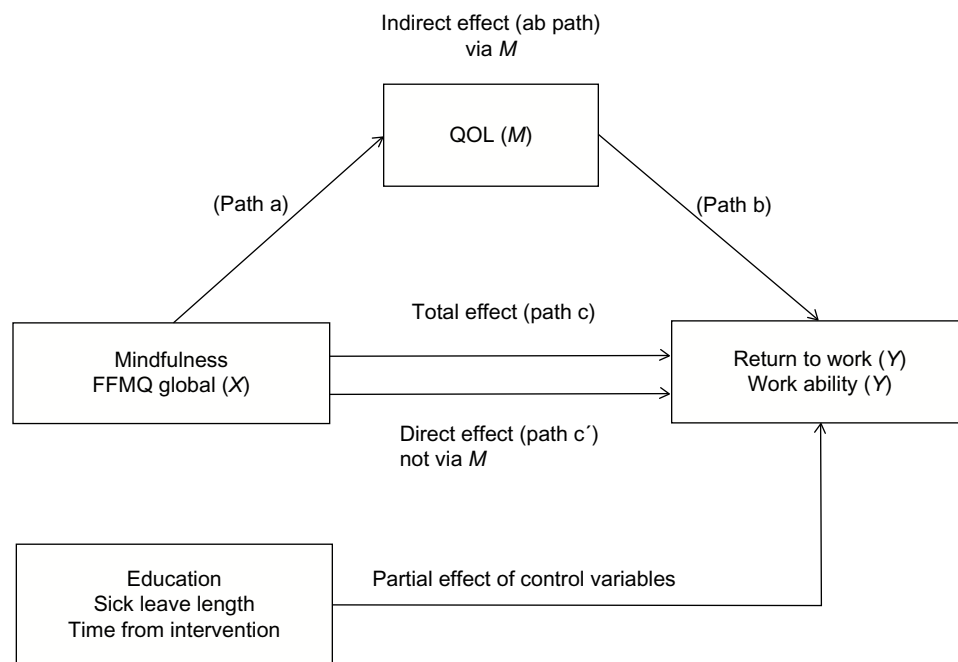


Figure 1 The hypothesized simple mediation model (conceptual model number 4 in Hayes⁴⁶ “Process”).

Abbreviations: FFMQ, Five Facet Mindfulness Questionnaire; *M*, the proposed mediator; *X*, the predictor variable; *Y*, the predicted variable; QOL, quality of life.

Method

Participants

In this retrospective study, the sample consisted of 80 individuals aged 24–66 (mean age 47; standard deviation [SD] 9). Most of the participants were women (91%). All participants had completed a 4–8-week MVRP at a modern vocational rehabilitation enterprise in South Norway in the time period 2008–2011. At the time of participating in the MVRP, the subjects were on long-term sick leave or had reported decreased work capacity. Examples of the most common jobs in the present sample were nurse, auxiliary nurse, teacher, teacher assistant, pre-school teacher, and office worker/clerical assistant. In the sample, 45 participants (56%) were employed and 35 participants (44%) were unemployed at the time of participation in the study.

Intervention

The MVRP consisted of 4–8-week intensive period, where the participants attended approximately 6 hours/day, 3 days per week. All participants were assigned to the MVRP by NLWA, who also decided how long each participant was allowed to participate in the program, individual needs taken into consideration. The team of supervisors was composed of workers with different professional backgrounds (eg, nurses, teachers, physiotherapists, and occupational therapists). All had post-qualifying education obtained while working at the

vocational enterprise. The content of the MVRP was arranged into three categories:

1. Educational program – this component was based on a group-learning program for people with chronic musculoskeletal pain developed and described by Haugli and Steen.^{47,48} The educational program has four cornerstones: 1) mindfulness training;³² 2) confluent education methods;⁴⁹ 3) phenomenological understanding of the body;⁵⁰ and 4) empowering, ie, awareness of personal resources.
2. Physical activity – comprehensive and varied physical activities were applied in the program, aiming to enhance functional strength and core stability, balance, coordination, and overall endurance and strength. Physical activities applied in the MVRP were hatha yoga, cycle ergometer spinning, basic strength and endurance training, and psychomotor physiotherapy. The participants were encouraged to listen to their body, take a break when needed, and not overextend themselves. In this way, the physical activities were used as exercises in challenging personal limits, learning to respond to body signals, and adjusting effort level when needed.
3. Individual counseling – participants were offered individual counseling based on cognitive therapy⁵¹ every second week (three meetings in total), plus one individual counseling session in psychomotor physiotherapy^{52,53} and one counseling session with a sport supervisor whenever

an individual exercise program was preferred by the participant. Moreover, the participants were offered assistance to communicate their needs to the employer (for employed participants) or to the NLWA (for the unemployed participants).

Procedure

All former participants in the MVRP were invited to participate in the study (N=200), and 80 individuals accepted (40% response rate). The participating sample did not differ from nonparticipants in basic demographic characteristics. All participants were volunteers and gave their informed consent. Confidentiality was emphasized. This study was approved by the national ethics committee, Health Region South, and the Norwegian Social Science Data Service (NSD).

All participants answered a self-report questionnaire. Baseline data on whether or not the participants had been entitled to a sickness benefit were extracted from the vocational enterprises database. To be entitled to the sickness benefit in Norway, individuals must have stayed at work for 4 weeks or more. Moreover, benefits confer the right to receive a regular salary of 100% of wages, for a maximum of 248 days while sick.⁵⁴

Instruments

Mindfulness

All participants completed the Norwegian version⁵⁵ of the Five Facet Mindfulness Questionnaire (FFMQ),⁵⁶ which assesses five facets of a general tendency to be mindful in daily life: observing, describing, acting with awareness, nonreactivity to inner experience, and non-judging of inner experience. Examples of items are: “observing” facet, “I notice the smells and aromas of things”; “describing” facet, “I am good at finding words to describe my feelings”; “acting with awareness” facet, “I find myself doing things without paying attention” (scale reversed); “non-judging of inner feelings” facet, “I think some of my emotions are bad or inappropriate and I should not feel them” (scale reversed); and “nonreactivity to inner experience” facet, “I perceive my feelings and emotions without having to react to them.” The “nonreactivity to inner experience” facet consists of seven items, all other facets have eight items each. Items are rated on a five-point Likert-type scale ranging from 1 (never or very rarely true) to 5 (very often or always true). Psychometric support for the measure was derived from analysis in Dundas et al.⁵⁵

Present work and benefit situation

Four questions measured the participants’ present work and benefit situation. Question 1, 2, and 4 were derived from a questionnaire developed by a national group of occupational researchers and practitioners, aiming to obtain a standardized outcome measure to the MVRP in Norway (M Eftedal, personal communication, May 2011).

Question 1 measured RTW rates after completing the rehabilitation program: “After the vocational rehabilitation program I returned, partly or mainly, back to work ...” Responses were categorized as: 1) “Immediately, or within fourteen days;” 2) “Within one month;” 3) “Within two months;” 4) “Within three months;” 5) “Within six to twelve months;” and 6) “Have not yet returned to work.”

Question 2 assessed the participants’ present work and benefit situation, using a list of eleven statements: 1) “I am working, mainly or partly;” 2) “I am on sick leave, mainly or partly;” 3) “I participate in work preparatory training;” 4) “I participate in rehabilitation;” 5) “I receive work assessment allowance;” 6) “I take education;” 7) “I am active job seeker;” 8) “I receive disability benefit;” 9) “I have applied for disability benefit;” 10) “Other measures. Specify: ...;” and 11) “Other allowances. Specify: ...” The participants were told to mark all the statements that were true about their present situation.

Question 3 assessed the participants’ main source of income, using the categories: 1) “ordinary salary;” 2) “sick leave benefit;” 3) “work assessment allowance;” and 4) “Other.”

Question 4 measured whether or not the participants were employed: “Are you currently employed?” The respondents were given the alternatives: “yes” or “no.”

Work ability

One question, the first item from Work Ability Index⁵⁷ was used to measure the participants’ work ability: “Current work ability compared with the lifetime best.” Possible responses ranged from 0 “completely incapable to work” to 10 “My best work ability ever.” The item is being termed “work ability score,” and is reported to validly measure work ability of people on long-term sick leave⁵⁸ and workers.⁵⁹

QOL

A single-item measure, named Cantrils’ ladder,⁶⁰ the here and now dimension, was used to measure the participants’ QOL. The scale is depicted as a ladder, and the participants were asked to rate their sense of present wellbeing, ranging from 1 “Worst possible life,” marking the bottom of the

ladder, to 10 “Best possible life,” marking the top of the ladder. The Cantrils’ ladder is considered a general scale with good psychometric properties.⁶¹

Education

One question assessed education level: “Please tick in the appropriate box your highest education completed.” Possible responses were: 1) “Did not complete primary school,” 2) “Primary school,” 3) “High school,” 4) “University bachelor degree or lower,” or 5) “University master degree or higher.” In all analyses, the variable “education” was dichotomized between high education (university level) and low education (high school or lower).

Sick-leave length

The variable “sick-leave length” quantified whether or not the participants at the beginning of the MVRP received a sickness benefit. The vocational enterprise had information about this on file, and we received this information from their database. Participants not entitled to sickness benefit have either been on sick leave more than 1 year, or they have not obtained the entitlement because they have not been in an ordinary job for 4 weeks or more. In this study, most participants without sickness benefit received work assessment allowance.

Time from intervention

To assess time from intervention, the participants were asked: “When did you participate in the MVRP at the vocational enterprise?” Possible responses were “Spring” or “Autumn” and “Year.”

Statistical analyses

Data were analyzed using SPSS (IBM Corporation, Armonk, NY, USA) for Windows (version 19.0). Frequency, percentage, mean value, and standard deviation were calculated for continuous and categorical variables. A *P*-value of <0.05 was considered statistically significant. The reliability of the scales was assessed by calculating Cronbach’s alpha coefficient. A global mindfulness score (FFMQ global) was calculated by adding up the five facets of mindfulness and dividing the sum by five. To test whether there were significant differences between groups in any facet of FFMQ, independent *t*-tests were performed.

The dichotomous variable RTW was created based on responses to “Present work and benefit situation.” Participants were categorized into two groups: “returned to work” or “not returned to work.” Work status and source of income in the sample indicated a complexity in benefit

systems and work activity, important in differentiating RTW rates. In this study, only the participants reporting ordinary salary as main income were defined as “returned to work” (N=38). Participants who reported receiving work assessment allowance or disability benefit as their main income were defined as “not returned to work” (N=42), even if they were in work-related activity or education. One participant reported working 30% in an ordinary job, receiving work assessment allowance as main income, and was categorized in the group “returned to work.”

Direct logistic regression was performed to assess the impact of mindfulness on the likelihood that respondents would report that they had returned to work. Preliminary analyses were conducted to ensure no violation of the assumptions of normality, linearity, multi-co-linearity, and homoscedasticity. The initial selection of potential independent predictors to the model were selected by entering one variable at a time in the logistic regression analysis, and were accepted if *P*<0.20. The five facets of mindfulness were tested for inclusion in the model. Moreover, previous research has identified associations between RTW and age,⁶² sex,⁶³ education,⁶⁴ work ability,¹⁹ time from intervention, and sick-leave length,⁶⁵ and these variables were also tested for inclusion in the model as potential covariates. Seven independent variables were ultimately accepted in the final model: FFMQ observation, FFMQ describe, FFMQ act aware, work ability, education, time from intervention, and sick-leave length.

To explore whether the construct of mindfulness influenced RTW rates differently in the “high education” group and in the “low education” group, logistic regression analysis was performed with the sample stratified on high/low education level. The model contained three independent mindfulness variables: “FFMQ observation,” “FFMQ describe,” and “FFMQ act aware.”

Hayes’⁴⁶ macro-application “Process” for SPSS was used to test the hypothesized model (Figure 1) examining indirect, direct, and total effects. “Process”⁴⁶ uses a regression-based approach for estimating various effects of interest in mediation, moderation, and conditional process analysis. Conceptual model number 4 (Appendix A in Hayes’⁴⁶ “Process”) was used to examine the hypothesized simple mediator model (Figure 1) in this study. This procedure generates indirect, direct, and total effects in a simple mediator model,⁶⁶ with the inclusion of covariates. “Process”⁴⁶ produces bootstrap estimates and bias-corrected (BC) confidence intervals (CIs) for the indirect effect. Moreover, a BC CI that does not cross zero indicates a statistically significant indirect

effect. In this study, a 95% CI was constructed on the basis of 5,000 bootstrap estimates. In addition to normal theory regression procedures, Preacher and Hayes⁶⁷ recommend a BC bootstrapping technique to examine the indirect effects. The bootstrapping method has great power to detect significant indirect effects, even in small samples, since the method does not rely on the assumption of a normally distributed total and indirect effect. Preacher and Hayes⁶⁷ technique and argumentation allow that X can exert an indirect effect on Y through M in the absence of an association between X and Y .⁶⁸ In this case, it is recommended that the term “mediator” be avoided and instead call it X 's indirect effect on Y through M .⁶⁶ Indeed, Hayes⁶⁸ advocates to not require a significant total effect before proceeding with tests of indirect effects, since a failure to test for indirect effects in the absence of a total effect might lead researchers to miss potentially interesting and important information.

In this study, the variable “work ability” was used as the dependent variable in the analysis examining the indirect effect of mindfulness on work ability through QOL.

In the direct logistic regression analysis, measuring the impact of mindfulness on RTW, work ability was used as a covariate.

There were no missing data in the two dependent variables RTW and work ability, or in the independent variables QOL, sex, age, and time from intervention. Missing data in the five independents (mindfulness sub-scales), sick-leave length, and length of education varied from 1.3% to 3.8%. Missing data were found to be MCAR (missing completely at random) with Little's test ($P=0.999$). Before computing the five mindfulness scales, mean estimates of missing values were calculated from available data and inserted in place of the missing values. In cases where more than two items in a scale were missing, mean calculations were not performed, and the case was considered as missing (one case).

Results

In Table 1, basic sample characteristics are presented. About half, 47% (38 participants), of the sample reported having returned to ordinary work and receiving ordinary salary as

Table 1 Basic characteristics of present sample (N=80)

Characteristic	Total (N=80)	Working sample (N=38)	Nonworking sample (N=42)	
	N (%)		Work-related activity (N=24)	No activity (N=18)
Age				
Mean ± SD	47.0±9.3	48.3±8.6	46.0±8.0	45.7±12.1
Range	24–66	30–63	31–66	24–64
Sex				
	80			
Males	7 (9)	2 (5)	2 (8)	3 (17)
Females	73 (91)	36 (95)	22 (92)	15 (83)
Work/activity				
In work, partly or mainly	38 (48)	38	0	0
Present sick leave	5 (6)	2	2	1
Work preparatory training	13 (16)	0	13	0
Student/educating	10 (10)	4	6	0
Vocational rehabilitation	4 (5)	0	4	0
Job-seeker, active	8 (10)	0	8	0
Education				
Low education (primary school/high school)	40 (52)	12 (32)	18 (75)	11 (61)
High education (university, bachelor or lower/master+)	38 (48)	26 (68)	5 (21)	7 (39)
Main income source				
Ordinary salary	36 (45)	36 (95)		
Work assessment allowance	35 (44)		23 (96)	12 (67)
Other (disability pension, apprentice)	8 (10)	2 (5)	1 (4)	5 (28)
Civil status				
Single	5 (6)	2 (5)	1 (4)	2 (12)
Live with partner	58 (73)	30 (79)	15 (62)	13 (72)
Widow/widower	3 (4)	1 (3)	1 (4)	1 (6)
Divorced/separated	14 (18)	5 (13)	7 (29)	2 (11)
Currently employed				
Yes	45 (56)	38 (100)	6 (25)	1 (6)
No	35 (44)	0	17 (71)	17 (94)

Abbreviation: SD, standard deviation.

their main income. The other half, 53% (42 participants), had not returned to ordinary work, and reported receiving work assessment allowance or disability benefit as their main income.

Means, standard deviations, reliability, and correlations between variables in the study are presented in Table 2. All facets of mindfulness correlated significantly with QOL. The FFMQ global had a moderate correlation with RTW. The “returned to work” group (N=37, mean 27.7, SD 2.9) scored significantly higher at FFMQ global (Hedge’s $g=0.47$, CI 0.02–0.92), compared with the “not returned to work” group (N=42, mean 26.0, SD 4.1). According to Cohen,⁶⁹ this may indicate a medium effect size.

RTW

Logistic regression analysis was performed to assess the direct impact of mindfulness on the likelihood that respondents returned to work (Table 3). The full model containing all predictors was significant, indicating that the model distinguished between working and nonworking respondents. None of the independent mindfulness variables “observe,” “describe,” and “act aware” made a unique statistically significant contribution to the model. In this study, the significant predictors for RTW were the covariates “work ability” (odds ratio [OR] 2.0, CI 1.41–2.90) and “education level” (OR 6.4, CI 1.56–26.47).

However, when the data were analyzed stratified by education level (Table 4), the “observation” facet of mindfulness made a significant contribution to the model (OR 1.28, CI 1.03–1.59) for “high educated” participants. The model contained three independent mindfulness variables, “observation,” “describe,” and “act aware,” and was significant for the “high educated” individuals, indicating that

the model distinguished between working and nonworking respondents in this group.

Bootstrapping analysis examining the indirect effect of mindfulness on RTW through QOL revealed that the model explained 30% of the variance in RTW. As Table 5 shows, mindfulness positively predicted QOL (path a). Moreover, QOL positively predicted RTW (path b). The model also displayed a non-significant total effect (path c) of mindfulness on RTW. When investigating the indirect effect of mindfulness on RTW through QOL, the BC CI did not cross zero. This proposes an indirect effect of mindfulness on RTW through QOL. That is, a higher level of mindfulness predicted increased QOL, which in turn predicted successful RTW. The covariate “education” also individually predicted successful RTW. That is, individuals who reported a higher level of education also typically reported successful RTW.

Work ability

Bootstrapping analysis investigating the indirect effect of mindfulness on work ability through QOL, revealed that the model explained 30% of the variance in work ability. Table 5 shows that mindfulness positively predicted QOL (path a). Moreover, QOL positively predicted work ability (path b). The model revealed a non-significant total effect (path c) of mindfulness on work ability. However, when investigating the indirect effect of mindfulness on work ability through QOL (path ab), the BC CI did not cross zero. This proposed an indirect effect of mindfulness on work ability through QOL. Namely, a higher level of mindfulness predicted a higher level of QOL, which in turn predicted a higher level of work ability. The covariate “sick-leave length” also individually predicted successful RTW.

Table 2 Correlations, means, standard deviations, and reliability of all study measures (N=80)

Variable	1	2	3	4	5	6	7	8	9
1. FFMQ observe	–	0.60 ^a	0.09	–0.03	0.54 ^a	0.65 ^a	0.21	0.17	0.37 ^a
2. FFMQ describe		–	0.41 ^a	0.19	0.55 ^a	0.83 ^a	0.17	0.10	0.41 ^a
3. FFMQ act aware			–	0.48 ^a	0.18	0.64 ^a	0.15	0.13	0.37 ^a
4. FFMQ nonjudge				–	0.15	0.56 ^a	0.14	0.14	0.31 ^a
5. FFMQ nonreact					–	0.69 ^a	0.11	0.08	0.38 ^a
6. FFMQ global						–	0.23 ^b	0.19	0.54 ^a
7. Return to work							–	0.61 ^a	0.39 ^a
8. Work ability								–	0.45 ^a
9. Quality of life									–
Mean	28.7	29.7	26.6	27.2	21.8	26.8		6.4	7.0
SD	5.6	6.2	4.9	6.1	4.4	3.7		2.7	1.7
α	0.84	0.87	0.82	0.87	0.74	0.90			

Notes: Mindfulness (FFMQ) subscales: for the nonreact facet, possible range of scores is 7–35. For all other facets, possible range is 8–40. Return to work, work ability, and quality of life are all single-item measures. ^a $P<0.01$; ^b $P<0.05$.

Abbreviations: FFMQ, Five Facet Mindfulness Questionnaire; SD, standard deviation.

Table 3 Logistic regression analysis for variables predicting work reentry (N=75)

Variable	Work reentry				
	B	SE	OR	P	95% CI
Work ability	0.71	0.18	2.03	0.01 ^a	1.41–2.90
Sick-leave length	0.54	0.91	1.71	0.55	0.29–10.12
Education	1.86	0.72	6.43	0.01 ^a	1.56–26.47
Time	0.45	0.35	1.56	0.21	0.78–3.14
Observation	0.07	0.09	1.07	0.47	0.89–1.28
Describe	–0.04	0.08	0.96	0.63	0.83–1.12
Act aware	0.07	0.09	1.07	0.46	0.90–1.27

Notes: R²=0.47 (Cox & Snell), 0.63 (Nagelkerke); Model X²(7) =48.0, P<0.01; 1= in work; 0= not in work. ^aP<0.01.

Abbreviations: B, unstandardized beta coefficient; CI, confidence interval; OR, odds ratio; SE, standard error of B.

Discussion

This study investigated how mindfulness predicts work reentry. The major finding of the study was the identification of an indirect effect of mindfulness on both RTW and work ability through QOL, supporting the mediation part of the hypothesized model. Mindfulness training may enhance QOL, which in turn may affect work ability and RTW positively. The present findings partially replicate previous research demonstrating a positive relationship between mindfulness and QOL (path a)²⁴ and a positive relationship between QOL and RTW (path b) (Table 5).^{21,70} Moreover, the present research expands on these previous findings by identifying QOL as a possible mechanism by which mindfulness is positively associated with work ability and RTW.

