Vocational rehabilitation of patients with prolonged fatigue
Joosen, M.C.W.

Citation for published version (APA):
Joosen, M. C. W. (2011). Vocational rehabilitation of patients with prolonged fatigue

General rights
It is not permitted to download or to forward/distribute the text or part of it without the consent of the author(s) and/or copyright holder(s), other than for strictly personal, individual use, unless the work is under an open content license (like Creative Commons).

Disclaimer/Complaints regulations
If you believe that digital publication of certain material infringes any of your rights or (privacy) interests, please let the Library know, stating your reasons. In case of a legitimate complaint, the Library will make the material inaccessible and/or remove it from the website. Please Ask the Library: http://uba.uva.nl/en/contact, or a letter to: Library of the University of Amsterdam, Secretariat, Singel 425, 1012 WP Amsterdam, The Netherlands. You will be contacted as soon as possible.
Chapter 8

General Discussion
The main objective of this thesis was to generate knowledge about the role of different existing vocational rehabilitation (VR) treatments with respect to daily life functioning and work participation of patients with prolonged fatigue complaints. In this chapter, the main research findings of this thesis are presented, and strengths and weaknesses of the research are discussed. Furthermore, recommendations for future research and practice are presented.

Main findings

1) Which VR treatments are practiced in the Netherlands and what is their content?

Among the 10 VR institutions that were identifiable as treating impaired workers with prolonged fatigue in the Netherlands, 13 different types of VR treatments were used in 2010. The main purpose of VR treatments was to facilitate return-to-work (RTW) and improve daily life functioning. In the case of most treatments, the content was multi-component focussed (n=8), combining physical, psychological, and work-directed interventions. In the case of three treatments, content was focussed on only two components; in the case of two treatments only psychological intervention was provided. Eight treatments took between 3 and 6 months in total and combined individual with group sessions. Treatments were mainly considered to be successful when the patient could cope with his or her own limitations and capacities, when the employer was satisfied with the outcome and cooperation with VR treatment, when patients returned to their original work, and when balance was reached between daily life and work. Thus, the majority of the specialised VR treatments in the Netherlands offer multi-component interventions to fatigued workers with the aim of improving both daily life functioning and work participation.

That multi-component treatments are actually carried out is confirmed by the outcomes of a process evaluation of three existing VR treatments (Chapter 5). This process evaluation demonstrates that the three VR treatments were administered according to their pre-defined treatment protocol, which consisted of multi-component treatments using a biopsychosocial approach in each case.
2) Can VR treatments improve daily functioning and work participation of patients with prolonged fatigue on the short- and the long-term?

Three multi-component VR treatments were evaluated based on their outcomes on patients with prolonged fatigue and work participation problems. These VR treatments were designed and carried out by outpatient institutions in the Netherlands. Using a practice-based research design (Chapters 5 and 7), short and long-term outcomes were studied. The three existing, multi-component VR treatments were successful with improving individual and social functioning, work ability, and work participation. These outcomes were significantly improved directly after treatment compared to measurements before treatment, and improvement was maintained after a long-term measurement, which was taken at 18 months after completing treatment. Moreover, mental health, social functioning, work ability, and work participation continued to improve significantly after treatment was stopped. Lastly, VR treatments also affected fatigue complaints. After 18 months, 37% of patients were no longer cases suffering from severe fatigue compared with 87% at baseline; however, on average the degree of fatigue complaints was still higher among participants compared to the general Dutch working population.

In conclusion, multi-component treatments using a biopsychosocial approach appear to improve the daily life functioning and work participation in patients with prolonged fatigue for as many as 18 months after treatment was completed.

3) What are fatigued patients’ perspectives regarding work experiences before and after receiving VR treatment?

From the qualitative survey in Chapter 6, we learn that workers with prolonged fatigue complaints report work-related problems in several domains. According to workers, aggravating working conditions, difficulties with activities during work, and interpersonal relations all have roles in limiting work abilities. Additionally, fatigued workers described that a lack of self-reflection on individual capabilities and limitations affect their work ability. Due to these latter problems, workers explained that they were not receptive to advice from supervisors or co-workers, thus further hindering the RTW process.

Fatigued workers explained that work participation improved after VR treatment once they learned coping strategies and reflected on personal characteristics, lifestyle and work style. Also, according to workers, a phased-RTW strategy and work
adaptations (like working fewer hours) had a positive effect on their work ability. Findings from the qualitative survey in Chapter 6 were supported by evaluations in Chapters 4 and 5. In those evaluations, more than half of fatigued workers stated that the treatment was effective in reducing work functioning limitations and that their personal aims (including work-related goals) were met. These findings emphasise the importance of addressing personal characteristics in treatments and in the RTW process in addition to modifying the worksite.

