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
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; Øyeflaten, 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

| 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 resources, 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 (Braatoy, 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 \((9\% \text{ dropped out})\). 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.surveyxact.com/).

**Measures**

**Work ability**

A single item called the Work Ability Score (WAS) (Tuomi, Ilmarinen, Jahkola, Katajariinne, & 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 Delle (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 week 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-
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 \((p < .001, \text{Hedges’ } g = 1.59, 95\% \text{ CI} = 1.10–2.08)\) and a medium Cohen effect size for nonresponders \((p < .001, \text{Hedges’ } g = 0.46, 95\% \text{ CI} = -0.04–0.96)\).

**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 \((\text{Hedges’ } g = 0.52, 95\% \text{ CI} = 0.06–0.99, \text{medium Cohen effect size})\) and
Table 3. Correlations, means, standard deviations, and reliability at baseline for all study measures (N = 74).

| Variable | Total N = 74 | WA-responders N = 42 | WA-nonresponders N = 32 | PBO M (SD) | PI M (SD) | PC M (SD) | SHC M (SD) | SOM M (SD) | S-E M (SD) |
|----------|--------------|-----------------------|-------------------------|------------|-----------|-----------|------------|------------|------------|
| WAS      | 3.8 (2.2)    | −.33<sup>a</sup>      | −.18                    | −.28<sup>b</sup> | −.15      | .08       | −.04       |            |            |
| PBO      | 62.6 (17.5)  | 62.2 (18.9)           | 63.0 (15.9)             | −          | .25<sup>b</sup> | .57<sup>a</sup> | .42<sup>a</sup> | .29<sup>b</sup> | −.21       |
| PI       | 14.5 (8.4)   | 12.6 (7.5)            | 16.9 (8.9)<sup>ª</sup>   | −          | −         | .70<sup>a</sup> | .59<sup>a</sup> | .27<sup>b</sup> | .19        |
| PC       | 29.3 (19.0)  | 26.2 (20.0)           | 33.6 (17.2)             | −          | −         | −         | .63<sup>a</sup> | .39<sup>a</sup> | −.07       |
| SHC      | 13.6 (6.9)   | 12.8 (6.4)            | 14.6 (7.4)              | −          | −         | −         | −.35<sup>a</sup> | −.02       |            |
| SOM      | 14.3 (3.5)   | 15.1 (3.3)<sup>ª</sup>| 13.2 (3.6)              | −          | −         | −         | −          | .43<sup>b</sup> |            |
| 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.

<sup>a</sup>Correlation significant at p < .01 (two-tailed).
<sup>b</sup>Correlation significant at p < .05 (two-tailed).
<sup>ª</sup>p < .05 for independent t-tests that compared WA-responders and WA-nonresponders at baseline.
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
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-Presseau 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  | β     | t    | p   | 95% CI             |
|----------|-------|-----|-------|------|-----|--------------------|
| Constant | -0.80 | 2.73| -0.29 | .77  |     | [-6.26, 4.66]      |
| Age      | -0.00 | 0.03| -0.01 | -0.06| .95 | [-0.07, 0.07]      |
| Gender (0 = female, 1 = male) | 0.52 | 0.88| 0.08 | 0.59 | .56 | [-1.23, 2.27]      |
| Education level (0 = high, 1 = low) | 0.25 | 0.70| 0.05 | 0.36 | .72 | [-1.14, 1.64]      |
| Sick-leave duration | 0.15 | 0.23| 0.09 | 0.66 | .51 | [-0.31, 0.62]      |
| Pain intensity before treatment | -0.07 | 0.04| -0.21 | -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.