As can be seen in Table 5, there was no total effect (path c) of mindfulness on RTW or work ability. This finding was confirmed in the direct logistic regression analysis examining whether some of the five facets of mindfulness predicted RTW. Results from logistic regression analysis (Table 3) revealed no significant differences in level of mindfulness among the participants who had returned and those who had not returned to work after long-term sick leave. This result was somewhat surprising, since mindfulness training is effective in treating depression and anxiety,^{35,36} and pain,³⁸ health conditions that cause the majority of long-term sick

leave,^{2,3} it was hypothesized that the level of mindfulness would be found to be higher among individuals who had returned to work – assuming health complaints had caused the absence from work. However, the finding underlines the complexity in this multifactorial phenomenon RTW. In the present study, factors being controlled for, work ability and education level, emerged in the forefront and were strong predictors of work reentry.

According to Hayes,⁶⁸ the fact that *X* (mindfulness) can exert an indirect effect on *Y* (RTW) through *M* (QOL) in the absence of a direct association between *X* and *Y* becomes understandable when considering that the total effect is the sum of various direct and indirect paths of influence, not all covered in the formal model. For example, two or more indirect paths which carry the effect from *X* through *Y* might operate in opposite directions, and in the statistical analysis, two or more indirect effects with opposite signs can cancel each other out and produce a non-significant total effect, despite the presence of indirect effects that are not zero.⁶⁸ In a complex and multifactorial context like RTW,^{16,17} one must assume many indirect paths operating in opposite directions. Failure to test for indirect effects in the absence of a total effect could have led us to miss important information regarding mechanisms by which mindfulness exerts effects on RTW and work ability.

Work ability operated as covariate in the direct logistic regression analysis and emerged as a strong predictor for successful RTW (Table 3). In other words, individuals who had successfully returned to work typically reported a higher level of work ability than individuals who had not yet returned to work. This finding is consistent with results from the study by Braathen et al,¹⁹ who found that successful RTW 4 months after an MVRP was predicted by good work ability at baseline and improved work ability at follow-up. Moreover, the covariate “education level” also predicted successful RTW in this sample (Table 3). Participants with a university education level were more likely to report they had returned to work than participants with lower education level. This may indicate that marginalization in the labor

Table 4 Logistic regression analysis for mindfulness variable predicting work reentry, with the data stratified on education (N=78)

Variable	High education ^a (N=38)					Low education ^b (N=40)				
	B	SE	OR	P	CI	B	SE	OR	P	CI
Observation	0.25	0.11	1.28	0.03 ^c	1.03–1.59	–0.06	0.09	0.94	0.53	0.78–1.34
Describe	–0.21	0.12	0.70	0.07	0.64–1.02	0.10	0.08	1.10	0.25	0.93–1.30
Act aware	0.24	0.13	1.27	0.07	0.98–1.64	–0.01	0.07	0.92	0.92	0.86–1.14

Notes: R² high education =0.19 (Cox & Snell), 0.27 (Nagelkerke); Model high education X²(3) =8.3, P<0.05; R² low education =0.04 (Cox & Snell), 0.05 (Nagelkerke); Model low education X²(3) =1.7, P>0.05; 1= in work; 0= not in work. ^aHigh education = university level; ^blow education = high school or lower; ^cP<0.05.

Abbreviations: B, unstandardized beta coefficient; CI, confidence interval; OR, odds ratio; SE, standard error of B.

Table 5 Mediation analysis for mindfulness on RTW and work ability through QOL (N=75)

	RTW			Work ability						
	Coeff	SE	NT P	BC 95% CI		Coeff	SE	NT P	BC 95% CI	
				Lower	Upper				Lower	Upper
FFMQ global (IV)										
IV to M (path a)	0.27	0.00	<0.01			0.27	0.05	<0.01		
Total effect (path c)	0.04	0.08	0.61			0.05	0.09	0.55		
Direct effect (path c')	-0.11	0.10	0.29			-0.11	0.09	0.23		
Quality of life (M)										
Direct effect (path b)	0.70	0.25	<0.01			0.67	0.19	<0.01		
Indirect effect (path ab)	0.18	0.13		0.03	0.45	0.18	0.08		0.04	0.37
Partial effect of CV										
Education	1.94	0.62	<0.01			0.92	0.58	0.11		
Sick-leave length	1.25	0.84	0.14			1.59	0.72	0.03		
Time from intervention	0.24	0.28	0.40			-0.14	0.28	0.62		
Model summary (R ²)			0.30 (<0.01)					0.30 (<0.01)		

Note: Dependent variables are RTW and work ability.

Abbreviations: BC, bias-corrected; CI, confidence interval; Coeff, point estimate of effects; CV, covariates; FFMQ, Five Facet Mindfulness Questionnaire; IV, independent variable; M, mediator; NT P, normal theory P-value; QOL, quality of life; RTW, return to work; SE, standard error of the point estimate.

market is an underlying problem for the individuals who had not yet returned to work. As shown in Table 1, most of the nonworking sample was in work-related activity. They were able to work, but had not yet entered the labor market. It has earlier been confirmed that people with a low education level need more time to return to work fully.⁶⁴ Mindfulness training alone is unlikely to help “low educated” people to quickly re-enter the labor market. However, descriptive results (Table 1) indicate that 10% of the participants were in education at follow up, indicating that the MVRP has contributed to facilitating and encouraging further education. The Organisation for Economic Co-operation and Development (OECD) recommends prioritizing skill development for people with low education.⁷¹

As Table 5 shows, the covariate “sick-leave length” was a significant predictor for work ability. Since reduced self-reported work ability is claimed to receive work assessment allowance for people who have been out of work more than 1 year, it was expected that this variable would give a significant contribution to the model.

Our findings are in line with earlier studies reporting people who had returned to work having a shorter sick-leave length and a job to which to return.⁶² Long history of sickness absence did strengthen all other prognostic factors for non-RTW.^{65,72} Almost one-fifth of the Norwegian population receive income supports due to health problems – nearly everybody who is not working.⁷³ Moreover, Brage and Hernes⁷⁴ argue that the OECD in several publications claims that people in Norway are excluded from the labor market by giving them a certification as either sick or disabled. Norway has a generous social protection system, and for many individuals, this welfare-driven

strategy has the contrary effect of inequality and exclusion.⁷¹ Secker et al⁷⁵ identified barriers to employment for people with mental health problems, and found the fear of losing benefits, and fear that leaving benefits for a paid job would not be financially worthwhile, as major barriers to employment. The OECD argues that relatively easy access to long-term sick leave plays to characteristics of mental disorders, like withdrawal and passivity, and thereby excludes individuals from the labor market.⁷¹ To optimize the efficiency of vocational rehabilitation measures, the OECD recommends defining “rehabilitative program packages for relevant target groups.”⁷¹ There is a need for research that investigates not only whether a rehabilitation measure has an effect, but also for whom it has an effect.

Our data suggest that for participants with a university education, mindfulness partially predicts work reentry (Table 4), and the observation facet of mindfulness is significant. Perhaps participants who have not yet returned to work have their attention focused elsewhere, preoccupied with thoughts and worries about being unemployed, pulling their focus away from observing what happens in the moment. The observing facet of mindfulness consists of noticing or attending to a variety of internal or external phenomena (eg, bodily sensations, cognitions, emotions, and sounds); perhaps people can more easily be mindful after they feel better.⁷⁶ It has earlier been confirmed that individuals who had returned to work after an MVRP experienced higher QOL compared with the sick-listed individuals.²¹

Limitations

This study builds on data from persons referred to an existing governmental funded program by local labor and

welfare offices. The MVRP was driven by a local vocational rehabilitation enterprise, where the main shareholder is the local municipality. There are limitations to the interpretation of the data. The primary limitation of the present study is the cross-sectional research design. As such, a temporal relationship between mindfulness, QOL, and RTW/work ability could not be conclusively established. This study employed a cross-sectional design and can therefore not provide clear indices of causality direction, ie, whether they are more mindful because they are back at work, or whether higher mindfulness increases the probability of successful RTW. To investigate whether mindfulness training results in higher mindfulness skills for this population, and whether these enhanced mindfulness skills translate to increased probability for RTW, requires a prospective controlled design. The retrospective assessment of the RTW outcome might limit the accuracy of the time to RTW estimate. However, baseline data included information about age, sex, the exact time each participant completed the intervention program, and whether or not the participant had been entitled to a sickness benefit at the start of the program. When analyzing the data, “time from intervention” was controlled for. We did not influence the assignment of persons to the program, so the design lacks strict randomization. However, the participants represent all participants seen over a period of time, and all participants had completed the rehabilitation program. Because of a relatively small number of participants (N=80), it is possible that generalization from the findings in the study is limited. The population sampled in this study were all on long-term sick leave, therefore generalizability to other samples and settings is limited.

Conclusion

The current research demonstrates the importance of testing for indirect effects in the complex context of RTW. Rehabilitation programs including mindfulness are increasingly used to treat many of the psychological and physical conditions that are associated with long-term sick leave, but there is a lack of research evidence on the connection between mindfulness training as an intervention and increased work ability and RTW. The data in the present study give evidence on the usefulness of mindfulness applied in the context of RTW, suggesting that mindfulness is indirectly related to both RTW and work ability through QOL. Moreover, for “high educated” participants, the observation facet of mindfulness significantly predicted RTW. The covariates “work ability” and “education level” significantly predicted RTW. An enhancement of education level and qualification

for the labor market should be of highest priority for “low educated” people receiving work assessment allowance. How mindfulness might enhance and mediate work ability in a vocational rehabilitation process should be investigated in an experimental design study.

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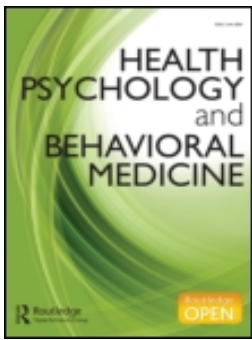
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Paper II



What distinguishes responders from nonresponders to a vocational rehabilitation program?

Solveig Vindholmen, Tommy Haugen, Rune Høigaard & Stephen Seiler

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What distinguishes responders from nonresponders to a vocational rehabilitation program?

Solveig Vindholmen*, Tommy Haugen, Rune Høigaard and Stephen Seiler

Faculty of Health and Sport Sciences, University of Agder, Service Box 422, 4604 Kristiansand, Norway

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Objective: The aim of the present study was to compare responders and nonresponders in terms of work ability (WA) to a multidisciplinary vocational rehabilitation program (MVRP) in Norway. *Methods:* The WA of 74 participants was tested at baseline and in the final week of a 4–6-week intervention. The participants whose WA increased were defined as WA-responders, whereas participants with no increases or with decreases in their WA after the intervention were defined as WA-nonresponders. Measures of functional health, psychological functioning, and demographics were also collected. *Results:* Overall, the results of this study indicate that the WA improved and the proportion of participants with poor WA decreased by 26% after the intervention. However, the main outcome of this study was that not all of the participants reported improved WA after the intervention. WA of 43% of the participants did not improve and they were defined as WA-nonresponders, whereas the WA of the other 57% participants improved and they were defined as WA-responders. At baseline, the two groups did not differ significantly in terms of their basic characteristics, whereas there were significant differences between the two groups in terms of pain intensity and sense of mastery variables. Logistic regression analysis identified pain intensity and sense of mastery as significant predictors of WA-response. *Conclusion:* Multidisciplinary vocational rehabilitation seems effective for some but not all participants. Unfavorable WA responses were more prevalent in participants who reported high pain intensity and low sense of mastery at baseline. It is still a challenge to understand what distinguishes responders from nonresponders to MVRPs; thus, further research is required.

Keywords: multidisciplinary; responder; return to work; vocational rehabilitation; work ability

Introduction

Long-term sick leave is a major problem in industrialized countries, where it incurs substantial costs and burdens for individuals, employers, and society (Bryngelson, 2009; Gabbay et al., 2011). The majority of long-term sick leave and disability is associated with musculoskeletal disorders and mild-to-moderate mental health problems such as stress, depression, burnout, and anxiety (Brage, Ihlebaek, Natvig, & Bruusgaard, 2010; Gabbay et al., 2011; OECD, 2013; Toppinen-Tanner, Ojajärvi, Väänänen, Kalimo, & Jäppinen, 2005), and comorbid unexplainable pain conditions often occur (Chandler, Ciccone, MacBride, & Natelson, 2008). Vocational rehabilitation is being used increasingly to reduce sick leave in Norway (OECD, 2013). The overall goal of

*Corresponding author. Email: solveig.vindholmen@uia.no

vocational rehabilitation is to improve work ability (WA) (Kuoppala & Lamminpää, 2008), thereby preparing individuals on long-term sick leave for a full return to work (RTW) (Ilmarinen, Tuomi, & Seitsamo, 2005). The context of RTW is complex (Øyeflaten, Lie, Ihlebæk, & Eriksen, 2013) and the factors related to successful RTW are likely to vary across different types of health, individual, work, and social context characteristics (Huijs, Koppes, Taris, & Blonk, 2012). Accordingly, individuals referred to vocational rehabilitation are heterogeneous. They exhibit high comorbidity of psychiatric and somatic diagnoses, but often with no or few objective medical explanations (i.e. subjective health complaints (SHCs)) (Huijs et al., 2012; Oyeflaten, Hysing, & Eriksen, 2008; Salmi et al., 2009).

Multidisciplinary interventions have been reported to be more efficacious and cost-effective in increasing RTW compared with single modality interventions across diagnoses (Gabbay et al., 2011; Hillage et al., 2008; Holm et al., 2010; Norlund, Ropponen, & Alexanderson, 2009). However, the majority of these randomized controlled trials studied musculoskeletal conditions, whereas very few studies have measured the impact of vocational rehabilitation on mild-to-moderate mental health problems (Hillage et al., 2008; Holm et al., 2010). Some previous studies (Haldorsen et al., 2002; Skouen & Kvåle, 2006) have shown that multidisciplinary interventions are beneficial and cost-effective for individuals with a poor RTW prognosis, whereas individuals with a good RTW prognosis did equally well with ordinary treatment. It has been suggested that classifying individuals into more homogeneous groups of responders to the different interventions will improve the vocational rehabilitation process and the effects of interventions (Bergström, Bergström, Hagberg, Bodin, & Jensen, 2010; Haldorsen et al., 2002; Skouen & Kvåle, 2006; Waddell, Burton, & Kendall, 2008; Watzke, Galvao, Gawlik, Huehne, & Brieger, 2006). Unfortunately, we still lack knowledge about who benefits from different types of intervention and whether intervention duration and/or intensity are important (Waddell et al., 2008). In Norway, many sick-listed individuals are subjected to various vocational rehabilitation measures, but some do not successfully achieve RTW (Hernes, 2010). Therefore, it is important to identify the risk factors for unsuccessful responses to different interventions, thereby better matching appropriate assistance to need in the vocational rehabilitation process. For a heterogeneous group of individuals, successful RTW after a multidisciplinary vocational rehabilitation program (MVRP) was predicted by good WA at baseline and improved WA at follow-up (Braathen, Veiersted, & Heggenes, 2007). However, it is unclear whether all individuals benefit equally from MVRPs in terms of improved WA and little is known about what distinguishes program responders from nonresponders.

Previous studies identified pain as a predictor of poor WA and unsuccessful RTW (Dekkers-Sánchez, Hoving, Sluiter, & Frings-Dresen, 2008; Dekkers-Sánchez, Wind, Sluiter, & Frings-Dresen, 2013; Neupane, Miranda, Virtanen, Siukola, & Nygård, 2011). The cognitive impairment associated with pain appears to be a major obstacle to rehabilitation (Moriarty, McGuire, & Finn, 2011). Furthermore, individual differences in perceived control are related to a variety of positive outcomes, including vocational rehabilitation, health, achievement, motivation, self-esteem, and coping (Millet, 2005; Selander, Marnetoft, & Åsell, 2007; Skinner, 1996). Generally, conceptualized perceived control or sense of mastery refers to an individual's generalized expectancies or beliefs about the extent to which they regard their life chances and things that happen to them as being under their own control in contrast to being fatalistically ruled (Pearlin & Schooler, 1978; Rotter, 1966). Sense of mastery and self-esteem are viewed as important coping resources with the capacity to regulate stressful events (Pearlin, Lieberman, Menaghan, & Mullan, 1981; Pearlin & Schooler, 1978), while chronic stress syndrome, burnout, predicts future sick leave (Toppinen-Tanner et al., 2005).

The MVRP studied here is located in southern Norway, and is offered to people on sick leave, and other users of the local Norwegian Labor and Welfare Administration (NLWA) when reporting poor WA. The program is funded by the NLWA and the provider is a local vocational rehabilitation

enterprise. The MVRP aims to facilitate more autonomous behavior, thereby improving the WA of participants (Haavorsen et al., 2009). Mindfulness training in the form of mindfulness-based stress reduction (Kabat-Zinn, 1990) is a core component of the program and a recent study of this particular MVRP suggests that mindfulness may enhance RTW and WA through improved quality of life, while mindfulness was also a significant predictor of RTW for highly educated participants (Vindholmen, Høigaard, Espnes, & Seiler, 2014). Thus, WA is valuable for predicting successful RTW (Braathen et al., 2007), and professional and correct advice from RTW stakeholders is important for supporting RTW (Dekkers-Sánchez et al., 2013; Wåhlin, Ekberg, Persson, Bernfort, & Öberg, 2013). However, MVRPs are expensive and, to the best of our knowledge, there have been no previous examinations of responders and nonresponders to this specific type of vocational rehabilitation in terms of WA. Therefore, the aim of this study was to identify WA-responders and -nonresponders after an MVRP and to compare the key characteristics of these two groups, thereby identifying the individuals who are most likely to benefit from this type of intervention by increasing their WA after the program. Thus, the aim of the present study was to determine what distinguishes WA-responders and WA-nonresponders at baseline before being subjected to an MVRP. It was hypothesized that nonresponders would have significantly higher scores in terms of pain intensity and pain consequences, whereas responders would have significantly higher scores in terms of sense of mastery and self-esteem.

Methods

Participants

The participants in this prospective cohort study comprised 74 individuals aged 23–59 years (mean (SD) age = 41 (9) years). All of the participants completed a 4- or 6-week MVRP at a modern vocational enterprise in southern Norway. The dropout rate from pretest to posttest was 9%, that is, three participants dropped out from the entire program and six participants dropped out only from the study. The typical professions of the participants were nurses, auxiliary nurses, milieu therapists, teachers, kindergarten assistants/preschool teachers, secretaries, and blue-collar workers. The common diagnoses in the sample were depression, musculoskeletal disorders, burnout, stress, fibromyalgia, anxiety, chronic fatigue syndrome, and combinations of these diagnoses.

The group intervention program

The sample participated in an MVRP, which included both individual counseling and group-based treatment. Participants were assigned to the MVRP by the NLWA, which also decided the program's duration. The participants attended approximately 6 hours per day on 3 days per week, and most of the participants attended for 6 weeks, although the NLWA only assigned some participants for 4 weeks. The difference in the program's duration was determined by the NLWA, and based on the participant's motivation to continue in the program. The MVRP is led by an interdisciplinary team (e.g. nurses, physiotherapist, teachers, sport pedagogue, and occupational therapists), specially trained in mindfulness and delivery of the Vitality Training Program (VTP) (Haugli & Steen, 2001; Steen & Haugli, 2000). The content of the MVRP covered three categories: education, physical activity, and individual counseling.

Educational program

The educational program is based on the VTP (Haugli & Steen, 2001; Steen & Haugli, 2000), which was mindfulness-based intervention, originally developed for people with chronic

muscle-skeletal pain (Haugli & Steen, 2001; Steen & Haugli, 2000) and built on (a) gestalt theory (Pearls, 1969) and confluent education methods (Brown, 1971); (b) mindfulness (Kabat-Zinn, 1990); (c) a phenomenological understanding of the body (Merleau-Ponty, 2002); and (d) the psychology of personal constructs (Kelly, 1991; Nygard & Kunszenti, 1999). Mindfulness training was taught both as formal meditation exercises lasting from 5 to 20 minutes, such as sitting meditation and mindful movements, and as informal meditation exercises, such as being present in everyday activities. Mindfulness-based exercises were used methodically to facilitate the participants' awareness of the close relationship between thoughts, emotions, and bodily reactions. Various creative exercises, such as guided imagery, drawing, music, and metaphors, were used to facilitate experiential learning processes. The focus of the MVRP is to help participants change their focus from pain and disability to personal resources and potentials, as well as teaching them new coping strategies and helping them to become more self-confident.

The educational program also covers topics such as lifestyle and work-related issues. For an overview of the specific topics addressed in each session, see Table 1.

Physical activity

The physical activities applied in the program emphasized the development of core stability, body awareness, balance, functional strength, and overall endurance and strength. The participants

Table 1. Topics addressed in the group-sessions.

Week 1	Session 1	A: Introduction and information. Familiarizing. Decide group values B: Basic physical training; strength, balance, and endurance
	Session 2	A: "What is good health for me?" My health now and wishes for the future B: Mindfulness training
Week 2	Session 3	A: Rights and duties in working life. Working environment act. IA agreement B: Psychomotor physiotherapy group training
	Session 4	A: VTP topic – "If my body could talk ..." B: Basic physical training; strength, balance, and endurance
Week 3	Session 5	A: Pain and pain coping/stress and stress coping B: Yoga and body scan
	Session 6	A: VTP topic – "What do I need?" Strengthening of their inner voice by use of a rosebush as a metaphor B: Basic physical training; strength, balance, and endurance
Week 4	Session 7	A: VTP topic – "Who am I?" focusing on personal values and recourses B: Psychomotor physiotherapy group training
	Session 8	A: "What do I want, and where am I now in relation to my goal?" How to make a good and realistic action plan B: Basic physical training; strength, balance, and endurance
	Session 9	A: Mindfulness training
Week 5	Session 10	A: VTP topic – awareness and accept of the "polarities" (e.g. I can be both smiling and I can be angry; sometimes self-confident and sometimes insecure; sometimes week and sometimes strong) B: Yoga and body scan
	Session 11	A: VTP topic – "Personal recourses, possibilities and choices" B: Basic physical training; strength, balance, and endurance
	Session 12	A: Mindfulness training
Week 6	Session 11	A: Motivation "How to be aware of, take care of and maintain progress?" B: Psychomotor physiotherapy group training
	Session 12	A: Evaluation B: Basic physical training; strength, balance, and endurance

Note: A = educational program, program before lunch; B = physical activity, program after lunch; VTP topic = topic adopted from the Vitality Training Program (Haugli & Steen, 2001; Steen & Haugli, 2000).

were introduced to hatha yoga, basic strength and endurance training, cycle ergometer spinning, and psychomotor physiotherapy. Through the physical activities in the MVRP, individuals are encouraged to discover new experiences and become more aware of themselves and their body. In all physical activities and exercises, the individuals are given opportunities to become familiar with their own limits, physical, psychological, and social, and gradually experience that they are able to extend their own limits and enhance their capacity. See [Table 1](#) for an overview of the physical group activities.