Interpretations of findings

Content, aims and outcomes of multi-component VR treatment

In Chapter 1, a conceptual model describes the process and aims of VR in patients with prolonged fatigue (Figure 1). This model presents biological, psychological, and social/occupational factors as factors that can be involved in the perpetuation of fatigue complaints and related disability. We hypothesised that work participation could be improved if VR treatments focus on those factors that obstruct recovery, using a combination of biological, psychological, and social-occupational components. First, Chapter 2 shows that the majority of specialised VR treatments in the Netherlands do indeed use multi-component treatments. In addition, Chapter 5 provides new information about the treatment process and the specific content of existing VR treatments. By evaluating three existing, multi-component VR treatments closely, we found that these approaches do indeed address factors that obstruct patient recovery from fatigue symptoms and the restoration of daily life functioning and work participation. The VR treatments integrated therapeutic approaches with a combination of biological/physical, psychological/cognitive behavioural, and social/work-directed components. Perpetuating factors like the dysregulation of physiological stress systems and physical deconditioning were influenced by physiological adaptation in physical training sessions, body awareness in graded exercise training, and in relaxation and breathing exercises. Next, cognitive behavioural sessions and psychological therapy sessions were employed to influence dysfunctional beliefs and behaviour, and causal attribution. These sessions offered patients insight into their attitudes and beliefs involving work and private life; they
also improved patient knowledge and coping skills. During RTW sessions, psychosocial factors were addressed by teaching workers mechanisms to change attitudes towards work, increase awareness of behavioural patterns at work and in private life, improve job conditions, and involve the employer with making a phased-RTW plan. Upon evaluating these three treatments, differences were identified with regards to 1) the method used to communicate with the patient (group or individual sessions) and 2) the specific intervention techniques used (physical training vs. graded activity, coaching vs. cognitive therapy, addressing work-related problems vs. involving the employer). Deciding how to communicate and which specific intervention technique to use was based on VR institution’s preference or was tailored to patient’s needs.

The conceptual model in Chapter 1 (Figure 1) also suggests that multi-component VR treatment, using a biopsychosocial approach, would be an effective strategy to increase daily functioning and work participation and decrease fatigue complaints. This approach is unique in the field of fatigue research, as it concerns evaluating treatments in the RTW context. In addition, the treatments focus on functional recovery rather than symptomatic recovery. Though reduction in fatigue symptoms can be seen as an additionally outcome. The results presented in Chapters 5 and 7 indicate that using a combination of therapeutic approaches and addressing biological, psychological, and social factors can together increase daily functioning and work participation, lead to more effective behaviour (e.g., adopt a new life/work style) and reduces fatigue complaints. Consequently, these outcomes are likely to maintain or improve further over the long-term.

Few, if any, studies have evaluated the long-term effects of biopsychosocial multi-component treatment on work participation in fatigued patients. One evaluation of a comparable, multi-component treatment approach in patients with non-specific upper extremity complaints showed improvements in daily functioning and work participation after one year as well.¹ A study of a body awareness programme in patients with chronic, non-specific psychosomatic symptoms showed positive, long-term one year results on body awareness, self-efficacy and quality of life one year after the intervention.² Although it was uni-modal, this programme was comparable to some of the psychological components of VR treatment in our research. These results support our findings regarding behaviour change through body awareness, thus suggesting a comparable process of behaviour change.
In conclusion, the study results confirm our hypothesis that a combination of therapeutic approaches, integrated through different treatment components (aimed at both the individual and his (work)environment), have a positive effect on daily functioning and work participation. These findings contribute to our growing understanding of the working mechanisms and outcomes of VR treatment in impaired workers with prolonged fatigue.