Individual counseling

Participants were offered individual counseling based on cognitive behavior therapy (CBT), which addresses the close relationship between cognition, emotion, and behavior (Farmer & Chapman, 2008), every second week (three meetings in total) as well as one individual counseling session with psychomotor physiotherapy (Braatøy, 1947; Sviland, Råheim, & Martinsen, 2012). Moreover, the participants were offered assistance to communicate their needs to their employer (for employed participants) or to the NLWA (for unemployed participants).

Procedure

This study was approved by the Norwegian Social Science Data Services and the National Ethics Committee – Health Region South. Inclusion criteria included attending to the MVRP in the time period August 2011–August 2012. All individuals who participated in the MVRP in the given time period were invited to participate in the study ($N = 119$). Confidentiality was emphasized and all of the participants were volunteers who gave their written informed consent to participate in this study. Informed consent was documented by the use of a written consent form approved by the Norwegian Social Science Data Services and signed by the subject. In total, 83 individuals accepted the invitation and 74 individuals completed both the pretest and posttest (9% dropped out). There were no significant differences in the basic demographics characteristics (i.e. age and sex) of the participants and nonparticipants (nonparticipants comprised 30 women and 6 men aged 28–59 years, mean age = 41, $SD = 8$). All of the participants completed a self-reported questionnaire before and after the MVRP. The questionnaire was completed using a pen and paper, or via an internet-based version of the questionnaire (<http://www.surveymxact.com/>).

Measures

Work ability

A single item called the Work Ability Score (WAS) (Tuomi, Ilmarinen, Jahkola, Katajarinne, & Tullki, 1998) was used to measure the WA of participants, where the “current WA compared with the lifetime best” ranged from 0 (completely incapable of work) to 10 (my best WA ever). WAS is the first item in the Work Ability Index (WAI) (Tuomi et al., 1998) and the convergence in validity between WAS and WAI was shown to be statistically significant (El Fassi et al., 2013). A strong association between WAS and the complete WAI was also reported by Ahlstrom, Grimby-Ekman, Hagberg, and Dellve (2010). WAS is a valid measure of WA among individuals on long-term sick leave (Ahlstrom et al., 2010) and active workers (El Fassi et al., 2013). The WAS is further subcategorized as excellent (10 points); good (8–9 points); moderate (6–7 points); or poor (0–5 points) (El Fassi et al., 2013; Gould, Ilmarinen, & Jarvisalo, 2008).

Personal burnout

A single subscale from the Copenhagen Burnout Inventory (Kristensen, Borritz, Villadsen, & Christensen, 2005) was used for measuring personal burnout, which is defined as “the degree of physical and psychological fatigue and exhaustion experienced by the person”, p. 197. The personal burnout subscale is designed to measure burnout regardless of occupational status, that is, including the unemployed, young people, and pensioners. The personal burnout subscale comprises six items (e.g. “How often do you feel tired” and “How often do you feel weak and susceptible to illness?”). The questions are scaled on a five-point Likert-type scale that ranges from 1 (never/almost never) to 5 (always or to a very high degree). The responses were rescaled to a 1–100 metric, where high scores (≥ 50) indicated greater levels of burnout. Kristensen et al. (2005) analyzed the psychometric properties of the Copenhagen Burnout Inventory and obtained satisfactory estimates of the validity and reliability of the instrument.

Pain intensity/pain consequences

Items from the Norwegian version (Klepstad et al., 2002) of the Brief Pain Inventory (Cleeland, 2009) were used to measure pain intensity and pain consequences. Pain intensity was assessed by four items (pain now, average pain, worst pain, and least pain) using a ratings scale that ranged from 0 (no pain) to 10 (pain as bad as you can imagine). Moreover, the level of interference with function caused by pain was assessed by seven items (general activity, mood, walking ability, normal work, relations with other people, sleep, and enjoyment of life) using a scale that ranged from 0 (no interference) to 10 (complete interference). The items were aggregated into two dimensions: (1) Pain Severity Index (i.e. pain intensity), which used the sum of the four items related to pain intensity, and (2) Function Interference Index (i.e. pain consequences), which used the sum of the seven pain interference items. Psychometric support for this measure was provided by Klepstad et al. (2002) and Tan, Jensen, Thornby, and Shanti (2004).

Subjective health complaints

To assess how subjective somatic and psychological health complaints were experienced by the participants, 12 items from the SHC Inventory (Eriksen, Ihlebæk, & Ursin, 1999) were used: shoulder pain, neck pain, upper back pain, arm pain, headache, low back pain, leg pain, anxiety, sadness/depression, dizziness, stomach discomfort (digestive trouble), and chest pain. One item was added to cover more rare complaints (i.e. “other complaints”). The participants were asked to rate the severity of each complaint in the previous month using a four-point Likert-type scale that ranged from 0 (none) to 3 (severe). The total score was computed based on all of the items. Psychometric support for the measure was provided by Eriksen et al. (1999).

Sense of mastery

Sense of mastery was measured using the five-item Norwegian version (Dalgard, Mykletun, Rognerud, Johansen, & Zahl, 2007) of a scale developed by Pearlin et al. (1981). Examples of items are: “I have little control over the things that happen to me” and “There is little I can do to change many of the important things in my life.” All of the items were measured using a five-point Likert scale that ranged from 5 (strongly disagree) to 1 (strongly agree). The items were summarized into a sense of mastery score, where higher scores indicated higher levels of mastery. Psychometric support for the measure was provided by Dalgard et al. (2007).

Global self-esteem

Global self-esteem was measured by the Norwegian version (von Soest, 2005) of the Rosenberg Self-Esteem Scale (Rosenberg, 1965). The scale comprised 10 items and the participants were asked to make judgments about their own self-worth (e.g. “on the whole, I am satisfied with myself”) using four-point Likert scales that ranged from 1 (strongly disagree) to 4 (strongly agree). The summed score ranged from 10 to 40, where a higher score indicated greater self-esteem. The Norwegian version of Rosenberg’s Self-Esteem Scale has been shown to have good validity (von Soest, 2005).

Covariates. At baseline, the potential effects of modifiers were assessed, including age, gender, education (highest completed education: “high = university level” or “low = high school or lower”), and sick-leave duration (1 = 0–3 months, 2 = 4–6 months, 3 = 7–9 months, 4 = 10–12 months, 5 = more than 12 months, 6 = more than 24 months).

Statistical analysis

SPSS for Windows (version 19 and 22; IBM Corporation, Armonk, NY, USA) were used to analyze the data. WAS was rated at baseline and during the final week of the intervention. To dichotomize the WA-responders and WA-nonresponders, participants who improved by ≥ 1 unit on the 10-point WAS after the intervention were defined as WA-responders, and participants with unchanged or decreased WAS were defined as WA-nonresponders.

To test whether there were significant differences between the two groups at baseline in terms of their basic characteristics, an independent *t*-test was conducted for the variable “age” while chi-square tests were performed for the categorical variables (Table 2). Independent *t*-tests were also used to test whether there were any significant differences between the two groups at baseline in terms of the personal burnout, pain intensity, pain consequences, SHC, sense of mastery, and self-esteem variables (Table 3).

Chronbach’s alpha was used to quantify internal consistency/scale reliability.

Logistic regression analysis was conducted to assess the impact of baseline characteristics on the likelihood that participants would become WA-responders.

There were no missing data for the dependent variable WA or the independent variables, except for pain intensity and pain consequences. Data were missing for pain intensity in 2.7% of cases and for pain consequences in 1.4% of cases. The missing data were shown to be missing completely at random by Little’s test ($p = .56$). Before computing the scales, mean estimates were calculated based on the available data and used to replace the missing values. In cases where more than two items were missing from a scale, the cases were treated as missing.

Results

Response to the MVRP in terms of WA

In the total sample ($N = 74$), WAS increased significantly from pretest (mean = 3.8, SD = 2.2) to posttest (mean = 5.0, SD = 2.5), thereby indicating a medium Cohen effect size (Cohen, 1988) ($p < .01$, Hedges’ $g = 0.51$, 95% confidence interval (CI) = 0.18–0.83). Furthermore, the results indicated that the proportion of participants who reported a poor WAS (i.e. 0–5 points) decreased by 26% from pretest to posttest (77% at baseline and 57% at posttest). The proportion of participants who reported moderate-to-excellent WAS (i.e. 6–10 points) increased by 47% from pretest to posttest (23% at baseline and 43% at posttest). However, as shown in Figure 1, not all of the participants had increased WAS after the MVRP. Thus, 57% of the participants reported improvements in WAS from pretest (mean = 3.5, SD = 1.9) to posttest (mean = 6.4, SD = 1.7) and they were defined as WA-

Table 2. Basic characteristics of the participants ($N = 74$).

Characteristic	Total N (%)	WA-responders ($N = 42$)	WA-nonresponders ($N = 32$)	p
<i>Age</i>				
Mean \pm SD	41.4 \pm 9.4	39.8 \pm 8.9	43.5 \pm 9.8	.093
Range	23–59	23–56	23–59	
<i>Sex</i>				
Male	14 (18.9)	10 (23.8)	4 (12.5)	.218
Female	60 (81.1)	32 (76.2)	28 (87.5)	
<i>Work/activity</i>				
In work, partly or mainly	16 (21.6)	9	7	.963
Present sick leave	47 (63.5)	29	18	.257
Other	3 (4.1)	1	2	
<i>Education</i>				
University	26 (35.1)	14 (33.3)	12 (37.5)	.710
Not university	48 (64.9)	28 (66.7)	20 (62.5)	
<i>Main income source</i>				
Ordinary salary	17 (23.0)	9 (21.4)	8 (25.0)	.655
Sickness benefit	33 (44.6)	20 (47.6)	13 (40.6)	
Work assessment allowance	18 (24.3)	10 (23.8)	8 (25.0)	
Other	2 (2.8)	1 (2.4)	1 (3.1)	
<i>Civil status</i>				
Single	17 (23.0)	9 (21.4)	8 (25.0)	.427
Living with partner	45 (60.8)	28 (66.7)	17 (53.1)	
Widow/widower	3 (4.1)	2 (4.8)	1 (3.1)	
Divorced/separated	9 (12.2)	3 (7.1)	6 (18.8)	
<i>Currently employed</i>				
Yes	46 (62.2)	24 (57.1)	22 (68.8)	.308
No	28 (37.8)	18 (42.9)	10 (31.3)	
<i>Sick-leave duration</i>				
0–3 months	9 (12.2)	5 (11.9)	4 (12.5)	.427
4–6 months	19 (25.7)	9 (21.4)	10 (31.3)	
7–9 months	22 (29.7)	14 (33.3)	8 (25.0)	
10–12 months	3 (4.1)	3 (7.1)	0	
More than 12 months	10 (13.5)	4 (9.5)	6 (18.8)	
More than 24 months	9 (12.2)	6 (14.3)	3 (9.4)	

Note: To detect significant differences between the two groups in terms of the basic characteristics, an independent t -test was conducted for the age variable, and chi-squared tests were performed for the categorical variables; *work/activity* – other = work preparatory training, education, job seeker; *education* – university = lower or bachelor, masters+; *education* – not university = not finished primary school, primary school, or high school; *main income source* – other = disability pension, daily unemployment benefit, widow pension.

responders, whereas the remaining 43% of the sample reported no improvement, or they actually reported decreases in WAS from pretest (mean = 4.3, SD = 2.5) to posttest (mean = 3.2, SD = 2.2) and they were defined as WA-nonresponders. These results indicated a large Cohen effect size for responders ($p < .001$, Hedges' $g = 1.59$, 95% CI = 1.10–2.08) and a medium Cohen effect size for nonresponders ($p < .001$, Hedges' $g = 0.46$, 95% CI = –0.04–0.96).

Differences between WA-responders and WA-nonresponders at baseline

Table 2 shows the basic characteristics of the participants. The two groups did not differ significantly with respect to any of the basic characteristics at baseline.

However, as shown in Table 3, WA-nonresponders scored significantly higher at baseline in terms of pain intensity (Hedges' $g = 0.52$, 95% CI = 0.06–0.99, medium Cohen effect size) and

Table 3. Correlations, means, standard deviations, and reliability at baseline for all study measures ($N = 74$).

Variable	Total $N = 74$ M (SD)	WA-responders $N = 42$ M (SD)	WA-nonresponders $N = 32$ M (SD)	PBO	PI	PC	SHC	SOM	S-E
WAS	3.8 (2.2)			-.33 ^a	-.18	-.28 ^b	-.15	.08	-.04
PBO	62.6 (17.5)	62.2 (18.9)	63.0 (15.9)	–	.25 ^b	.57 ^a	.42 ^a	-.29 ^b	-.21
PI	14.5 (8.4)	12.6 (7.5)	16.9 (8.9) [‡]		–	.70 ^a	.59 ^a	-.27 ^b	.19
PC	29.3 (19.0)	26.2 (20.0)	33.6 (17.2)			–	.63 ^a	-.39 ^a	-.07
SHC	13.6 (6.9)	12.8 (6.4)	14.6 (7.4)				–	-.35 ^a	-.02
SOM	14.3 (3.5)	15.1 (3.3) [‡]	13.2 (3.6)					–	.43 ^b
S-E	24.3 (6.4)	25.1 (6.7)	23.4 (6.0)						–
α				.86	.87	.92	.78	.65	.87

Note: WAS = work ability score; PBO = personal burnout; PI = pain intensity; PC = pain consequences; SHC = subjective health complaints; SOM = sense of mastery; S-E = self-esteem; α = Chronbach's alpha.

^aCorrelation significant at $p < .01$ (two-tailed).

^bCorrelation significant at $p < .05$ (two-tailed).

[‡] $p < .05$ for independent t -tests that compared WA-responders and WA-nonresponders at baseline.

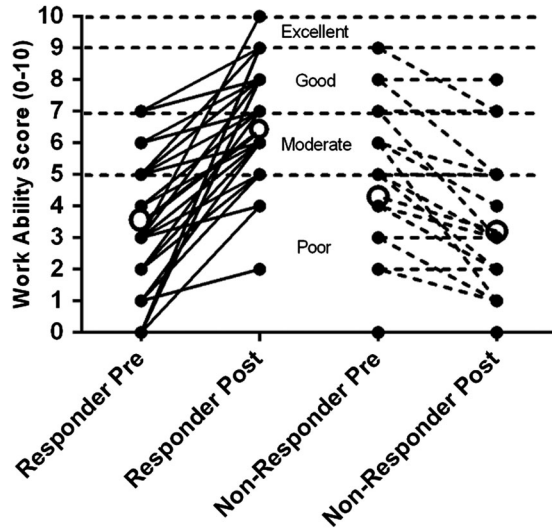


Figure 1. WAS at pretest and posttest for WA-responders and WA-nonresponders. Note: Pretest WAS: WA-responders mean = 3.5, SD = 1.9; WA-nonresponders mean = 4.3, SD = 2.5. Posttest WAS: WA-responders mean = 6.4, SD = 1.7; WA-nonresponders mean = 3.2, SD = 2.2.

WA-responders scored significantly higher at baseline in terms of sense of mastery (Hedges' $g = 0.55$, 95% CI = 0.08–1.02, medium Cohen effect size). There were no significant differences between the groups at baseline in terms of pain consequences, self-esteem, burnout personal, or SHC. At baseline, WAS was higher for WA-nonresponders (mean = 4.3, SD = 2.5) compared with WA-responders (mean = 3.5, SD = 1.9), although the difference was not significant.

As can be seen in Table 3, pain intensity had a positive correlation with pain consequences, SHC, and personal burnout and a negative correlation with sense of mastery. The sense of mastery variable had a positive correlation with self-esteem and a negative correlation with pain consequences, SHC, pain intensity, and personal burnout.

Predicting WA-responders from their baseline characteristics

The WA-responders and -nonresponders differed significantly at baseline in terms of the variables pain intensity and sense of mastery, so these variables were included in the logistic regression model. Furthermore, previous studies identified associations between WA and age (Alavinia, de Boer, van Duivenbooden, Frings-Dresen, & Burdorf, 2009), gender (Costa et al., 2005; Torgén, 2005), education level (Gould et al., 2008), and sick-leave duration (Reiso, Nygård, Brage, Gulbrandsen, & Tellnes, 2001), so these variables were used as covariates in the model. Thus, the full model contained six variables. As shown in Table 4, the results indicated that individuals who scored higher in terms of pain intensity at baseline were less likely to become WA-responders (odds ratio (OR) = 0.91, CI = 0.84–0.99), and individuals who scored higher in terms of sense of mastery were more likely to become WA-responders (OR = 1.20, CI = 1.01–1.44).

Discussion

The present study investigated changes in WA during an MVRP, as well as identifying WA-responders and WA-nonresponders. The results of this study suggest that there was an

Table 4. Logistic regression analysis for variables that predicted “WA-responders” at baseline ($N = 74$).

Variable	WA-responders				
	β	SE	OR	p	95% CI
Age	-0.03	0.03	0.97	.408	[0.92, 1.03]
Gender (0 = female, 1 = male)	1.12	0.83	3.06	.176	[0.61, 15.51]
Educational level (0 = high, 1 = low)	-0.70	0.60	0.50	.249	[0.15, 1.62]
Sick-leave duration	0.40	0.21	1.50	.061	[0.98, 2.26]
Pain intensity before treatment	-0.09	0.04	0.91	.022*	[0.84, 0.99]
Sense of mastery before treatment	0.18	0.09	1.20	.043*	[1.01, 1.44]

Note: $R^2 = 0.20$ (Cox and Snell), 0.27 (Nagelkerke); model $\chi^2(6) = 15.6, p < .05$; OR = odds ratio; CI = confidence interval; β = unstandardized beta coefficient; SE = standard error of β ; 1 = WA-responders; 0 = WA-nonresponders.

* $p < .05$.

improvement in WA in the overall sample. Moreover, the results showed that the proportion of participants who reported poor WA decreased by 26% after the intervention, where their WAS changed to moderate or even excellent. Although randomized controlled design is still needed to confirm whether improved WA is directly attributable to the intervention, this study may provide empirical justifications for such studies.

Several elements in the multi-variate program could have facilitated increased WA, either independently, or in concert. Previous research has demonstrated that mindfulness is indirectly related to WA through enhanced quality of life (Vindholmen et al., 2014). Improved self-understanding and adaptive coping strategies have been identified as important factors for recovering WA and RTW in studies researching the VTP (Braathen, Eftedal, Tellnes, & Haugli, 2015; Haugli, Maeland, & Magnussen, 2011; Haugstvedt, Hallberg, Graff-Iversen, Sørensen, & Haugli, 2011), and in particular focus on topics such as identity, resources and own values might facilitate a successful rehabilitation process (Haugli et al., 2011). Furthermore, research has shown that CBT enhances WA and RTW (Blonk, Brenninkmeijer, Lagerveld, & Houtman, 2006). We suggest that the different elements in the program in different ways supplement each other and work together in the process of change related to increased WA. We speculate that a reductional perspective to document effects on whether one form of treatment is better than other form in the program would represent a hindrance.

Specifically, we identified that 57% of the participants reported significantly improved WA after the MVRP and they were defined as WA-responders, whereas the other 43% of the participants did not report improved WA and they were defined as WA-nonresponders (see Figure 1). This finding agrees with the results reported by Watzke et al. (2006), who concluded that not all individuals reported improved work performance after vocational rehabilitation. The nonresponders had higher WAS than the responders at baseline; thus, the impact of the high WAS before treatment was certainly biased by the effect of regression toward the mean (i.e. a high pretreatment score is more likely to be significantly reduced after treatment than a low pretreatment score). However, the pretreatment difference in WAS between groups was not significant, and thus only tentative conclusions can be made.

The hypothesized significant baseline differences between WA-responders and WA-nonresponders in terms of the pain intensity and sense of mastery variables were verified in the present study. This is consistent with previous research, which showed that individuals' perceived control influences the outcome from vocational rehabilitation (Millet, 2005; Selander et al., 2007). Furthermore, the present study showed that responders and nonresponders to an MVRP differed significantly at baseline in terms of the sense of mastery and pain intensity variables,

where the outcome in terms of WA was affected by the sense of mastery and the pain intensity at baseline.

These differences in the WA response might have occurred because the nonresponders experienced a higher pain intensity, which may have distracted them from absorbing the content of the MVRP. Cognitive impairment associated with chronic pain is regarded as a major obstacle to daily activities and rehabilitation (Moriarty et al., 2011). It is well established that chronic pain impairs cognition, particularly memory, attention, and mental flexibility (Attal et al., 2014; Moriarty et al., 2011), while researchers have demonstrated that cognitive function can also predict chronic pain (Attal et al., 2014). Therefore, a better understanding of pain- and treatment-related cognitive dysfunction is needed to help improve the outcomes of vocational rehabilitation in individuals with chronic pain dysfunction.

Another explanation for the individual differences in the WA response might be that participants who scored highly in terms of sense of mastery benefited more from the program because they had more autonomous self-regulation. Some researchers (Hodgins & Knee, 2002) claim that individuals who function autonomously will be more open to experience what is occurring in the present moment compared with less autonomous individuals. In other words, the WA-responders might have been more likely to perceive the ongoing experiences of the MVRP in an accurate manner without distorting or attempting to avoid the experience, and they could have been more open to assimilating all the novel experiences of the program into their self-structures. Hodgins and Knee (2002) proposed that the motivation underlying self-structures is important for how individuals encounter ongoing conscious experiences, especially novel ones. It is possible that individuals with low control need a more gradual introduction to the novel experiences in the program and an intervention with a longer duration and/or a higher dose, so they can adapt and integrate the experiences of the educational program into their self-structure and daily lives.

A third possible explanation for the individual differences in the WA response is that the individuals with a high sense of mastery had greater pain tolerance. In the present study, a negative correlation was detected between pain intensity and sense of mastery (see Table 3). In particular, a high pain intensity was inversely correlated with the sense of mastery. This is consistent with previous research (Selander, Marnetoft, Åsell, & Selander, 2008), which showed that chronic pain and perceived control were inversely related (Crisson & Keefe, 1988; Williams, Golding, Phillips, & Towell, 2004). Some researchers (Crisson & Keefe, 1988) have shown that individuals with pain and a high perceived control trust that their own actions can affect the future course of the pain and they build up effective strategies for dealing with pain, and thus they report a lower pain intensity. Moreover, previous studies (Härkäpää, Järvikoski, Mellin, Hurri, & Luoma, 1991; Turner & Clancy, 1986) have demonstrated that individuals with low perceived control rely more on ineffective coping strategies. They report a poor ability to control and decrease their pain, they do not believe in recovery, and they avoid increasing their activity level. However, the direction of the connection between pain and perceived control could also be the reverse. It is not unusual for an individual with severe bodily pain to capitulate and lose confidence in their own ability to influence the situation, thereby assigning the problem to others, for example, a doctor (Selander et al., 2008). Nevertheless, pain and low control are unfavorable factors with respect to the vocational rehabilitation process and they could be a significant problem if they are experienced at the same time. Therefore, it is assumed that these individuals will require greater support during the vocational rehabilitation process.

In the present study, the nonresponders also appeared to have increased pain sensitivity, which may have been caused by stress. The sense of mastery and self-esteem had a positive correlation among the participants and it has been suggested (Pearlin et al., 1981) that reductions in these two elements of self comprise the final step in the process that leads to stress. Previous research has

demonstrated that stress can manifest as pain in the body (Vachon-Preseau et al., 2013) and that stress can increase pain sensitivity (Reinhardt, Kleindienst, Treede, Bohus, & Schmahl, 2013).

The hypothesized significant difference at baseline between WA-responders and -nonresponders in terms of the pain consequences and self-esteem variables was not supported by the present study. However, the correlations among the participants in this study at baseline (see Table 3) showed that pain consequences had a positive correlation with pain intensity and a negative correlation with sense of mastery. These correlations indicate that both pain intensity and sense of mastery affect the factors measured by the pain consequences variable, that is, general activity, mood, walking capability, interpersonal relationships, normal work, sleep, and enjoyment. This finding agrees with previous studies, which reported relationships between WA and mobility problems, functional capacity, mood, and social functioning (Gould et al., 2008). Furthermore, in the present study, self-esteem had a negative correlation with the sense of mastery variable (Table 3), which agrees with Judge, Erez, Thoresen, and Bono's (2002) suggestion of a clear connection between the perceived control and self-esteem constructs.

As shown in Table 4, the logistic regression analysis identified pain intensity and sense of mastery as significant predictors of the WA response, after controlling for other variables in the model. These results agree with previous studies, which identified pain as a predictor of poor WA and unsuccessful RTW (Dekkers-Sánchez et al., 2008, 2013; Neupane et al., 2011); cognitive impairment associated with pain was a major obstacle to rehabilitation (Moriarty et al., 2011), and perceived control as related to a variety of positive outcomes, including vocational rehabilitation (Millet, 2005; Skinner, 1996). Moreover, the present study demonstrated that the baseline pain intensity and sense of mastery were prognostic factors for the likelihood of success or failure in improving WA during an MVRP. Nevertheless, the results of this study should not be misinterpreted as demonstrating that WA-nonresponders should not participate in MVRPs. The definition of the success of vocational rehabilitation is too complex to be limited to one dimension. Some questions still need to be addressed to explain the differences between MVRP responders and nonresponders. Therefore, future research should focus on exploring what distinguishes MVRP responders from nonresponders. Clearly, longitudinal studies are needed to investigate the long-term stability of WA-responder groups and their success in achieving RTW. In addition, a core component of the program investigated in this study was mindfulness where some participants improved WA, whereas others did not; thus, future research should consider the role of mindfulness training when applied in this context and investigate whether mindfulness induces a WA response to an MVRP.

Strengths and limitations

A major strength of this study was its high ecological validity; we investigated an MVRP provided by a local vocational enterprise and funded by NLWA. However, this study also had some limitations. The design lacked strict randomization because we could not influence the assignment of individuals to the program. However, the participants were representative of all the participants over a period of time and all of the participants completed the MVRP. Thus, a prospective controlled design would be required to investigate whether the MVRP enhanced the WA in this population and to determine whether this enhanced WA translated into an increased probability of RTW.

The criteria used to decide program duration were based on the participants' own motivation to continue in the program. Twelve participants attended 4 weeks and 62 participants attended 6 weeks. Motivation and program duration may have affected the results. However, because of a relatively low number of participants in the study, we chose to include the 4-week participants.

In the present study, the research question required the outcome variable (WAS change) to be dichotomized between WA-responders and WA-nonresponders, and thus logistic regression analysis to be performed. Nevertheless, results from the logistic regression analysis should be interpreted with caution because different analytical approaches gave different conclusions (see [appendix](#)). When conducting a linear regression analysis on the model using the WAS change variable, the total variance explained by the model was 8.5%, $F(6, 63) = .970$, $p = .45$. The non-significant F value indicates that our data did not fit a linear model. In the linear regression analysis, none of the independent predictor variables made a significant contribution to the model. Nevertheless, we argue that also from a statistical point of view, logistic regression analysis was preferable because important assumptions to linear regression were violated, such as linearity, and normal distribution of the WAS change variable. Future research should perhaps probe the existence of a threshold phenomenon that marks a sensitive range demarcating the manageable from the unmanageable for pain, and its relation to sense of mastery.

In the logistic regression analysis, the proposed model contained six variables and the sample counted 74 participants, which gives 12.3 respondents per variable. As such, the logistic regression analysis may suffer from low statistical power, and this should be considered when interpreting the results.

It is possible that the generalizability of the findings of this study is limited by the relatively low number of participants ($N = 74$). Indeed, generalizability to other contexts is limited because the participants in this study were all on long-term sick leave.

Conclusions

Overall, the results of this study contribute to understanding the individuals who might benefit from an MVRP in terms of WA. The results suggest that there was an improvement in WA in the overall sample and the proportion of participants with poor WA decreased by 26% after the intervention, where their WA changed to moderate or even excellent. However, not all of the participants reported WA improvements after the intervention. Unfavorable WA responses were detected in participants who had high pain intensity scores and low sense of mastery scores at baseline. Indeed, pain intensity and sense of mastery were identified as predictors of an unsuccessful treatment outcome in terms of WA. Only tentative conclusions can be drawn from this study, but hopefully, these findings will encourage further explorations of the connections between pain intensity, control, and the outcomes of vocational rehabilitation in terms of WA and RTW.

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Appendix

Table A1. Multiple regression analysis for variables that predicted WA change from their baseline characteristics ($N = 74$).

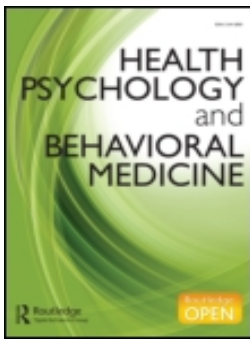
Variable	B	SE	WA change			
			β	t	p	95% CI
Constant	-0.80	2.73		-0.29	.77	[-6.26, 4.66]
Age	-0.00	0.03	-.01	-0.06	.95	[-0.07, 0.07]
Gender (0 = female, 1 = male)	0.52	0.88	.08	0.59	.56	[-1.23, 2.27]
Education level (0 = high, 1 = low)	0.25	0.70	.05	0.36	.72	[-1.14, 1.64]
Sick-leave duration	0.15	0.23	.09	0.66	.51	[-0.31, 0.62]
Pain intensity before treatment	-0.07	0.04	-.21	-1.53	.13	[-0.15, 0.02]
Sense of mastery before treatment	0.11	0.10	.15	1.14	.26	[-0.08, 0.31]

Note: $R^2 = .08$ ($p > .05$); B = unstandardized regression coefficients; β = standardized regression coefficients; CI = confidence interval.

Predicting WA change from their baseline characteristics

Multiple regression analysis was performed between WAS change as the dependent variable and baseline pain intensity, sense of mastery and the covariates age, gender, education level, and sick-leave duration as independent variables. Results of evaluation of assumptions indicated that important assumptions to linear regression were violated, such as linearity and normal distribution of the WAS change variable. The total variance explained by the model was 8.5%, $F(6, 63) = .87$, $p = .45$. The non-significant F value indicates that our data did not fit a linear model. In the linear regression analysis, none of the independent predictor variables made a significant contribution to the model.

Paper III



Does mindfulness affect participants' response to a vocational rehabilitation program?

Solveig Vindholmen, Rune Høigaard, Tommy Haugen & Stephen Seiler

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Does mindfulness affect participants' response to a vocational rehabilitation program?

Solveig Vindholmen, Rune Høigaard, Tommy Haugen and Stephen Seiler

Faculty of Health and Sport Sciences, University of Agder, Kristiansand, Norway

ABSTRACT

Objective: The study aims were to investigate whether mindfulness predicts improved work ability after a multifactorial vocational rehabilitation program in Norway and to examine the mediating influence of mindfulness in the relationship between personal health factors and changes in work ability in response to the program. *Methods:* Seventy-four participants on long-term sick leave completed questionnaires assessing mindfulness, work ability, functional health, psychological functioning, and demographics before and after a 4–6-week multidisciplinary vocational rehabilitation program. In addition to a standard logistic regression analysis, a bias-corrected bootstrapping technique was used to test the hypothesized indirect effects. *Results:* Enhanced mindfulness over the course of the program significantly predicted a positive change in work ability. Furthermore, decreased personal burnout and enhanced self-esteem were both unique predictors of such positive change. Mindfulness mediated the effects of personal burnout and self-esteem on participants' work ability. Increased body responsiveness and sense of mastery, and decreased pain consequences and subjective health complaints, were indirectly related to positive changes in work ability through increased mindfulness. *Conclusion:* Enhancing mindfulness skills is useful for improving the work ability of Norwegians on long-term sick leave.

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KEYWORDS

Mindfulness; work ability; vocational rehabilitation; return to work; multidisciplinary

Introduction

Long-term sick leave rates have increased in industrialized countries (Gabbay et al., 2011). Musculoskeletal disorders and mild-to-moderate mental health problems cause the majority of long-term sick leave in Norway (Brage, Ihlebaek, Natvig, & Bruusgaard, 2010; Ihlebaek, Brage, & Eriksen, 2007; OECD, 2013) and in other European countries (Gabbay et al., 2011). In addition, other unspecific health complaints often co-occur, increasing the risk of disability and long-term sick leave (Linder, Ekholm, Jansen, Lundh, & Ekholm, 2009; Øyeflaten, Hysing, & Eriksen, 2008; Salmi et al., 2009). The diagnostic basis for conditions resulting in long-term sick leave is therefore often very diffuse, with no or few objective medical explanations (Hagen, 2006; Øyeflaten et al., 2008; Salmi

CONTACT Solveig Vindholmen  solveig.vindholmen@uia.no

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et al., 2009). It is also often difficult to differentiate medical issues from the individual's social life or overall life situation and thus difficult to identify the main reason for reduced ability to work (Brage & Hernes, 2010). Vocational rehabilitation targets this heterogeneous group of participants on long-term sick leave. Strengthened effort has been made in Norway to enhance return to work (RTW) rates for people on long-term sick leave. A large array of vocational rehabilitation measures have been developed and the number of participants in vocational rehabilitation increased 33% from 2000 to 2011; from around 40,000 to around 60,000 (OECD, 2013). The main goal of vocational rehabilitation is to enhance work ability (WA) and RTW rates (Braathen, Veiersted, & Heggenes, 2007; Escorpizo et al., 2011; Kuoppala & Lamminpää, 2008). Thus, WA has become a key concept in RTW rehabilitation and there is general agreement in the literature that WA must be understood as a dynamic relational concept between the individual, organizational, and societal factors (Lederer, Loisel, Rivard, & Champagne, 2014). Multidisciplinary vocational rehabilitation programs (MVRPs) are effective at increasing WA and RTW (Braathen et al., 2007; Gabbay et al., 2011). Unfortunately, we lack knowledge about what works for whom, and when, in vocational rehabilitation (Waddell, Burton, & Kendall, 2008). Risk factors for poor WA, unsuccessful RTW, and long-term sick leave have been studied extensively (Dekkers-Sánchez, Hoving, Sluiter, & Frings-Dresen, 2008; Lagerveld et al., 2010; Øyeflaten et al., 2008), while factors that may improve WA and RTW have unfortunately not been studied with the same intensity (Airila, Hakanen, Punakallio, Lusa, & Luukkonen, 2012; Gard & Sandberg, 1998). However, it is difficult to understand factors that promote positive health, balance, and meaningful lives through investigating ill health, sick leave, and suffering alone (Snyder, Lopez, & Pedrotti, 2011); factors that may actually improve WA are needed (Airila et al., 2012). Some MVRPs pay considerable attention to and suggest mindfulness as a potential tool for improving WA. Unfortunately, very few studies have investigated the connection between mindfulness and WA (De Vibe, Bjørndal, Tipton, Hammerstrøm, & Kowalski, 2012).

Mindfulness generally enhances both physical and mental health (Brown, Ryan, & Creswell, 2007), and mindfulness-based interventions are effective for treating clinical disorders such as depression and anxiety (De Vibe et al., 2012), chronic pain (Esmer, Blum, Rulf, & Pier, 2010; Grossman, Tiefenthaler-Gilmer, Raysz, & Kesper, 2007), and stress and burnout (Cohen-Katz et al., 2005). In addition, mindfulness training increases quality of life (De Vibe et al., 2012), cognitive functioning (Jha, Krompinger, & Baime, 2007), and autonomous regulation and self-esteem (Brown & Ryan, 2003) and plays a major role in the shaping of body awareness (Mehling et al., 2009). The origin of mindfulness is rooted in ancient Buddhist practice and philosophy (Kabat-Zinn, 2003). In the 1970s mindfulness was introduced to Western medicine and has become an acknowledged method for health promotion in Western culture. Efforts have been made to define and operationalize mindfulness, and one widely recognized definition is *paying attention on purpose, in the present moment, nonjudgmentally* (Kabat-Zinn, 1990). Mindfulness is the capacity to be fully conscious, from moment to moment, of all intrapersonal experiences, including body and mind, as well as the capacity to be conscious of all interpersonal experiences, including people, surroundings, and events. When people are mindful they are more capable of acting purposefully and are more openly attentive to and aware of themselves and the situations in which they find themselves (Brown et al., 2007). Thus,

mindfulness provides individuals a quality of consciousness characterized by the clarity and vividness of current experience and functioning and therefore contributes directly to well-being and vitality (Brown & Ryan, 2003). Hölzel et al. (2011) reviewed existing theoretical literature and suggested that mindfulness practice comprises a process of self-regulation differentiated by distinct but interrelated components: (1) attention regulation (i.e. an especially important mechanism of mindfulness, the basis of all meditation techniques, and which appears to be a prerequisite for other effects); (2) body awareness (i.e. the ability to notice subtle body sensations); (3) emotion regulation (i.e. regulating for nonreactivity); and (4) changes in perspective on the self (i.e. awareness of the transitory nature of the self, diminished self-referential processes, and enhancement of first-person experiences). This process leads to enhanced self-regulation, which is a process that enables individuals to guide their goal-directed activities by modulation of thought, affect, behavior, or attention via deliberate or automated use of specific mechanisms (Karoly, 1993).

In contrast, mindlessness is a state of consciousness that is limited in various ways, such as the limitation of rumination, absorption in the past, or fantasies and anxieties about the future (Deci & Ryan, 1980). Mindlessness can be defensively motivated, for example through nonacceptance of a thought, emotion, motive, or object of perception (Brown & Ryan, 2003), or signals can be ignored or suppressed by self-medication (e.g. pain killers, alcohol, or drugs). When this kind of dysregulation occurs, attention is required to reestablish communication between elements of a system (e.g. mind and body or thought and behavior) before wellness can be restored (Schwartz, 1984). Mindfulness is typically cultivated by formal meditation exercises, such as sitting meditation, walking meditation, or mindful movements, or informal mediation exercises, such as being present in everyday activities such as drinking tea, washing dishes, talking to friends, or washing hands (Kabat-Zinn, 1990).

The MVRP investigated here was carried out in a vocational rehabilitation enterprise setting located in South Norway. The intervention aims targeting individuals on sick leave and other users of the local Norwegian Labour and Welfare Administration (NLWA) who reports poor WA (i.e. reduced by at least 50%). The program is funded by the NLWA, which also assigns individuals to the program. The MVRP aims to improve the participant's WA by facilitating more autonomous and inner-directed behaviors (Haavorsen et al., 2009). Mindfulness-based stress reduction is a core MVRP component. Previous research on this particular MVRP has reported that mindfulness may enhance RTW and WA through quality of life and that mindfulness significantly predicts RTW for highly educated individuals (Vindholmen, Høigaard, Espnes, & Seiler, 2014). However, very few studies have explored the connection between mindfulness and WA (De Vibe et al., 2012). The purpose of this study was therefore to examine: (1) whether changes in mindfulness levels from pretest to posttest predict a successful WA response; (2) whether changes in personal health factors (Figure 1) from pretest to posttest predict a successful WA response; and (3) how mindfulness mediates the relationship between changes in personal health factors from pretest to posttest and WA response, controlling for age and gender (see Figure 1). To the best of our knowledge, this is the first prospective, quantitative study investigating the association between WA and mindfulness in an MVRP.

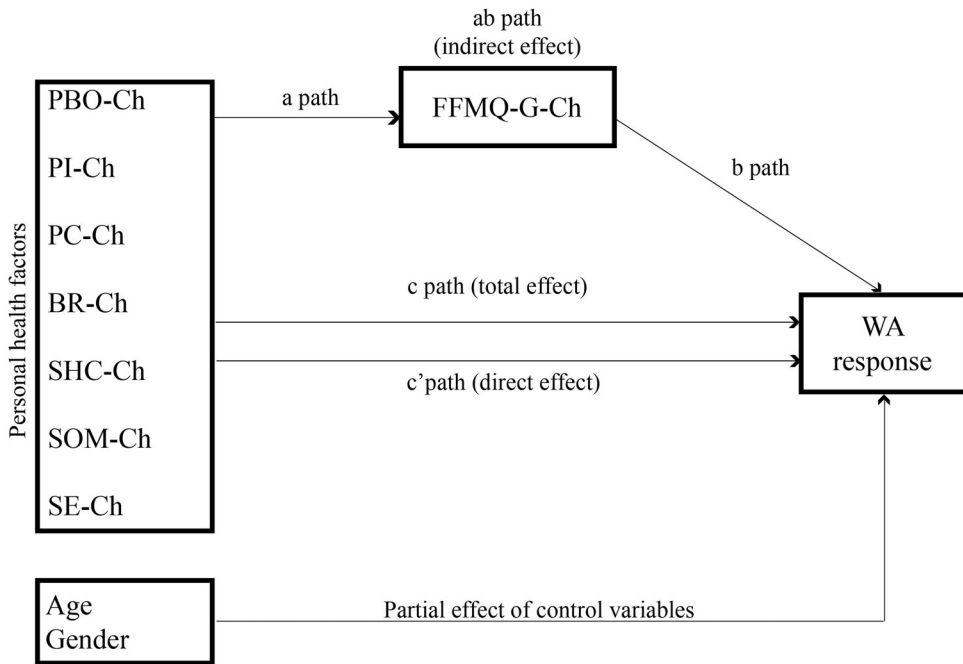


Figure 1. Hypothesized mediation model (conceptual model number 4 in Hayes' (Hayes, 2013) macro application "Process").

Note: PBO-Ch, personal burnout change; PI-Ch, pain intensity change; PC-Ch, pain consequences change; BR-Ch, body responsiveness change; SHC-Ch, subjective health complaints change; SOM-Ch, sense of mastery change; SE-Ch, self-esteem change; FFMQ-G-Ch, Five Facet Mindfulness Questionnaire Global Change.

Materials and methods

Participants

In this prospective cohort study, the study sample comprised 74 individuals aged 23–59 years, 14 men and 60 women, (mean = 41, SD = 9) who completed a 4- or 6-week MVRP at a vocational enterprise in South Norway. Participants were typically nurses, auxiliary nurses, teachers, milieu therapists, preschool teachers or kindergarten assistants, secretaries, and blue-collar workers. Their common diagnoses were musculoskeletal disorders, depression, anxiety, burnout, stress, chronic fatigue syndrome, fibromyalgia, and various combinations of these diagnoses.

The vocational rehabilitation program

Subjects participated in an MVRP including both group-based treatment and individual counseling. The program was managed by an interdisciplinary team (e.g. nurses, physiotherapists, teachers, and occupational therapists) skilled in teaching mindfulness and the Vitality Training Program (Haugli & Steen, 2001; Steen & Haugli, 2000). All participants attended about 6 hours per day, 3 days per week. Program duration was 6 weeks ($N = 62$), and 4 weeks ($N = 14$). The NLWA assigned participants to the MVRP, and

determined program duration based on the participant's motivation to carry on in the program. The MVRP content included the following three categories:

Educational program

The present educational program is built on a mindfulness-based intervention for individuals with chronic musculoskeletal pain, named Vitality Training Program, developed by Haugli and Steen (Haugli & Steen, 2001; Steen & Haugli, 2000) and based on: (1) mindfulness (Kabat-Zinn, 1990); (2) phenomenological understanding of the body (Merleau-Ponty, 2002); (3) gestalt theory (Pearls, 1969) and confluent education methods (Brown, 1971), and (4) the psychology of personal constructs (Kelly, 1991; Nygard & Kunszenti, 1999). The focus in the group learning program is to help participants become aware of the close relationship between their body, emotions, and mind; to help them shift their focus from pain and disability to their personal resources and potentials; to teach them new coping strategies; and to help them become more self-confident (Steen & Haugli, 2000).

Mindfulness training was instructed both as informal meditation exercises (e.g., everyday activities presence) and formal meditation exercises lasting from 5 to 20 minutes (e.g., body scan, sitting meditation). Confluent education methods (Brown, 1971) are used to create experiential learning situations. "Confluence" refers to the integration of cognition, affect, and bodily sensations. The concept of "awareness" is essential in confluent education and refers to "what is happening in the present moment", as opposed to "thinking about" (Brown, 1998). Participants were encouraged to view their body from the first-person perspective and to become aware of the experience-based knowledge embedded in their body. The educational methods used to enhance awareness and the meaning construction process included, among others, use of metaphors, language, guided imagery and drawings as images (Steen & Haugli, 2000). Topics such as physical activity, lifestyle and work-related issues were also covered in the educational program.

Physical activity

The physical activities applied in the program prioritized the development of core stability, functional strength, body awareness, balance, and overall endurance and strength. Participants were introduced to hatha yoga, cycle ergometer spinning, basic strength and endurance training, and psychomotor physiotherapy. Participants were encouraged to discover new experiences and become more aware of themselves and their body, their limits and possibilities. Physical activity was used in a methodical manner to facilitate the participants' belief of their own ability to gradually extend their physical, psychological, and social limits and capacity.

Individual counseling

Every second week the participants were given individual counseling based on Cognitive Behavior Therapy (CBT) (Farmer & Chapman, 2008), and they were also given one individual counseling session in psychomotor physiotherapy (Braatøy, 1947; Thornquist & Bunkan, 1991). Participants were offered help with communicating their special needs to the NLWA (for unemployed participants), or to their employer (for employed participants).

Procedure

All MVRP participants from August 2011 to August 2012 ($N = 119$) were invited to participate in the study; 83 individuals accepted and 74 completed both the pretest and posttest (9% dropout). Participants and nonparticipants (6 male and 30 female aged 28–59 years, mean age = 41, $SD = 8$) did not differ significantly in basic demographic characteristics. The Norwegian Social Science Data Service and the National Ethics Committee – Health Region South approved the study. Confidentiality was assured, and all participants were volunteers and gave their written informed consent to participate in the study. Each participant answered a self-report questionnaire before and after the MVRP. The questionnaire could be answered using pen and paper or the Internet (www.surveymxact.com)

Instruments

Work ability

Work ability was measured using the single-item Work Ability Score (WAS) (Tuomi, Ilmarinen, Jahkola, Katajarinne, & Tullki, 1998); “Current work ability compared with the lifetime best” ranging from 0 (*completely incapable to work*) to 10 (*my best work ability ever*). WAS is the first item in the Work Ability Index (WAI) (Tuomi et al., 1998) and the convergent validity between WAS and WAI is statistically significant (El Fassi et al., 2013). A strong association between the complete WAI and WAS has also been identified by Ahlstrom, Grimby-Ekman, Hagberg, and Dellve (2010). WAS has been reported to validly measure WA among both active workers (El Fassi et al., 2013), and individuals on long-term sick leave (Ahlstrom et al., 2010). The WAS is further subcategorized as excellent (10 points), good (8–9 points), moderate (6–7 points), and poor (0–5 points) (El Fassi et al., 2013; Gould, Ilmarinen, & Jarvisalo, 2008).

Mindfulness

Mindfulness was assessed using the Norwegian version (Dundas, Vøllestad, Binder, & Sivertsen, 2013) of the Five Facet Mindfulness Questionnaire, FFMQ (Baer et al., 2008), which measure five facets of a general tendency to be mindful in everyday life. The *observing* scale’s eight items assess the degree of attending to or noticing internal and external stimuli such as sensations, emotions, cognitions, sights, sounds, and smells. An item example follows: “I notice the smells and aromas of things”. The *describing* scale’s eight items measure the degree of noting or mentally labeling these stimuli with words. An item example follows: “I am good at finding words to describe my feelings”. The *acting with awareness* scale’s eight items assess the tendency to attending to one’s current actions, as opposed to behaving automatically or absentmindedly. An item example follows: “I find myself doing things without paying attention” (item reversed). The *non-judging of inner feelings* scale’s eight items measure the tendency to refraining from evaluation of one’s sensations, cognitions, and emotions. An item example follows: “I think some of my emotions are bad or inappropriate and I should not feel them” (item reversed). And the *nonreactivity to inner experience* scale’s seven-item measure the tendency to allowing thoughts and feelings to come and go without catching one’s attention. An item example follows: “I perceive my feelings and emotions without having to react to them”. All items were measured using a 5-point Likert scale ranging from one (*never or*

very rarely true) to five (*very often or always true*). Psychometric support for the measure is derived from the analysis in the 2013 study by Dundas et al. (2013).

Personal burnout

One subscale from the Copenhagen Burnout Inventory (Kristensen, Borritz, Villadsen, & Christensen, 2005) was used to assess personal burnout, defined as “the degree of physical and psychological fatigue and exhaustion experienced by the person” (p. 197). The subscale personal burnout was designed to measure burnout regardless of occupational status (i.e. unemployed, pensioners, and young people were included). The personal burnout subscale consists of six items, an item example “How often do you feel weak and susceptible to illness?”. Each question is scaled on a 5-point scale from 1 (*never or almost never*) to 5 (*always or to a very high degree*). These responses were rescaled to a 1–100 metric, with high scores (≥ 50) indicating high levels of burnout. Kristensen et al. (2005) found satisfactory estimates of the Copenhagen Burnout Inventory’s validity and reliability.

Pain intensity/pain consequences

Pain intensity and pain consequences were measured using items from the Norwegian version (Klepstad et al., 2002) of the Brief Pain Inventory (Cleeland, 2009). Four items assessed pain intensity (pain now, average pain, worst pain, and least pain) using a scale ranging from 0 (*no pain*) to 10 (*pain as bad as you can imagine*). Seven items assessed the level of interference with functioning caused by pain (general activity, mood, walking ability, normal work, relations with other persons, sleep, and enjoyment of life) with rating scales from 0 (*no interference*) to 10 (*complete interference*). The items were divided into two subscales: (1) a pain severity index (i.e. pain intensity), using the total of the four pain intensity items; and (2) a function interference index (i.e. pain consequences), using the total of the seven items on pain interference. The scale has good psychometric properties (Klepstad et al., 2002; Tan, Jensen, Thornby, & Shanti, 2004).

Body responsiveness

A 7-item scale developed by Daubenmier (2005) was used to measure responsiveness to bodily sensations. Item examples are “I suppress my bodily feelings and sensations” (reverse coded) and “I listen to my body to advise me about what to do”. Responses were measured on a 7-point scale ranging from 1 (*not at all true about me*) to 7 (*very true about me*). Higher scores reflect greater body responsiveness, and Daubenmier reported the Cronbach’s alpha among items to be .83 (Daubenmier, 2005). The questionnaire was translated into Norwegian using standardized methods (Kvamme et al., 1998).

Subjective health complaints

Twelve items from the Subjective Health Complaints Inventory (SHC) (Eriksen, Ihlebæk, & Ursin, 1999) were used to measure how subjective somatic and psychological health complaints were experienced: low back pain, upper back pain, leg pain, shoulder pain, arm pain, neck pain, headache, anxiety, depression/sadness, dizziness, stomach discomfort/digestive trouble, and chest pain. To cover more rare complaints, one item was added, “other complaints”. Using a 4-point Likert-type scale ranging from 0 (*none*) to 3 (*severe*) the participants rated the severity of each complaint during the past month.

Items were summed for a total score. The scale has been found to have good validity and reliability (Eriksen et al., 1999).

Sense of mastery

A 5-item Norwegian version (Dalgard, Mykletun, Rognerud, Johansen, & Zahl, 2007) of a scale developed by Pearlin, Lieberman, Menaghan, and Mullan (1981) measured the sense of mastery. An item examples are “I have little control over the things that happen to me”. All items were rated on a 5-point scale ranging from 5 (*strongly disagree*) to 1 (*strongly agree*). Items were summed for a sense of mastery score, where higher scores indicate higher levels of mastery. Dalgard et al. (2007) analyzed the psychometric properties of the Norwegian version of the scale and obtained satisfactory estimates of the instrument’s reliability and validity.

Global self-esteem

The Norwegian version (von Soest, 2005) of Rosenberg’s self-esteem scale (Rosenberg, 1965) was used to measure global self-esteem. The scale consists of 10 items on which participants were asked to make judgments about their own self-worth (e.g. “on the whole, I am satisfied with myself”) using 4-point scales from 1 (*strongly disagree*) to 4 (*strongly agree*). The scale sum score ranges from 10 to 40, where a higher sum score indicates higher self-esteem. Psychometric support for this measure was derived from von Soest (von Soest, 2005).

Covariates

Baseline data on potential effect modifiers were assessed, including age and gender.

Statistical analysis

Statistical Package for the Social Sciences (SPSS) for Windows (version 19, IBM Corporation, Armonk, NY, USA) was used for data analyses.

WAS was rated at intake and in the final intervention week. WA response was measured by the WAS variable, dichotomized as WA-responders and WA-nonresponders. To identify WA-responders and WA-nonresponders, the change in WAS between the two time points was determined by conducting a dependent *t*-test on the WAS variable (Tuomi et al., 1998). Participants with an improved WAS from pretest to posttest were defined as WA-responders; those who did not improve at all or whose WAS score decreased were defined as WA-nonresponders.

To test for statistically significant differences between the two groups’ characteristics at baseline, an independent-samples *t*-test was conducted for the variable “age” and chi-square tests were performed for the categorical variables. To test for changes between the two time points for all other study measures, paired-samples *t*-tests were conducted. For variables on which both groups changed significantly from pretest to posttest, independent-samples *t*-tests were conducted to test whether the changes differed significantly between the groups.

Mediation refers to situations in which the significant relationship between independent and dependent (outcome) variables is accounted for by a third, or mediator, variable (Mathieu & Taylor, 2006). In the present study, conceptual model number 4 in Hayes’

(2013) macro application “Process” for SPSS (see [Appendix A](#) in Hayes’ “Process” (Hayes, 2013)), was used to test the hypothesized simple mediator model ([Figure 1](#)) while also controlling for covariates. “Process” (Hayes, 2013) uses a regression-based approach for estimating indirect, direct, and total effects in mediation, moderation, and conditional process analyses. Moreover, “Process” produces bootstrap estimates and bias-corrected confidence intervals (CIs) for indirect effects. Bootstrapping refers to a nonparametric resampling procedure to test the null hypothesis for indirect effects and involves repeated extraction with replacement of samples from the data set. In the present study, a 95% CI was constructed on the basis of 50,000 bootstrap estimates. A bias-corrected CI that does not include zero indicates a statistically significant indirect effect. Preacher and Hayes’ (2008) technique tolerates that X can exert an indirect effect on Y through M in the absence of an association between X and Y. In this case, Preacher and Hayes (2004) recommend to refer to X’s indirect effect on Y through M, and avoid the term “mediator”. Moreover, Hayes (2009) encourage proceeding with analysis of indirect effects also in the absence of a total effect, to ensure that potentially interesting and important information will not be missed.

Instead of including several X variables in one model, in the present study several models were estimated, each focusing on a single X variable at a time. According to Hayes (2013), this procedure is legitimate and recommended in studies with highly correlated X variables.

There were no missing data for the dependent WA variable. In addition, there were no missing data for the majority of the independent variables; missingness was only present for the independent variables pain intensity (2.7%), pain consequences (1.4%), and body responsiveness (1.4%). Missing data were found to be missing completely at random using Little’s test ($p = .993$). Before computing the scales, mean estimates were calculated from available data and inserted in place of the missing values. In cases where more than two items in a scale were missing, the case was considered missing.

Results

The two groups did not differ significantly for any basic characteristics. Moreover, independent t -tests did not detect a significant difference between groups at baseline on any facets of the FFMQ. As shown in [Table 1](#), WA-responders improved significantly from pretest to posttest on all mindfulness variables, except those in the nonreactivity facet. The effect size (Hedges’ g) for FFMQ global improvement for WA-responders was 0.51, $CI = 0.08$ to 0.94 , a medium effect size according to Cohen (1988). Moreover, WA-responders improved significantly on personal burnout, pain consequences, SHC, body responsiveness, sense of mastery, and global self-esteem. WA-nonresponders did not improve significantly on any of the mindfulness variables, whereas they improved significantly on personal burnout, SHC, and body responsiveness.

Since both groups decreased significantly on personal burnout and SHC and increased significantly on body responsiveness, independent t -tests were performed to test whether changes were significantly different between groups. WA-responders improved significantly more than WA-nonresponders on personal burnout ($p < .05$).

Correlation coefficients at baseline on all study measures are reported in [Table 2](#). Correlation between WAS and burnout and WAS and pain consequences was negative.

Table 1. Means and SDs at pretest and posttest for WA-responders and WA-nonresponders. Paired-samples *t*-tests with the data stratified on WA-responders/nonresponders (*N* = 74).

Measurements	Group	Pretest			Posttest			<i>p</i>
		<i>N</i>	<i>α</i>	<i>M</i> (<i>SD</i>)	<i>N</i>	<i>α</i>	<i>M</i> (<i>SD</i>)	
Observe FFMQ	Responders	42		25.3 (7.0)	42		27.2 (6.7)	<.01
	Nonresponders	32		23.7 (5.2)	32		24.6 (5.3)	.24
	Total sample	74	.81	24.6 (6.3)	74	.85	26.0 (6.3)	<.01
Describe FFMQ	Responders	42		24.6 (7.3)	42		28.2 (6.9)	<.01
	Nonresponders	32		25.2 (6.3)	32		26.5 (6.8)	.07
	Total sample	74	.91	24.9 (6.9)	74	.93	27.5 (6.9)	<.01
Act Aware FFMQ	Responders	42		20.3 (5.9)	42		23.6 (5.6)	<.01
	Nonresponders	32		22.6 (5.1)	32		22.4 (5.3)	.79
	Total sample	74	.84	21.3 (5.6)	74	.87	23.1 (5.4)	<.01
Nonjudge FFMQ	Responders	42		24.0 (6.0)	42		25.8 (6.1)	.02
	Nonresponders	32		23.6 (7.1)	32		22.6 (6.4)	.20
	Total sample	74	.85	23.8 (6.4)	74	.87	24.4 (6.4)	.29
Nonreact FFMQ	Responders	42		19.8 (4.7)	42		20.4 (4.3)	.27
	Nonresponders	32		19.4 (3.3)	32		19.6 (3.8)	.77
	Total sample	74	.70	19.6 (4.1)	74	.72	20.1 (4.1)	.31
FFMQ global	Responders	42		22.8 (4.3)	42		25.0 (4.4)	<.01
	Nonresponders	32		22.9 (2.9)	32		23.2 (3.4)	.60
	Total sample	74	.89	22.9 (3.8)	74	.92	24.2 (4.1)	<.01
Burnout personal	Responders	42		62.2 (18.9)	42		48.2 (19.2)	<.01
	Nonresponders	32		63.0 (15.9)	32		57.7 (19.4)	.03
	Total sample	74	.86	62.6 (17.5)	74	.89	52.3 (19.7)	<.01
Pain intensity	Responders	41		12.6 (7.5)	41		13.2 (8.7)	.88
	Nonresponders	31		16.9 (8.9)	31		16.1 (10.2)	.47
	Total sample	72	.87	14.5 (8.4)	72	.90	14.2 (9.5)	.70
Pain consequences	Responders	42		26.2 (19.9)	42		17.3 (17.0)	<.01
	Nonresponders	31		33.6 (17.2)	31		30.2 (18.5)	.22
	Total sample	73	.92	29.3 (19.0)	73	.93	22.7 (18.7)	<.01
SHC	Responders	42		12.8 (6.4)	42		10.2 (6.2)	<.01
	Nonresponders	32		14.6 (7.4)	32		13.0 (8.0)	.04
	Total sample	74	.78	13.6 (6.9)	74	.83	11.4 (7.1)	<.01
Body responsiveness	Responders	41		26.7 (6.3)	41		30.5 (7.3)	<.01
	Nonresponders	32		24.6 (6.3)	32		27.6 (6.3)	.03
	Total sample	73	.66	25.8 (6.4)	73	.77	29.2 (7.0)	<.01
Sense of mastery	Responders	42		15.1 (3.3)	42		16.8 (4.2)	.01
	Nonresponders	32		13.3 (3.6)	32		14.0 (4.1)	.19
	Total sample	74	.65	14.3 (3.5)	74	.83	15.6 (4.4)	<.01
Global self-esteem	Responders	42		25.1 (6.7)	42		28.3 (6.4)	<.01
	Nonresponders	32		23.3 (6.0)	32		24.0 (6.8)	.44
	Total sample	74	.87	24.3 (6.4)	74	.90	26.4 (6.8)	<.01

Note: *α* = Cronbach's alpha.

Mindfulness (FFMQ-G) was positively correlated with body responsiveness, sense of mastery and self-esteem.

Correlation coefficients for change scores on all study measures are reported in Table 3. The correlations between WAS and the mindfulness facets were positive. By contrast, the correlation between WAS and burnout was negative. Change in the mindfulness score was positively correlated with change in self-esteem and body responsiveness and negatively correlated with change in SHC, pain consequences, and burnout.

The mediator model – predicting mindfulness

Data concerning the effect of rehabilitation outcome on WA response through mindfulness are shown in Table 4. When investigating the mediator model (i.e. the effect of the

Table 2. Correlations at baseline among all study measures ($N = 74$).

	2	3	4	5	6	7	8	9	10	11	12	13	14
1. WAS	-.09	-.06	-.03	-.19	-.19	-.17	-.32 ^a	-.18	-.28 ^b	-.08	-.15	.08	-.10
2. FFMQ-O		.51 ^a	.24 ^b	.18	.27 ^b	.71 ^a	-.11	-.21	-.13	.35 ^a	-.09	.37 ^a	.14
3. FFMQ-D			.35 ^a	.24 ^b	.06	.73 ^a	-.12	-.03	-.01	.20	.03	.15	.23 ^b
4. FFMQ-AA				.49 ^a	.01	.67 ^a	-.35 ^a	.05	-.04	.32 ^a	-.16	.36 ^a	.20
5. FFMQ-NJ					.08	.65 ^a	-.18	.13	-.03	.15	-.02	.43 ^a	.57 ^a
6. FFMQ-NR						.36 ^a	.29 ^b	.11	.14	.09	.05	.12	.18
7. FFMQ-G							-.18	.00	-.04	.35 ^a	-.06	.45 ^a	.43 ^a
8. PBO								.24 ^b	.57 ^a	-.37 ^a	.42 ^a	-.29 ^b	-.20
9. PI									.70 ^a	-.09	.59 ^a	-.27 ^b	-.10
10. PC										-.19	.63 ^a	-.39 ^a	-.29 ^b
11. BR											-.07	.23 ^b	.06
12. SHC												-.35 ^a	-.20
13. SOM													.44 ^a
14. S-E													

Note: WAS, Work Ability Score; FFMQ, Five Facet Mindfulness Questionnaire; FFMQ-O, FFMQ-Observe; FFMQ-D, FFMQ-Describe; FFMQ-AA, FFMQ-Act Aware; FFMQ-NJ, FFMQ-Nonjudge; FFMQ-NR, FFMQ-Nonreact; FFMQ-G, FFMQ-Global; PBO, personal burn out; PI, pain intensity; PC, pain consequences; SHC, subjective health complaints; SOM, sense of mastery; BR, body responsiveness; S-E, self-esteem.

^aCorrelation is significant at the $p < .01$ level (two-tailed).

^bCorrelation is significant at the $p < .05$ level (two-tailed).

Table 3. Correlations between change variables (posttest–pretest) among all study measures ($N = 74$).

	2	3	4	5	6	7	8	9	10	11	12	13	14
1. WAS	.20	.18	.38 ^a	.14	.27 ^b	.36 ^a	-.34 ^a	.19	-.18	.06	-.04	.34 ^a	.19
2. FFMQ-O		.29 ^b	.48 ^a	.31 ^a	.43 ^a	.72 ^a	-.33 ^a	-.05	-.38 ^a	.34 ^a	-.33 ^a	.41	.31 ^a
3. FFMQ-D			.37 ^a	.21	.31 ^a	.66 ^a	-.36 ^a	-.05	-.17	.42 ^a	-.37 ^a	.35	.31 ^a
4. FFMQ-AA				.46 ^a	.13	.74 ^a	-.50	-.06	-.37 ^a	.34 ^a	-.40 ^a	.44	.47 ^a
5. FFMQ-NJ					.07	.64 ^a	-.53 ^a	-.13	-.38 ^a	.44 ^a	-.34 ^a	.39 ^a	.55 ^b
6. FFMQ-NR						.55 ^a	-.18	-.11	-.18	.17	-.18	.19	.29 ^b
7. FFMQ-G							-.58 ^a	-.12	-.45 ^a	.52 ^a	-.49 ^a	.54	.59 ^a
8. PBO								.29 ^b	.51 ^a	-.51 ^a	.49 ^a	-.36	-.44 ^a
9. PI									.32 ^a	-.20	.33 ^a	-.03	-.13
10. PC										-.23	.59 ^a	-.22	-.35 ^a
11. BR												-.41 ^a	.39 ^a
12. SHC													-.43 ^a
13. SOM													
14. S-E													.41 ^a

Note: WAS, Work Ability Score; FFMQ, Five Facet Mindfulness Questionnaire; FFMQ-O, FFMQ-Observe; FFMQ-D, FFMQ-Describe; FFMQ-AA, FFMQ-Act Aware; FFMQ-NJ, FFMQ-Nonjudge; FFMQ-NR, FFMQ-Nonreact; FFMQ-G, FFMQ-Global; PBO, personal burn out; PI, pain intensity; PC, pain consequences; SHC, subjective health complaints; SOM, sense of mastery; BR, body responsiveness; S-E, self-esteem.

^aCorrelation is significant at the $p < .01$ level (two-tailed).

^bCorrelation is significant at the $p < .05$ level (two-tailed).

predictors on the mediator; a path in Figure 1), all predictors, except for pain intensity, independently predicted change in the mindfulness score. More explicitly, burnout, pain consequences, and subjective health complaints were inversely related to change in mindfulness, whereas body responsiveness, sense of mastery, and self-esteem were positively related to change in mindfulness.

The outcome model – predicting WA response

When investigating the total effects (i.e. before considering the mediator; “c path” in Figure. 1) of the predictors of WA response, decreased personal burnout and enhanced self-esteem were both unique predictors of a positive WA response. After including the mediator, however, no direct effect (c’ path in Figure. 1) remained statistically significant. Mindfulness predicted a positive WA response. Increased self-esteem explained 38% of the variation in WA response, whereas decreased personal burnout explained 34% of the variation in WA response.

Indirect effects on WA response through mindfulness

The possible indirect effects of multiple predictors on WA response through mindfulness were investigated. All indirect paths were significant (bias-corrected CI did not include zero) except for pain intensity (Table 4). In other words, higher sense of mastery and self-esteem predicted higher WA through enhanced mindfulness. Furthermore, decreased personal burnout, pain consequences, and SHC predicted higher mindfulness, which in turn predicted higher WA.

Discussion

The study aim was to investigate whether changes in mindfulness level predict a successful WA response and to examine the effects of an MVRP on WA response through

Table 4. Investigating indirect effects. Dependent variable: WA response.

	Mediator model	Outcome model				
		Total	Direct	Indirect		
				PE(SE)	LL	UL
					BC 95% CI	
Model 1	PE(SE)	PE(SE)	PE(SE)	PE(SE)	LL	UL
PBO (X)	-.091 (.016)**	-.037 (.016)*	-.014 (.019)	-.028 (.018)	-.071	-.003
FFMQ-G (M)			.309 (.130)*			
Age			-.045 (.029)			
Sex			1.329 (.755)			
Model 2						
PI (X)	-.064 (.058)	.024 (.041)	.054 (.050)	-.023 (.036)	-.116	.016
FFMQ-G (M)			.358 (.119)*			
Age			-.039 (.029)			
Sex			1.350 (.745)			
Model 3						
PC (X)	-.077 (.018)**	-.022 (.015)	.0002 (.017)	-.026 (.015)	-.062	-.006
FFMQ-G (M)			.342 (.127)**			
Age			-.045 (.029)			
Sex			1.196 (.735)			
Model 4						
BR (X)	.243 (.049)**	.015 (.040)	-.088 (.054)	.112 (.053)	.041	.235
FFMQ-G (M)			.460 (.142)**			
Age			-.068 (.032)			
Sex			1.091 (.755)			
Model 5						
SHC (X)	-.268 (.059)**	-.044 (.047)	.045 (.061)	-.103 (.061)	-.251	-.026
FFMQ-G (M)			.386 (.129)**			
Age			-.048 (.029)			
Sex			1.221 (.733)			
Model 6						
SOM (X)	.406 (.079)**	.104 (.070)	-.034 (.087)	.153 (.076)	.046	.334
FFMQ-G (M)			.376 (.137)**			
Age			-.047 (.029)			
Sex			1.215 (.734)			
Model 7						
S-E (X)	.302 (.042)**	.097 (.047)*	.009 (.059)	.103 (.070)	.016	.263
FFMQ-G (M)			.339 (.137)*			
Age			-.046 (.029)			
Sex			1.235 (.736)			

Note: Dependent variable (DV): WA response (1 = WA-responders, 0 = WA-nonresponders); X, independent variable (IV); M, mediator; PBO, personal burn out; PI, pain intensity; PC, pain consequences; BR, body responsiveness; SHC, subjective health complaints; SOM, sense of mastery; S-E, self-esteem; FFMQ-G, Five Facet Mindfulness Questionnaire-Global; mediator model, effect of IV on M, "a path"; outcome model, effect of IV and M on DV; PE(SE), bootstrapped point estimate (standard deviation); total effect, effect of IV on DV (before considering the M, "c path"); direct effect, effect of IV on DV (not via the M, "c path"); indirect effect, effect of IV on DV through M, "ab path"; BC 95% CI, bias-corrected 95% confidence interval (BC confidence interval not including zero in bold). Model 1: $R^2 = .34$, $F = 12.27$, $p < .01$. Model 2: $R^2 = .06$, $F = 1.35$, $p > .05$. Model 3: $R^2 = .24$, $F = 7.11$, $p < .01$. Model 4: $R^2 = .29$, $F = 9.57$, $p < .01$. Model 5: $R^2 = .26$, $F = 8.15$, $p < .01$. Model 6: $R^2 = .30$, $F = 10.19$, $p < .01$. Model 7: $R^2 = .38$, $F = 14.01$, $p < .01$.

**Statistically significant ($p < .01$) point estimate.

*Statistically significant ($p < .05$) point estimate.

mindfulness. Our data indicate that WA-responders improved significantly on all facets of mindfulness except for the facet of nonreactivity, while WA-nonresponders did not improve on any of the five facets of mindfulness. Mindfulness stands out as a strong predictor of WA response in our tests (see Table 4). This is consistent with previous research on the effects of mindfulness on depression and anxiety (De Vibe et al., 2012), stress and burnout (Cohen-Katz et al., 2005), and pain (Esmer et al., 2010), all of which are health conditions associated with poor WA and responsible for most long-term sick leave

(Brage et al., 2010; Hagen, 2006; Ihlebaek et al., 2007; OECD, 2013). Moreover, the present findings expand on previous work by identifying the direct effect of mindfulness on WA response.

As shown in Table 1, WA-nonresponders did not enhance their mindfulness over the course of the program as measured by any facet of the FFMQ. A recently published study on this sample (Vindholmen, Haugen, Høigaard, & Seiler, 2015), revealed that, at baseline, the WA-nonresponders demonstrated significantly higher pain intensity level and lower sense of mastery than WA-responders. Therefore, it is possible that high pain intensity, low sense of mastery, or the combination of these two factors in the WA-nonresponder group at baseline made them less capable of learning and practicing mindfulness. Previous research has identified cognitive impairment associated with pain as a major obstacle to rehabilitation (Moriarty, McGuire, & Finn, 2011). Furthermore, perceived control or sense of mastery is associated with a variety of successful outcomes (e.g. vocational rehabilitation, health, motivation, self-esteem, and achievement) (Millet, 2005; Selander, Marnetoft, & Åsell, 2007; Skinner, 1996). Unfortunately, there is a lack of knowledge about the relationship between pain intensity, sense of mastery/control, mindfulness, and WA. A longitudinal controlled cohort study is needed to broaden knowledge about this relationship.

When testing whether changes in personal health factors predict WA response, as shown in Table 4, both self-esteem and personal burnout were significant, independent predictors of WA response; a significant total effect on WA was also identified. An examination of the indirect effect of rehabilitation outcome on WA response through mindfulness found that mindfulness mediated the effect of both personal burnout and self-esteem on WA response. In other words, WA was positively affected through mindfulness when individuals experienced decreased personal burnout and/or enhanced self-esteem. The important effect of mindfulness training on burnout and self-esteem has previously been documented (Brown & Ryan, 2003; Cohen-Katz et al., 2005). Furthermore, the results of the present research add to the literature showing that both decreased personal burnout and increased self-esteem significantly and independently predict WA response during an MVRP. Changes in the independent variables burnout and self-esteem showed negative correlations in our sample (Table 3), underlining the intertwined nature of these concepts, or that one aspect of burnout may be diminished self-esteem (Gold & Roth, 1993).

In the present study, the effect of decreased personal burnout and/or increased self-esteem on WA response was mediated by mindfulness (Table 4). One explanation for how mindfulness mediates the relationship between personal burnout and WA response may be the strong focus on experiencing and accepting what was taking place in the present moment, both inside and outside the person, and this shift in focus may have released positive energy and decreased burnout. Brown and Ryan (2003) argue that individuals with greater mindfulness experience less stress and greater subjective well-being. In the present study, the results in Table 3 show that the personal burnout variable correlated negatively with the FFMQ-observe variable, which refers to giving one's attention to internal and external experiences such as sensations, cognitions, emotions, sights, sounds, and smells. In other words, decreased personal burnout is related to enhanced attention to internal and external experiences. This agrees with several researchers (Hölzel et al., 2011)

who have highlighted attention regulation as an especially important mechanism of mindfulness.

Furthermore, the results in [Table 4](#) show that mindfulness mediates the relationship between self-esteem and WA response. These results are in accordance with Ryan and Brown (2003), who argue that when provided mindfulness training and teaching, individuals will become more attentive to what is taking place in the present moment and in turn less concerned in esteeming the self. Furthermore, self-esteem will increase in such circumstances and, in turn, when esteeming the self is not a concern, individuals can more easily release their attention and energy to focus on the right responses, all things considered. Taking a closer look, the correlations between change variables in the present study (see [Table 3](#)) show that self-esteem is positively correlated with all FFMQ facets (i.e. observe, describe, act aware, nonreact, and nonjudge) and positively correlated with WAS.

The present study identified an indirect effect of body responsiveness on WA through mindfulness; that is, a higher level of body responsiveness predicted a higher level of mindfulness, which in turn predicted a higher level of WA. We are hopeful that these results will encourage further, prospective studies exploring these connections. Many mechanisms may cooperate in this process. In the present study a high negative correlation was found between changes in body responsiveness and changes in personal burnout (see [Table 3](#)). More specifically, enhanced body responsiveness is related to decreased burnout. Moreover, body responsiveness correlates positively with self-esteem. That is, enhanced body responsiveness is related to enhanced self-esteem. This finding is in line with Hölzel et al. (2011), who suggest that enhanced body awareness may be closely related to changes in one's perspective on oneself and may replace a narrative form of self-reference. Additionally, enhancement of body awareness may have relevance for affect regulation. Further research in this area should emphasize and explore the role of body awareness and body responsiveness in vocational rehabilitation.

Furthermore, an indirect effect of sense of mastery on WA response through mindfulness was identified; that is, an enhanced sense of mastery predicted an enhanced mindfulness level, which in turn predicted higher WA. Only tentative conclusions can be drawn, and hopefully this finding will encourage further exploration of the constructs of control, mindfulness, and WA in a prospective study. Lack of control is regarded as a hindrance in vocational rehabilitation (Millet, 2005), and knowledge about mechanisms by which control may be enhanced is needed to optimize vocational rehabilitation. A positive correlation was observed between changes in sense of mastery and changes in WAS ([Table 3](#)). More explicitly, an enhanced sense of mastery is related to an increased WA. Furthermore, a positive correlation was found between changes in sense of mastery and changes in body responsiveness, indicating that enhanced body responsiveness is related to enhanced sense of mastery. This finding may indicate that by learning to value their body's feedback and being trained in "listening" to the sensations of their bodies for guidance, individuals experience a greater ability to control and influence their life situation. Changes in sense of mastery also correlated positively with changes in self-esteem. In other words, enhanced sense of mastery is related to enhanced self-esteem. Enhancing these two dimensions of self-concept might buffer against stress; Pearlin et al. (1981) argue that life events and chronic strains are more likely to cause stress when they also result in a diminishment of self (e.g. sense of mastery and self-esteem).

Only change in pain intensity had a nonsignificant indirect effect on WA response. Whether pain intensity moderates both the direct effect and the mediating effect of mindfulness on WA response should be investigated in a prospective, longitudinal study.

Strengths and limitations

A major strength of the study is its ecological validity. This study builds on data from individuals referred to an existing governmental program, funded by the NLWA. However, the present study must also be seen in light of its limitations. Assessing the change in the independent variables, the change in the mediator and the change in the outcome (WA-response) took place simultaneously. Therefore, the mediation analyses have the limitations associated with cross-sectional studies. A prospective, controlled design is needed to establish clear indices of direction of causality. However, in accordance with Hayes' (Hayes, 2013) recommendations, limitations in the data collection efforts did not constrain the statistical tools chosen to analyze what the data revealed about the process studied. Therefore, a major strength of this work is the statistical tools utilized. The bootstrapping technique has higher power while maintaining acceptable control over type 1 errors and is therefore recommended over the Sobel test (MacKinnon, Lockwood, Hoffman, West, & Sheets, 2002).

In the present study, the outcome variable (WAS change) was dichotomized between WA-responders and WA-nonresponders in order to answer our research question. When conducting the mediation analyses using the continuous WAS change as the dependent variable, the results supported similar conclusions (see [appendix](#)). All indirect effects were the same, but when investigating the total effects, sense of mastery was a unique predictor of WAS change, and self-esteem not ([Table A1](#)). This should be considered when interpreting the results because dichotomization of continuous variables may yield misleading conclusions (Babyak, 2004). However, in the present sample, an important assumption underlying linear regression, normal distribution of the WAS change variable, was violated. As such, we argue that also from a statistical point of view, logistic regression was preferable. Additionally, bootstrapping is considered most appropriate to test mediation with small samples and dichotomous variables (Preacher & Hayes, 2004; Shrout & Bolger, 2002). Moreover, in the present sample self-esteem and sense of mastery display a positive correlation ([Tables 2 and 3](#)), and researchers have suggested that the concept of self-esteem and the concept of perceived control or sense of mastery perhaps are indicators of a common core construct (Judge, Erez, Thoresen, & Bono, 2002; Skinner, 1996).

Because there are few data available within the research literature providing insight into the relationship between mindfulness and WA, the theoretical foundation for the causal order between these two variables might be limited. Mathieu and Taylor (2006) argue that without an experimental or longitudinal design, one might test a mediation model on the basis of the theoretical ordering of variables, and that specification of the causal order of variables in mediational relationships is first and foremost a theoretical exercise.

A key limitation of the present study is that we have not controlled for multiple independent variables, for example, personal health factors, in testing the main effects. This is because multiple mediation analyses were performed, and thus it is not possible to estimate the portion of one predictor X's effect on outcome Y (directly or indirectly

through M) that is unique to that X relative to the other Xs in the model. In the present study the independent variables canceled each other out when included in one model, and therefore multiple mediation analyses, each with a single X, were preferred. As shown in Table 3, the independent variables for personal health factors (Xs) were highly correlated in our sample. This, according to Hayes (2013), is the danger in including multiple Xs in a mediation model: highly correlated Xs may cancel out each other's effects. However, when several models are estimated, each focusing on a single independent variable, the results then yield an estimate of X's direct and indirect effects on Y and, potentially, the effects of other Xs which are not included and controlled for in the model. Either approach is legitimate, yet both sets of results should be interpreted with caution (Hayes, 2013).

The study lacked strict randomization because we did not have the opportunity to influence the assignment of individuals to the program. However, the individuals represent all participants seen over a period of time. Since the population sampled in this study were all on long-term sick leave, generalization to other settings is limited.

Conclusion

A better understanding of the mechanisms that may induce a positive WA response is important for the development of optimal intervention programs in vocational rehabilitation. These results suggest that enhancing mindfulness skills may be important for improving WA. Enhanced mindfulness over the course of the program significantly predicted a successful WA response. Furthermore, decreased burnout and enhanced self-esteem were both unique predictors of a positive WA response. Mindfulness mediated the effects of personal burnout and self-esteem on participants' WA response. Both enhanced body awareness and sense of mastery, and decreased pain consequences and SHC, are indirectly related to successful WA response through increased mindfulness. This study provides empirical justification for longitudinal studies and randomized controlled trials to assess the causal direction of these relationships.

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Appendix

Table A1. Investigating indirect effects. Dependent variable: WAS change ($N = 74$).

Mediator model		Outcome model				
		Total	Direct	Indirect		
				BC 95% CI		
	PE(SE)	PE(SE)	PE(SE)	PE(SE)	LL	UL
Model 1						
PBO (X)	-.091 (.022)**	-.053 (.017)**	-.032 (.021)	-.021 (.011)	-.048	-.004
FFMQ-G (M)			.234 (.109)*			
Age			-.012 (.029)			
Sex			1.045 (.710)			
Model 2						
PI (X)	-.064 (.080)	.085 (.054)	.108 (.054)	-.023 (.031)	-.098	.015
FFMQ-G (M)			.368 (.093)**			
Age			.001 (.031)			
Sex			1.084 (.745)			
Model 3						
PC (X)	-.077 (.020)**	-.028 (.017)	.003 (.017)	-.026 (.010)	-.049	-.010
FFMQ-G (M)			.342 (.127)**			
Age			-.045 (.029)			
Sex			1.196 (.735)			
Model 4						
BR (X)	.243 (.077)**	.031 (.059)	-.073 (.055)	.104 (.053)	.045	.206
FFMQ-G (M)			.428 (.112)**			
Age			-.030 (.032)			
Sex			.704 (.745)			
Model 5						
SHC (X)	-.268 (.082)**	-.023 (.072)	.090 (.072)	-.113 (.041)	-.213	-.046
FFMQ-G (M)			.423 (.125)**			
Age			-.015 (.031)			
Sex			.857 (.730)			
Model 6						
SOM (X)	.406 (.104)**	.253 (.071)**	-.156 (.079)	.097 (.052)	.021	.199
FFMQ-G (M)			.376 (.137)**			
Age			-.047 (.029)			
Sex			1.215 (.734)			
Model 7						
S-E (X)	.302 (.063)**	.093 (.066)	.017 (.082)	.110 (.046)	.037	.216
FFMQ-G (M)			.365 (.128)**			
Age			-.014 (.031)			
Sex			.889 (.738)			

Notes: Dependent variable (DV): WAS change; X, independent variable (IV); M, Mediator; PBO, Personal Burn Out; PI, Pain Intensity; PC, Pain Consequences; BR, Body Responsiveness; SHC, Subjective Health Complaints; SOM, Sense of Mastery; S-E, Self-Esteem; FFMQ-G, Five Facet Mindfulness Questionnaire-Global; mediator model, effect of IV on M, “a path”; outcome model, effect of IV and M on DV; PE(SE), bootstrapped point estimate (standard deviation); total effect, effect of IV on DV (before considering the M, “c path”); direct effect, effect of IV on DV (not via the M, “c path”); indirect effect, effect of IV on DV through M, “ab path”; BC 95% CI, bias-corrected 95% confidence interval (BC confidence interval not including zero in bold). Model 1: $R^2 = .34$, $F = 7.32$, $p < .01$. Model 2: $R^2 = .06$, $F = 1.46$, $p > .05$. Model 3: $R^2 = .24$, $F = 5.87$, $p < .01$. Model 4: $R^2 = .29$, $F = 4.31$, $p < .01$. Model 5: $R^2 = .26$, $F = 4.54$, $p < .01$. Model 6: $R^2 = .30$, $F = 5.94$, $p < .01$. Model 7: $R^2 = .38$, $F = 8.56$, $p < .01$.

**Statistically significant ($p < .01$) point estimate.

*Statistically significant ($p < .05$) point estimate.

The mediator model – predicting mindfulness

In Table A1 data concerning the effect of rehabilitation outcome on WAS change through mindfulness are shown. When assessing the mediator model (i.e. the effect of the predictors on the

mediator; a path in [Figure 1](#)), all predictors, except for pain intensity, independently predicted change in the mindfulness score. More specifically, sense of mastery, self-esteem, and body responsiveness were positively related to change in mindfulness, whereas burnout, pain consequences, and subjective health complaints were inversely related to change in mindfulness.

The outcome model – predicting WAS change

When analyzing the total effects (i.e. before considering the mediator; c-path in [Figure 1](#)) of the predictor on the WAS change variable, decreased personal burnout and enhanced sense of mastery were both unique predictors of a positive WAS change response. However, after including the mediator, no direct effect (c' path in [Figure 1](#)) remained statistically significant. Mindfulness predicted a positive WAS change response. Increased sense of mastery explained 30% of the variation in WAS change, whereas personal burnout explained 34% of the variation in WAS change.

Indirect effects on WAS change through mindfulness

The potential indirect effects of multiple predictors on WAS change through mindfulness were analyzed. All indirect paths were significant (bias-corrected CI did not include zero) except for pain intensity ([Table A1](#)). In other words, decreased personal burnout, pain consequences, and SHC predicted higher mindfulness, which in turn predicted higher WAS change. Furthermore, higher sense of mastery and self-esteem predicted higher WAS change through enhanced mindfulness.

Appendix I

PIA@

Personer i Aktivitet og Arbeid

- en studie med fokus på virksomme elementer i Arbeidsrettet Rehabilitering ved Durapart



Hva er PIA@ - undersøkelsen?

PIA@ er en studie som undersøker virksomme elementer i Arbeidsrettet Rehabilitering ved Durapart. Undersøkelsen har sitt viktigste fokus i å utforske hva som skal til for å få mennesker mer aktive og tilbake i arbeid. Studien er et doktorgradsprosjekt i Arbeidsrettet Rehabilitering og undersøkelsen skjer i regi av Universitetet i Agder.

Det er behov for mer kunnskap om faktorer og mekanismer som fremmer arbeidsmotivasjon, livskvalitet og god arbeidsevne. Aust Agder fylkeskommune har bevilget penger til å forske på Durapart sitt Arbeidsrettet Rehabiliterings-kurs. Kunnskapen som kommer ut av dette prosjektet vil brukes til å utvikle og forbedre arbeidsrettede rehabiliteringskurs lokalt, nasjonalt og internasjonalt.

Bakgrunnen for ønske om økt kunnskap på området er at antall personer som blir sykemeldte eller uføre pga. sammensatte plager, slik som muskel-/skjelett lidelser, smertetilstander og/eller psykiske lidelser, har økt de senere år. Erfaring og forskning tyder på at tverrfaglig rehabilitering fungerer bra nettopp i de tilfeller hvor helseplagene er sammensatte. Arbeidsrettet Rehabilitering (ARR) er et arbeidsmarkeds kurs som tilbys sykemeldte personer og personer med nedsatt arbeidsevne. ARR kombinerer helserettet rehabilitering med arbeidsrettet fokus og gjennomføres av et tverrfaglig team.

Hva innebærer deltakelse i undersøkelsen for deg?

Deltakelse i undersøkelsen innebærer at du svarer på et spørreskjema. Det tar ca. 20 minutter å fylle ut dette skjemaet.

Du kan du velge mellom to alternative måter for å besvare spørreskjemaet:

- A. Penn og papir-metoden. Velger du dette alternativet vil du få spørreskjemaet tilsendt i posten. Du svarer på undersøkelsen ved å fylle ut spørreskjemaet og returnere det i en vedlagt svarkonvolutt
- B. Undersøkelsen kan besvares på internett. Velger du dette alternativet vil du få tilsendt en link til spørreskjemaet via e-post. Du får spørreskjemaet opp på skjermen ved å klikke på linken. Og du svarer på undersøkelsen ved å følge instruksjonen underveis.

Villig til å delta.....?

Velger du å delta i PIA@ undersøkelsen bidrar du med viktig og ny kunnskap om arbeidsrettet rehabilitering.

Fordeler og ulemper

Deltakelse i undersøkelsen innebærer ingen risiko for din helse. Det er hverken fordeler eller ulemper ved å delta, og det innebærer ingen kostnad for deg som person å delta i undersøkelsen.

Hva skjer med informasjonen om deg?

All informasjonen som samles inn om deg vil bli behandlet i henhold til gjeldende lover og forskrifter. Alle medarbeidere involvert i undersøkelsen har taushetsplikt, og opplysningene vil kun bli brukt til godkjente forskningsformål. Prosjektet forventes avsluttet 31.12.2017. På grunn av oppfølgingsarbeid og artikkelskriving er det ønskelig å beholde informasjonen aidentifisert frem til 31.12.2020. Alle personopplysninger anonymiseres senest 31.12.2020. Det vil ikke være mulig å identifisere deg i resultatene av studien når disse publiseres.

Frivillig deltakelse

Det er frivillig å delta i undersøkelsen. Dersom du ønsker å delta i undersøkelsen så er det viktig at du **underteigner samtykkeerklæringen på siste side og returnerer i vedlagte svarkonvolutt**. Du kan når som helst trekke deg uten å oppgi noen grunn. Har du spørsmål til studien, kan du kontakte:
solveig.vindholmen@uia.no / mob. 99460380

Hvem kan delta?

Alle som har deltatt på Arbeidsrettet Rehabilitering (ARR) og/eller Helse- og Rehabiliteringstjenester (HRT) ved Durapart i perioden 2007-2012 kan delta i studien. Det arbeides i prosjektet med å få muligheten til å kontakte en matchet kontrollgruppe. Til en matchet kontrollgruppe vil personer som er mest mulig lik gruppen som har deltatt på ARR/HRT bli forespurt om deltakelse.

Tidsplan

I august sendes informasjonsskriv og samtykkeerklæring til alle tidligere deltakere ved Arbeidsrettet Rehabilitering på Durapart i tidsrommet 2007-2011. Denne delen av undersøkelsen skjer kun pr. post / internett, og kalles PIA@1.

Personvern

Undersøkelsen er godkjent av personvernombudet for forskning, Norsk samfunnsvitenskaplig datatjeneste A/S.

Opplysninger som registreres om deg er basert på de spørreskjema du selv velger å fylle ut og gir ditt samtykke til at kan benyttes i studien. Slik vil du selv kunne velge hvilken informasjon om deg som blir tilgjengelig for forskerne i prosjektet. Det presiseres at det kun er prosjektleder og

hennes faglige veileder som vil ha tilgang til innsamlede personopplysninger.

Innsamlede opplysninger oppbevares slik at navn er erstattet med en kode som viser til en atskilt navneliste. Det er kun prosjektleder og faglig veileder som har adgang til navnelisten og som kan finne tilbake til deg. Det vil ikke være mulig å identifisere deg i resultatene av undersøkelsen når disse publiseres.

Retten til innsyn og sletting av opplysninger om deg

Hvis du sier ja til å delta i undersøkelsen, har du rett til å få innsyn i hvilke opplysninger som er registrert om deg. Du har videre rett til å få korrigert eventuelle feil i de opplysningene vi har registrert. Dersom du trekker deg fra undersøkelsen kan du kreve å få slettet innsamlede opplysninger, med mindre opplysningene allerede har inngått i analyser eller brukt i vitenskapelige publikasjoner.

Økonomi og Duraparts rolle

Studien er finansiert gjennom forskningsmidler fra Durapart.



Samtykke

Jeg har lest informasjonsskrivet om undersøkelsen "Personer i Aktivitet og Arbeid" og er kjent med at opplysningene jeg gir vil bli behandlet strengt fortrolig.

Deltakelse i undersøkelsen "Personer i Aktivitet og Arbeid" innebærer følgende:

- at jeg fyller ut undersøkelsens spørreskjema (tidsbruk ca 20 minutter). Jeg velger selv om jeg vil ha tilsendt en papirutgave av spørreskjemaet eller om jeg vil svare på undersøkelsen via internett.
- at PIA@-undersøkelsen har min tillatelse til å benytte informasjonen fra spørreskjemaet om Livskvalitet som jeg fylte ut første og siste uke av kurset på Durapart
- at jeg på et hvilket som helst tidspunkt kan trekke meg fra videre deltakelse ved å kontakte: solveig.vindholmen@uia.no.

**Jeg har lest informasjonen og samtykker i å delta i undersøkelsen
"Personer i Aktivitet og Arbeid"**

Navn: _____

Adresse: _____

Dato: _____ Underskrift: _____

Vennligst kryss av i én av boksene under for hvordan du ønsker å svare på undersøkelsen:

- Jeg ønsker få tilsendt en papirutgave av spørreskjemaet i posten, som jeg fyller ut og returnerer i en vedlagt svarkonvolutt.
- Jeg ønsker å svare på undersøkelsen via internett, og få tilsendt link til undersøkelsen på e-post.
Min e-postadresse er:.....

Jeg bekrefter å ha gitt informasjon om undersøkelsen:

Solveig Vindholmen

Doktorgradsstipendiat, Solveig Vindholmen
Institutt for Psykososial Helse
Universitetet i Agder

Appendix II

PIA@

Personer i Aktivitet og Arbeid

- en studie med fokus på virksomme elementer i Arbeidsrettet Rehabilitering ved Durapart



Hva er PIA@ - undersøkelsen?

PIA@ er en studie som undersøker virksomme elementer i Arbeidsrettet Rehabilitering ved Durapart. Undersøkelsen har sitt viktigste fokus i å utforske hva som skal til for å få mennesker mer aktive og tilbake i arbeid. Studien er et doktorgradsprosjekt i Arbeidsrettet Rehabilitering og undersøkelsen skjer i regi av Universitetet i Agder.

Det er behov for mer kunnskap om faktorer og mekanismer som fremmer arbeidsmotivasjon, livskvalitet og god arbeidsevne. Aust Agder fylkeskommune har bevilget penger til å forske på Durapart sitt Arbeidsrettet Rehabiliterings-kurs. Kunnskapen som kommer ut av dette prosjektet vil brukes til å utvikle og forbedre arbeidsrettede rehabiliteringskurs lokalt, nasjonalt og internasjonalt.

Bakgrunnen for ønske om økt kunnskap på området er at antall personer som blir sykemeldte eller uføre pga. sammensatte plager, slik som muskel-/skjelett lidelser, smertetilstander og/eller psykiske lidelser, har økt de senere år. Erfaring og forskning tyder på at tverrfaglig rehabilitering fungerer bra nettopp i de tilfeller hvor helseplagene er sammensatte. Arbeidsrettet Rehabilitering (ARR) er et arbeidsmarkeds kurs som tilbys sykemeldte personer og personer med nedsatt arbeidsevne. ARR kombinerer helserettet rehabilitering med arbeidsrettet fokus og gjennomføres av et tverrfaglig team.

Hva innebærer deltakelse i undersøkelsen for deg?

Deltakelse i undersøkelsen innebærer at du svarer på et spørreskjema før og etter ARR-kurset (pretest og posttest). Det tar ca. 20 minutter å fylle ut hvert skjema.

Du kan du velge mellom to alternative måter for å besvare spørreskjemaene:

- A. Penn og papir-metoden. Du svarer på undersøkelsen ved å fylle ut spørreskjema og returnere det i en vedlagt svarconvolutt
- B. Undersøkelsen kan besvares på internett. Velger du dette alternativet vil du få tilsendt en link til spørreskjemaet via e-post. Du får spørreskjemaet opp på skjermen ved å klikke på linken. Og du svarer på undersøkelsen ved å følge instruksjonen underveis.

Deltakelse innebærer videre at du vil få tilsendt spørreskjema etter 6 måneder og 12 måneder. Du velger da selv om du vil ha tilsendt nettbasert spørreskjema via e-post eller få tilsendt en papirutgave av spørreskjemaet via vanlig post.

Villig til å delta.....?

Velger du å delta i PIA@ undersøkelsen bidrar du med viktig og ny kunnskap om arbeidsrettet rehabilitering.

Fordeler og ulemper

Deltakelse i undersøkelsen innebærer ingen risiko for din helse. Det er hverken fordeler eller ulemper ved å delta, og det innebærer ingen kostnad for deg som person å delta i undersøkelsen.

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All informasjonen som samles inn om deg vil bli behandlet i henhold til gjeldende lover og forskrifter. Alle medarbeidere involvert i undersøkelsen har taushetsplikt, og opplysningene vil kun bli brukt til godkjente forskningsformål. Prosjektet forventes avsluttet 31.12.2017. På grunn av oppfølgingsarbeid og artikkelskriving er det ønskelig å beholde informasjonen aidentifisert frem til 31.12.2020. Alle personopplysninger anonymiseres senest 31.12.2020. Det vil

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solveig.vindholmen@uia.no /
mob.99460380

Hvem kan delta?

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Tidsplan

Høsten 2011 starter datainnsamling i intervensjonsstudien som kalles PIA@2, og nye deltakere ved ARR-kurs på Durapart vil fortløpende forespørres om deltakelse i studien.

Personvern

Undersøkelsen er godkjent av personvernombudet for forskning, Norsk samfunnsvitenskaplig datatjeneste A/S. Opplysninger som registreres om deg er basert på de spørreskjema du selv velger å fylle ut og gir ditt samtykke til at kan benyttes i studien. Slik vil du selv kunne velge hvilken informasjon om deg som blir tilgjengelig for forskerne i prosjektet. Det presiseres at det kun er prosjektleder og

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Økonomi og Duraparts rolle

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Samtykke

Jeg har lest informasjonsskrivet om undersøkelsen "Personer i Aktivitet og Arbeid" og er kjent med at opplysningene jeg gir vil bli behandlet strengt fortrolig.

Deltakelse i undersøkelsen "Personer i Aktivitet og Arbeid" innebærer følgende:

- at jeg fyller ut et spørreskjema når ARR-kurset starter opp, ved kursets avslutning, etter 6 måneder og 12 måneder. Det tar ca. 20 minutter å fyller ut et spørreskjema. Jeg velger selv om jeg vil besvare papirutgave av spørreskjemaene som jeg returnerer i vedlagt svarkonvolutt, eller om jeg vil svare på undersøkelsen via internett.
- at PIA@-undersøkelsen har min tillatelse til å benytte informasjonen fra spørreskjemaet om Livskvalitet som jeg fyller ut første og siste uke av kurset på Durapart
- at jeg på et hvilket som helst tidspunkt kan trekke meg fra videre deltakelse ved å kontakte: solveig.vindholmen@uia.no.

**Jeg har lest informasjonen og samtykker i å delta i undersøkelsen
"Personer i Aktivitet og Arbeid"**

Navn: _____

Adresse: _____

Dato: _____ Underskrift: _____

Vennligst kryss av i én av boksene under for hvordan du ønsker å svare på undersøkelsen:

- Jeg ønsker få utdelt/tilsendt en papirutgave av spørreskjemaet, som jeg fyller ut og returnerer i en vedlagt svarkonvolutt.
- Jeg ønsker å svare på undersøkelsen via internett, og få tilsendt link til undersøkelsen på e-post.
Min e-postadresse er:.....

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Solveig Vindholmen

Doktorgradsstipendiat, Solveig Vindholmen
Institutt for Psykososial Helse
Universitetet i Agder

Appendix III

Appendix III: Questionnaires in Papers I-III

Bakgrunnskunnskap studie 1

1. Kjønn: Mann Kvinne

2. Fødselsår: (åååå – f.eks. 1965)

3. Fødeland:

4 a) Sivilstatus: Enslig Gift/samboer Enke/enkemann Skilt/Separert

4 b) Bostatus: Alene Egen familie/samboer Oppvekstfamilie/foreldre Bor sammen med andre

5 a) Arbeids – og stønadssituasjon

Under følger en rekke påstander relatert til din arbeids - og stønadssituasjon i dag. Kryss av alle de påstandene som passer for deg. **Flere svaralternativer er mulig.**

- Jeg er i jobb, helt eller delvis
- Jeg er sykemeldt, helt eller delvis
- Jeg deltar i arbeidstrening
- Jeg deltar i rehabilitering
- Jeg mottar arbeidsavklaringspenger
- Jeg går på skole / tar utdanning
- Jeg er registrert som arbeidssøker
- Jeg mottar uførestønad
- Jeg har søkt uførepensjon
- Andre tiltak (Spesifiser: _____)
- Andre stønader: (Spesifiser: _____)

5 b) Hovedinntektskilde:

- Ordinær lønn Sykepenger Arbeidsavklaringspenger
- Kvalifiseringsstønad Sosialstønad Annet: (Spesifiser: _____)

6 a) Sykefravær og arbeid

Hvor mange dager har du samlet vært borte fra jobb de siste 6 måneder grunnet egen sykdom?: _____

6 b) Hvis du har hatt sykefravær de siste 6 månedene, hva er hovedgrunnen til ditt sykefravær?:

6 c) Hvis du har hatt sykefravær de siste 6 månedene, i hvilken grad skyldes det:

	<i>I høy grad</i>	<i>I noen grad</i>	<i>I liten grad</i>	<i>Ikke i det hele tatt</i>
<i>Fysisk arbeidspress:</i>	1	2	3	4
<i>Psykisk arbeidspress:</i>	1	2	3	4

7 a) Hvordan opplever du husholdningens økonomiske situasjon? Uanstrengt Anstrengt

7 b) Hva er din egen brutto inntekt per år? _____

8. Hvor mange barn har du?

- 0 1 2 3 4 Flere enn 4

9. Dersom du har barn: Hvor mange av dine barn bor hjemme?

- 0 1 2 3 4 Flere enn 4

Appendix III: Questionnaires in Papers I-III

10. Opplever du omsorgsoppgaver i eller utenfor familien som energikrevende og/eller belastende?

- ja, i stor grad
- Ja, i liten grad
- Nei
- Har ikke omsorgsoppgaver

11. Opplever du vansker med lesing og skriving?

- Ja
- Til en viss grad
- Nei

12. Utdanning (Sett kryss ved den høyeste utdannelsen du har fullført)

- Ikke fullført 9/10-årig grunnskole
- 9/10 årig grunnskole
- Videregående skole
- Høgskole eller Universitet (lavere grad eller bachelor)
- Høyere universitetsgrad (på hovedfags-/Masternivå eller høyere)

13. Når gjennomførte du Arbeidsrettet Rehabiliteringskurset på Durapart?

Våren- høsten/år(0000):.....

14. Hva var hovedgrunnen til at du var innsøkt på Durapart? _____

15. a) Hadde du en diagnose fra lege? Ja Nei

b) Hvis Ja: Hvilken Diagnose hadde du fått fra lege?:.....

16. Det som var viktig for meg ved arbeidsrehabiliteringskurset på Durapart var:

17. Det som kunne vært bedre for meg ved arbeidsrehabiliteringskurset på Durapart var:

18. Oppmerksomhetstrening

Da du gjennomførte arbeidsrehabiliteringskurset på Durapart fikk du undervisning i oppmerksomhetstrening/mindfulness. Vi ønsker å undersøke om du har hatt nytte av dette i etterkant av kurset.

I løpet av den siste måneden: Hvor mange ganger hver uke har du regelmessig praktisert oppmerksomhetstrening?

- Ingen
- 1-2 ganger i uka
- 3-4 ganger i uka
- 5-6 ganger i uka
- Hver dag

19. Sammenliknet med arbeids- og stønadssituasjonen rett før arbeidsrehabiliteringskurset har jeg.....

- Økt min arbeidsdeltakelse (dvs. økt antall timer jeg jobber pr. uke)
- Fortsatt som før (dvs. ingen endring i arbeidsdeltakelse/sykemeldingsgrad)
- Redusert min arbeidsdeltakelse (dvs. gått ned i antall timer jeg jobber pr. uke)

20. Etter arbeidsrehabiliteringskurset kom jeg, helt eller delvis, tilbake i arbeid.....

- Umiddelbart, eller i løpet av de første to ukene
- Innen 1 måned
- Innen 2 måneder
- Innen 3 måneder
- Mellom 3 og 6 måneder
- Mellom 6 og 12 måneder
- Har ikke kommet tilbake i arbeid

21. Har du for tiden et arbeidsforhold? (ikke ta hensyn til om du er sykemeldt)

- Nei
- Ja

Appendix III: Questionnaires in Papers I-III

Bakgrunnskunnskap studie 2

1. Kjønn: Mann Kvinne

2. Fødselsår: (åååå - f.eks. 1965)

3. Fødeland:

4 a) Sivilstatus: Enslig Gift/samboer Enke/enkemann Skilt/Separert

4 b) Bostatus: Alene Egen familie/samboer Oppvekstfamilie/foreldre Bor sammen med andre

5 a) Hva er hovedgrunnen til at du er innsøkt på Durapart?

6 a) Hvor lenge har du vært sykmeldt? (Dersom sykemeldt først en periode og nå arbeidsavklaring regnes tiden fra du ble sykemeldt)

0-3 mnd

7-9 mnd

mer enn 12 mnd (på arbeidsavklaring)

4-6 mnd

10-12 mnd

mer enn 24 mnd (på arbeidsavklaring)

6 b) Hvis du har vært ute av arbeid i over ett år på grunn av skade/sykdom, hvor lenge er det siden du var i arbeid?

_____ antall år

7. a) Har du fått en diagnose fra lege? Ja Nei

b) Hvis Ja: Hvilken Diagnose har du fått fra lege?:.....

8. Hvordan opplever du husholdningens økonomiske situasjon? Uanstrengt Anstrengt

9. Hvor mange barn har du?

0

1

2

3

4

Flere enn 4

10. Dersom du har barn: Hvor mange av dine barn bor hjemme?

0

1

2

3

4

Flere enn 4

11. Opplever du omsorgsoppgaver i eller utenfor familien som energikrevende og/eller belastende?

Ja, i stor grad

Ja, i liten grad

Nei

Har ikke omsorgsoppgaver

12. Opplever du vansker med lesing og skriving?

Ja

Til en viss grad

Nei

13. Venter du på svar om forsikringsutbetaling?

Ja

Nei

Vet ikke

14. Utdanning (Sett kryss ved den høyeste utdannelsen du har fullført)

Ikke fullført 9/10-årig grunnskole

9/10 årig grunnskole

Videregående skole

Høgskole eller Universitet (lavere grad eller bachelor)

Høyere universitetsgrad (på hovedfags-/Masternivå eller høyere)

Appendix III: Questionnaires in Papers I-III

15 a) Hvordan var din Arbeids – og stønadssituasjon rett før ARR-kurset startet?

Under følger en rekke påstander relatert til din arbeids - og stønadssituasjon rett før du startet på ARR-kurset. Kryss av alle de påstandene som passer for deg. **Flere svaralternativer er mulig.**

- Jeg var i jobb, helt eller delvis
- Jeg var sykemeldt, helt eller delvis
- Jeg deltok i arbeidstrening
- Jeg deltok i rehabilitering
- Jeg mottok arbeidsavklaringspenger
- Jeg gikk på skole / tar utdanning
- Jeg var registrert som arbeidssøker
- Jeg mottok uførestønad
- Jeg har søkt uførepensjon
- Andre tiltak (Spesifiser: _____)
- Andre stønader: (Spesifiser: _____)

15 b) Hvor stor var din sykemeldingsprosent før du begynte på ARR-kurset? _____ %

(Hvis du ikke var sykemeldt, skriv 0%. Dersom du var fullt sykemeldt, skriv 100%. Jobber du vanligvis 50% men var fullt sykemeldt, skriv 100%)

16. Hovedinntektskilde:

- Ordinær lønn
- Sykepenger
- Arbeidsavklaringspenger
- Kvalifiseringsstønad
- Sosialstønad
- Annet: (Spesifiser: _____)

17. Har du for tiden et arbeidsforhold? (ikke ta hensyn til om du er sykemeldt)

- Nei
- Ja

Arbeidsevne (in English: WAS-Work Ability Score)

Hvordan vurderer du din arbeidsevne nå sammenlignet med da den var på sitt beste? Vi går ut fra at arbeidsevne på sitt beste verdsettes med 10 poeng, mens 0 betyr at hun/han ikke er i stand til å arbeide for øyeblikket.

Helt uten evne til å arbeide

0 1 2 3 4 5 6 7 8 9 10

Din beste arbeidsevne

Livskvalitet (in English: QOL-Quality of life)

Her har vi en stige med ti trinn. Hvis vi tenker oss at det høyeste trinnet på denne stigen står for det best mulige liv du kunne tenke deg og det laveste trinnet for det verst mulige liv du kunne tenke deg. Hvilket trinn vil du si passer best for ditt nåværende liv?

- 10 Best mulig
- 9
- 8
- 7
- 6
- Egenvurdert livskvalitet 5
- 4
- 3
- 2
- 1 Verst mulig

Appendix III: Questionnaires in Papers I-III

Mindfulness (in English: FFMQ-Five Facet Mindfulness Questionnaire)

Under finner du en del påstander som omhandler hvordan du opplever dagene som kommer og går. Vi ønsker at du indikerer hvor sann hver påstand er for deg. Vennligst svar hva som virkelig preger din opplevelse, og ikke hva du tenker din opplevelse burde være.

	Aldri eller veldig sjeldent sant	Sjeldent sant	Av og til sant	Ofte sant	Veldig ofte eller alltid sant
1. Når jeg går legger jeg bevisst merke til hvordan det kjennes at kroppen beveger seg	1	2	3	4	5
2. Jeg er flink til å finne ord for å beskrive følelsene mine	1	2	3	4	5
3. Jeg kritiserer meg selv for å ha ufornuftige eller upassende følelser	1	2	3	4	5
4. Jeg legger merke til følelsene mine uten at jeg trenger å reagere på dem	1	2	3	4	5
5. Når jeg holder på med ting, begynner tankene å vandre og jeg blir lett distraheret	1	2	3	4	5
6. Når jeg dusjer eller bader legger jeg merke til hvordan vannet føles mot kroppen	1	2	3	4	5
7. Jeg kan lett sette ord på oppfatninger, meninger og forventninger	1	2	3	4	5
8. Jeg legger ikke merke til det jeg gjør fordi jeg dagdrømmer, bekymrer meg eller er distraheret på andre måter	1	2	3	4	5
9. Jeg observerer følelsene mine uten å bli fanget av dem	1	2	3	4	5
10. Jeg sier til meg selv at jeg ikke burde føle det jeg føler	1	2	3	4	5
11. Jeg legger merke til hvordan mat og drikke påvirker tankene, kroppsforfølelsene og følelsene mine	1	2	3	4	5
12. Det er vanskelig for meg å finne ord for å beskrive hva jeg tenker	1	2	3	4	5
13. Jeg blir lett distraheret	1	2	3	4	5
14. Jeg tror at noen av tankene mine er unormale eller dårlige og at jeg ikke burde tenke slik	1	2	3	4	5
15. Jeg legger merke til sanseopplevelser, som vinden i håret mitt eller solen mot ansiktet	1	2	3	4	5

Appendix III: Questionnaires in Papers I-III

	Aldri eller veldig sjeldent sant	Sjeldent sant	Av og til sant	Ofte sant	Veldig ofte eller alltid sant
16. Jeg har vansker med å komme på de rette ordene for å uttrykke hva jeg føler om ting	1	2	3	4	5
17. Jeg bedømmer om tankene mine er gode eller dårlige	1	2	3	4	5
18. Jeg synes det er vanskelig å holde oppmerksomheten rettet mot det som skjer her og nå	1	2	3	4	5
19. Når jeg får ubehagelige tanker eller forestillingsbilder, "trår jeg tilbake" og er bevisst på tanken eller forestillingsbildet uten å bli revet med	1	2	3	4	5
20. Jeg legger merke til lyder, som klokker som tikker, fugler som synger, eller biler som passerer	1	2	3	4	5
21. I vanskelige situasjoner kan jeg stoppe opp uten å reagere umiddelbart	1	2	3	4	5
22. Når jeg kjenner noe i kroppen er det vanskelig for meg å beskrive det, fordi jeg ikke finner de rette ordene	1	2	3	4	5
23. Det virker som om jeg "kjører på autopilot" uten å være bevisst på hva jeg gjør	1	2	3	4	5
24. Når jeg har plagsomme tanker eller forestillingsbilder, tar det ikke lang tid før jeg kjenner meg rolig igjen	1	2	3	4	5
25. Jeg sier ofte til meg selv at jeg ikke burde tenke slik som jeg gjør	1	2	3	4	5
26. Jeg legger merke til hvilken lukt eller duft ting har	1	2	3	4	5
27. Selv når jeg er veldig opprørt, kan jeg finne måter å sette ord på det på	1	2	3	4	5
28. Jeg haster gjennom aktiviteter uten å være virkelig oppmerksom på dem	1	2	3	4	5
29. Når jeg har forstyrrende tanker eller forestillingsbilder er jeg i stand til å bare legge merke til dem uten å reagere	1	2	3	4	5
30. Jeg synes at noen av følelsene mine er dårlige og upassende, og at jeg ikke burde ha dem	1	2	3	4	5
31. Jeg legger merke til visuelle elementer i kunstverk eller naturen, som farger, former, overflate, eller mønstre av lys og skygge	1	2	3	4	5
32. Det ligger naturlig for meg å sette ord på erfaringene mine	1	2	3	4	5

Appendix III: Questionnaires in Papers I-III

	Aldri eller veldig sjeldent sant	Sjeldent sant	Av og til sant	Ofte sant	Veldig ofte eller alltid sant
33. Når jeg har ubehagelige tanker eller forestillingsbilder, legger jeg bare merke til dem og lar dem passere	1	2	3	4	5
34. Jeg gjør arbeidsoppgaver automatisk uten å være bevisst på hva jeg gjør	1	2	3	4	5
35. Når jeg har ubehagelige tanker eller forestillingsbilder, bedømmer jeg meg selv som god eller dårlig avhengig av hva tanken/forestillingsbildet handler om	1	2	3	4	5
36. Jeg legger merke til hvordan følelsene mine påvirker tankene og handlingene mine	1	2	3	4	5
37. Jeg kan som regel gi en svært detaljert beskrivelse av hvordan jeg har det i øyeblikket	1	2	3	4	5
38. Jeg oppdager at jeg gjør ting uten å være oppmerksom	1	2	3	4	5
39. Jeg blir misfornøyd med meg selv når jeg har ufornuftige idèer	1	2	3	4	5

Subjektive helseplager (in English: SHC-Subjective Health Complaints)

Har du i løpet av den siste måneden vært plaget av:
Sett ett kryss på hver linje

	Ikke plaget	Litt plaget	Endel plaget	Alvorlig plaget varte (omtrent)	Antall dager plagene
1. Nakkesmerter	0	1	2	3	_____
2. Smerter øverst i ryggen	0	1	2	3	_____
3. Smerter i korsrygg	0	1	2	3	_____
4. Smerter i armene	0	1	2	3	_____
5. Smerter i skuldre	0	1	2	3	_____
6. Smerter i føttene	0	1	2	3	_____
7. Hodepine	0	1	2	3	_____
8. Fordøyelsesproblemer	0	1	2	3	_____
9. Brystsmerter	0	1	2	3	_____
10. Svimmelhet	0	1	2	3	_____
11. Nedtrykt, depresjon	0	1	2	3	_____
12. Angst	0	1	2	3	_____
13. Andre plager	0	1	2	3	_____

Appendix III: Questionnaires in Papers I-III

Smerte-intensitet (in English: pain intensity)

Styrke på smerter/plager	Ingen smerter											Verst tenkelige smerter
1. Vennligst merk av for det tallet som best beskriver de sterkeste smertene/plagene du har hatt i løpet av de siste 24 timer	0	1	2	3	4	5	6	7	8	9	10	
2. Vennligst merk av for det tallet som best beskriver de svakeste smertene/plagene du har hatt i løpet av de siste 24 timer	0	1	2	3	4	5	6	7	8	9	10	
3. Vennligst merk av for det tallet som best angir hvor sterke smerter/plager du har i gjennomsnitt	0	1	2	3	4	5	6	7	8	9	10	
4. Vennligst merk av for det tallet som best angir hvor sterke smerter/plager du har akkurat nå	0	1	2	3	4	5	6	7	8	9	10	

Smerte-konsekvenser (in English: pain consequences)

Merk av for det tallet som for de siste 24 timene best beskriver hvor mye smertene/plagene har virket negativt inn på:

	Ikke påvirket											Fullstendig påvirket
1. Daglig aktivitet	0	1	2	3	4	5	6	7	8	9	10	
2. Humør	0	1	2	3	4	5	6	7	8	9	10	
3. Evne til å gå	0	1	2	3	4	5	6	7	8	9	10	
4. Vanlig arbeid (gjelder både arbeid utenfor hjemmet og i hjemmet)	0	1	2	3	4	5	6	7	8	9	10	
5. Forhold til andre mennesker	0	1	2	3	4	5	6	7	8	9	10	
6. Søvn	0	1	2	3	4	5	6	7	8	9	10	
7. Livsglede	0	1	2	3	4	5	6	7	8	9	10	

Appendix III: Questionnaires in Papers I-III

Personlig utbrenthet (in English: personal burnout)

Energinivå	Aldri/ nesten aldri	Sjelden	Av og til	Ofte	Alltid
1. Hvor ofte føler du deg trøtt?	1	2	3	4	5
2. Hvor ofte er du fysisk utmattet?	1	2	3	4	5
3. Hvor ofte er du følelsesmessig utmattet?	1	2	3	4	5
4. Hvor ofte tenker du: "Nå klarer jeg ikke mer"?	1	2	3	4	5
5. Hvor ofte er du utkjørt?	1	2	3	4	5
6. Hvor ofte føler du deg svak og mottagelig for sykdom?	1	2	3	4	5

Kontroll (in English: sense of mastery)

Her følger fem utsagn som dreier seg om erfaringer og opplevelser om kontroll med det som skjer i livet. Vi ber deg ta stilling til i hvilken grad du er enig eller uenig i utsagnene. Markør ved å klikke av på det svaralternativ som passer best for deg

	Svært enig	Enig	Like mye enig som uenig	Uenig	Svært uenig
1. Jeg har liten kontroll over det som hender meg	1	2	3	4	5
2. Noen av mine problemer er det ikke mulig å løse	1	2	3	4	5
3. Det er ikke mye jeg kan gjøre for å forandre på viktige ting i livet mitt	1	2	3	4	5
4. Jeg føler ofte at jeg er hjelpeløs når det gjelder å takle livets problemer	1	2	3	4	5
5. Av og til føler jeg meg som en brikke i livets spill	1	2	3	4	5

Appendix III: Questionnaires in Papers I-III

Selvfølelse (in English: self-esteem)

Her kommer noen påstander som handler om dine tanker om deg selv. Hvordan stemmer disse påstandene for deg?

Helt enig

Sterkt uenig

1. Jeg er stort sett fornøyd med meg selv	1	2	3	4
2. Noen ganger syns jeg at jeg ikke er god nok for noen ting	1	2	3	4
3. Jeg syns at jeg har flere gode kvaliteter	1	2	3	4
4. Jeg er i stand til å gjøre ting like godt som folk flest	1	2	3	4
5. Jeg føler at jeg ikke har mye å være stolt av	1	2	3	4
6. Til tider føler jeg meg ubrukelig	1	2	3	4
7. Jeg føler at jeg er en verdifull person, i det minste på samme nivå som andre	1	2	3	4
8. Jeg skulle ønske at jeg hadde mer respekt for meg selv	1	2	3	4
9. Alt i alt er jeg tilbøyelig til å føle meg mislykket	1	2	3	4
10. Jeg har en positiv innstilling til meg selv	1	2	3	4

Kroppsrespons (in English: body responsiveness)

Disse spørsmålene handler om i hvilken grad du "lytter" til kroppen din	Helt usant om meg	Nokså usant om meg	Litt usant om meg	Verken sant eller usant om meg	Litt sant om meg	Nokså sant om meg	Helt sant om meg
1. Jeg er sikker på at kroppen min gir meg signaler om hva som er bra for meg	1	2	3	4	5	6	7
2. Mine kroppslige behov leder meg til å gjøre ting som jeg senere angrer	1	2	3	4	5	6	7
3. Hode og kropp ønsker ofte å gjøre forskjellige ting	1	2	3	4	5	6	7
4. Jeg undertrykker de signaler kroppen gir meg	1	2	3	4	5	6	7
5. Jeg lytter til kroppens råd om hva jeg skal gjøre	1	2	3	4	5	6	7
6. Det er viktig for meg å kjenne etter hvordan kroppen min har det gjennom dagen	1	2	3	4	5	6	7
7. Jeg liker å bli mer kjent med hvordan kroppen min har det	1	2	3	4	5	6	7

Appendix IV



UNIVERSITETET I OSLO

DET MEDISINSKE FAKULTET

John Lundstøl
Universitetet i Agder
Postboks 509
4898 Grimstad

**Regional komité for medisinsk og helsefaglig
forskningsetikk sør-øst D (REK sør-øst D)**

Postboks 1130 Blindern
NO-0318 Oslo

Telefon: 22 85 05 93

Dato: 22.12.10

Deres ref.:

Vår ref.: 2010/2879

E-post: post@helseforskning.etikkom.no

Nettadresse: <http://helseforskning.etikkom.no>

2010/2879 Personer i aktivitet og arbeid

Vi viser til søknad av 04.11.10 om godkjenning av det ovenfor nevnte forskningsprosjekt. Søknaden ble behandlet i komiteens møte 02.12.10.

Prosjektleder er professor John Lundstøl.

Forskningsansvarlig er Universitetet i Agder ved øverste administrative ledelse.

Prosjekttema:

Prosjektet er en undersøkelse av sykefraværestiltaket "Arbeidsrettet Rehabilitering" (ARR) ved arbeidsmarkedsbedriften Durapart. Formålet med prosjektet er å utforske og systematisere erfaringer fra Arbeidsrettede Rehabiliteringstiltak (ARR) ved arbeidsmarkedsbedriften Durapart. Ved det vil man utvikle kunnskap om virksomme elementer ved arbeidsrehabiliterende tiltak. Fokus i prosjektet er satt på hva som skal til for å få ulike mennesker mer aktive og tilbake i arbeid. I tillegg skal man se på utstøtingsmekanismer i arbeidslivet. Målgruppen til ARR er sykemeldte arbeidstakere med antatt arbeidsevne som har vært til medisinske utredninger og behandling, men som ikke har klart å ta steget tilbake til arbeidslivet. ARR har spesialisert sin kompetanse mot personer med muskel/skjelettplager, lettere psykiske plager og sammensatte plager/problemer. Totalt skal 360 personer inkluderes i prosjektet.

Vedtak:

Etter søknaden fremstår ikke prosjektet som et medisinsk og helsefaglig forskningsprosjekt og faller derfor utenfor komiteens mandat, jf. helseforskningsloven § 2. Prosjektet er ikke fremleggelsespliktig, jf. helseforskningsloven § 10.

Komiteen vurderer det slik at prosjektet faller utenfor komiteens mandat fordi fokus i prosjektet er på om et tiltak for å få sykemeldte tilbake i arbeid har ønsket effekt. Prosjektdeltakerne har en diagnose og det skal innhentes selvrapporterte helseopplysninger fra dem.

I henhold til helseforskningsloven er det imidlertid formålet med prosjektet som er avgjørende for om det faller inn under lovens virkeområde. Prosjektleder beskriver selv at formålet med prosjektet er å "... utforske og systematisere erfaringer fra Arbeidsrettede Rehabiliteringstiltak ved Durapart og derigjennom utvikle kunnskap om virksomme elementer ved arbeidsrehabiliterende tiltak." Etter en helhetlig vurdering av prosjektet har

komiteen falt ned på at prosjektet faller utenfor mandatet for hva som skal vurderes av REK.

Komiteens vedtak kan påklages til Den nasjonale forskningsetiske komité for medisin og helsefag, jf. forvaltningsloven 28 flg. En eventuell klage sendes til REK Sør-Øst D. Klagefristen er tre uker fra mottak av dette brevet.

Med vennlig hilsen

Stein A. Evensen (sign.)
professor dr.med.
leder

Ingrid Middelthon
seniorrådgiver

Kopi:
Universitetet i Agder

Appendix V



Solveig Vindholmen
Institutt for psykososial helse Arendal
Universitetet i Agder
Serviceboks 422
4604 KRISTIANSAND S

Vår dato: 13.07.2011

Vår ref: 26114 / 3 / LT

Deres dato:

Deres ref:

TILRÅDING AV BEHANDLING AV PERSONOPPLYSNINGER

Vi viser til melding om behandling av personopplysninger, mottatt 21.01.2011. All nødvendig informasjon om prosjektet forelå i sin helhet 12.07.2011. Meldingen gjelder prosjektet:

26114

Behandlingsansvarlig

Daglig ansvarlig

Personer i Aktivitet og Arbeid

Universitetet i Agder, ved institusjonens overste leder

Solveig Vindholmen

Personvernombudet har vurdert prosjektet, og finner at behandlingen av personopplysninger vil være regulert av § 7-27 i personopplysningsforskriften. Personvernombudet tilrår at prosjektet gjennomføres.

Personvernombudets tilråding forutsetter at prosjektet gjennomføres i tråd med opplysningene gitt i meldeskjemaet, korrespondanse med ombudet, eventuelle kommentarer samt personopplysningsloven/-helseregisterloven med forskrifter. Behandlingen av personopplysninger kan settes i gang.

Det gjøres oppmerksom på at det skal gis ny melding dersom behandlingen endres i forhold til de opplysninger som ligger til grunn for personvernombudets vurdering. Endringsmeldinger gis via et eget skjema, http://www.nsd.uib.no/personvern/forsk_stud/skjema.html. Det skal også gis melding etter tre år dersom prosjektet fortsatt pågår. Meldinger skal skje skriftlig til ombudet.

Personvernombudet har lagt ut opplysninger om prosjektet i en offentlig database, <http://www.nsd.uib.no/personvern/prosjektoversikt.jsp>.

Personvernombudet vil ved prosjektets avslutning, 31.12.2020, rette en henvendelse angående status for behandlingen av personopplysninger.

Vennlig hilsen


Vigdis Namtvedt Kvalheim


Lis Tenold

Kontaktperson: Lis Tenold tlf: 55 58 33 77

Vedlegg: Prosjektvurdering



FORMÅL

Formålet med prosjektet er å foreta en undersøkelse av sykefraværestiltaket "Arbeidsrettet Rehabilitering" (ARR) ved Durapart.

UTVALGET - REKRUTTERING - FØRSTEGANGSKONTAKT

Utvalget omfatter totalt ca. 400 personer:

- delstudie 1 - personer som har påbegynt/gjennomført rehabiliteringskurs med arbeid som overordnet mål ved Durapart, fra 2007-2011, ca. 200 personer.
- delstudie 2 - sykemeldte arbeidstakere som innsøkes til ARR-kurs ved Durapart i 2011 og 2012. ca. 200 personer.

Rekruttering og førstegangskontakten til utvalgene opprettes gjennom instansen som har tilgang til navn og adresseopplysninger. De formidler informasjonsskriv på vegne av prosjektleder.

Personvernombudet legger til grunn at taushetsplikten ikke er til hinder for førstegangskontakt.

METODE FOR DATAINNSAMLING

Opplysningene samles inn gjennom en spørreskjemaundersøkelse samt tilgang til spørreskjemaet om Livskvalitet som respondenten fyller ut første og siste uke av kurset på Durapart.

Det vil bli sendt ut nytt spørreskjema etter 6 måneder og etter 12 måneder. Personvernombudet ber om at spørreskjema som benyttes her ettersendes når de foreligger.

Respondenten kan velge å fylle ut skjemaet postalt eller via Internett.

Personvernombudet finner at det kan bli samlet inn og registreres sensitive personopplysninger om helseforhold, jf. personopplysningsloven § 2 nr. 8 bokstav c.

Ved gjennomføring av den nettbaserte spørreskjemaundersøkelse benyttes Surveyxact. Personvernombudet forstår det slik at Surveyxact er databehandler i prosjektet og ombudet forutsetter at det inngås en databehandleravtale mellom Universitetet i Agder og Surveyxact, jf. personopplysningsloven § 15.

INFORMASJON OG SAMTYKKE

Det sendes først ut et informasjonsskriv hvor det redegjøres for alle deler av prosjektet og innhentes skriftlig samtykke for deltakelse samt tilbakemelding på om respondenten ønsker å fylle ut skjemaet postalt eller elektronisk.

Personvernombudet finner i utgangspunkt skrivene mottatt 11.07.2011 og 12.07.2011 godt utformet, men forutsetter at følgende endres/tilføyes:

- logoen til Durapat og Aust-Agder fylkeskommune tas vekk
- at det presiseres i informasjonsskrivene at det kun vil være prosjektleder og hennes faglige veileder (oppgi gjerne navn) som vil ha tilgang til innsamlede personopplysninger

Personvernombudet ber om at kopi av endelig informasjonsskriv ettersendes før det tas kontakt med utvalget.

REGISTRERING - OPPBEVARING - PROSJEKTSLUTT

Fra spørreskjemaet vil det bli registrert opplysninger om bl.a.: Kjønn, alder, diagnose, arbeidsevne, sykemeldingslengde, psykologiske parametre som motivasjon, mestring, selvfølelse.

Innsamlede opplysninger registreres på isolert privat pc. Pc-tilgangen er beskyttet med brukernavn og passord.

Personvernombudet legger til grunn at bruk av privat pc er i tråd med Universitetet i Agder sine rutiner for datasikkerhet.

Alle opplysningene vil bli behandlet uten navn og fødselsnummer eller andre direkte gjenkjennende opplysninger. En kode knytter informant til avgitte opplysninger gjennom en navneliste. Denne navnelisten holdes adskilt fra det innsamlete datamateriale.

Innsamlede opplysninger anonymiseres ved prosjektslutt, senest 31.12.2020. Med anonymisering innebærer at navnelister slettes/makuleres, og ev. kategorisere eller slette indirekte personidentifiserbare opplysninger.

IKKE OMFATTET AV PERSONVERNOMBUDETS GODKJENNING

Prosjektleder tar også sikte på å gjennomføre undersøkelser med kontrollgrupper i forhold til delstudie 1 og 2. Opplegget for denne delen er imidlertid ikke ferdig utarbeidet. Prosjektleder vil sende inn tilleggsopplysninger i god tid før oppstart av utsendelse av informasjonsskriv og spørreskjema. Personvernombudet anbefaler at det benyttes vårt utarbeidede endrings skjema, se våre nettsider, <http://www.nsd.uib.no/personvern/>

I opprinnelig melding var det også meningen at det skulle innhentes registeropplysninger fra bla. Fd-trygd og NAV. Dette er likevel ikke aktuelt.