Clinically relevant long-term outcomes
When interpreting results from an evaluation study, knowledge of statistical significance is useful in some respects but does not provide information about the clinical relevance of the outcomes, particularly with regard to fatigue and daily functioning outcomes. Two studies in this thesis (Chapters 4 and 7) present effect sizes to assess the clinical relevance by using Cohen’s effect size $d$ for repeated measurements.$^3$ In all statistically significant results from the long-term evaluation (Chapter 7), we found effect sizes of $d>1.2$, indicating large, clinically relevant effects. Furthermore, results from the evaluation studies conducted for this thesis were compared with norm figures from large samples of the Dutch (working) population. In doing this comparison, we found that our population had on average a high rate of severe fatigue complaints at baseline. A total of 87% of patients were suffering from chronic severe fatigue, indicated by the Checklist Individual Strength (CIS) cut-off point above 76.$^4$ This percentage decreased to 45% at the completion of treatment and to 37% at 18 months after treatment. Despite these clinically relevant results, on average patients still reported more fatigue complaints after 18 months compared with the Dutch working population.$^4$ These results were confirmed with both the CIS scores and the vitality scores (SF-36). Secondary outcomes (physical functioning, mental health, social functioning) showed long-term improvement. Moreover, physical functioning scores at 18 months follow-up had increased and were better than scores measured in the general Dutch population.$^5$ Mental health and social functioning increased as well and continued improving after treatment, although they remained lower than the Dutch norm 18 months after treatment. With regards to work participation, return-to-original-work significantly increased from 22% before treatment to 84% at 18 months follow-up. In addition, patients found themselves better able to work immediately after treatment and also 18 months after treatment. Considering that some patients (15/60) modified their employment contract (i.e.,
fewer contracted hours) during the study period, RTW increased to 98% at 18 months follow-up. An important aim and therapeutic approach of VR treatment was to increase awareness of cognitions with respect to work and change dysfunctional beliefs and behaviour. Patients explained that their ability to work increased after both learning to recognise their behavioural patterns at work and in their private lives and after training to cope with their limitations and capacities (e.g., setting boundaries). As a result of gaining this insight, patients may have changed their employment contract to avoid exceeding their capacities, thus resulting in a higher RTW percentage. However, it should be noted that 8 (out of 60) patients no longer had a paying job at the 18-month follow-up and therefore were not included in the RTW analyses. It is unclear whether these patients lost their employment contract by choice (e.g., returned to school, sabbatical, retirement) or because of permanent work disability. Therefore, we cannot draw a concrete conclusion from this finding.

Interestingly, the fact that half of the patients participated in additional treatment during the last year of our study (Chapter 7) indicates that patients were not free of complaints. Perhaps patients were searching for care that would address their remaining symptoms. This theory is supported by the fact that the majority of these patients sought help in complementary and alternative therapies, which often focus on symptomatic relief. However, it remains unclear to what extent these additional treatments either negatively or positively contributed to the outcomes observed in our study (Chapters 5 and 7).

Thus, although fatigue complaints remained prevalent, patients reported being more able to work and outcomes on individual and social functioning, and work participation improved overall in a clinically relevant way, both immediately after VR treatment and on a long-term basis. In fact, outcomes continued to improve long after VR treatment stopped. This finding suggests that patients were more capable of coping repeatedly, day-to-day and week-by-week, with their perceived complaints in both their private and working lives.

**Changes in physiological stress-systems**

One factor possibly associated with the persistence of fatigue complaints and related disability is the dysregulation of physiological stress-systems, particularly cardiac autonomic imbalance. Before using physiological parameters as outcome measures in our long-term evaluation study, we wanted to investigate whether or not cardiac
autonomic balance would change after physical training in patients with prolonged fatigue complaints. Heart rate variability (HRV) was used as a marker to reflect cardiac autonomic activity. In the first study (chapter 3), we used both time-domain and frequency-domain characters to measure HRV. In later studies we focused on high frequency (HF) power values, as it estimates changes in cardiac vagal tone. Higher vagal control is related to reduced heart rate and is involved in the process of recovery and restoration. In the pilot study described in Chapter 3, a six-week training programme was evaluated to explore if HRV would increase after VR treatment. After patients (n=18) with severe fatigue complaints completed the training programme, HRV significantly increased and fatigue complaints significantly decreased. In further short- and long-term evaluation studies (Chapters 5 and 7), we found that HRV positively changed compared to baseline measures after VR treatment that aimed at physiological adaptation by physical training. However, interpreting HRV (and other physiological parameters) remains problematic because of a lack of reliable norm figures. In addition, studies on the differences in physiological mechanisms in specific patient groups show conflicting results. Moreover, previous research showed no differences in peripheral physiological measurements between extremely different groups (burnout patients and engaged workers). Therefore, physiological measurements like HRV may currently not be very useful in the detection of physiological deviations at a group level or to predict future health status. However, HRV is a suitable tool for tracking modifications in clinical state at an individual level. In addition, there are indications that there are gender differences in autonomic cardiovascular regulation after training. Within this context, we can calculated effect sizes to comment on the relevance of the modifications. We did so post-hoc and found “medium” effects (Cohen’s d just below .50) in short and long-term outcomes in the total group. When calculating effect sizes separate for men and women, we found that women had the largest, clinical relevant, change in HRV direct after training (Cohen’s d .51). Hereby, HRV offers insight into the mechanisms of physical training by confirming a positive physiological adaptation after physical training in patients with severe fatigue complaint. In general, these findings correlate with those of previous studies on other populations, like coronary and cancer patients. Additionally, HRV may also be a useful tool for monitoring training responses and subsequently to ensure optimal training (e.g., preventing unfavourable training responses due to over- or under-load) at the individual level, as exemplified
by two VR treatments discussed in this thesis. Thus, HRV or other parameters measuring cardiac autonomic activity may be less suitable for diagnosing purposes or judging patient participation or functioning levels in clinical practice, but they can be useful for evaluation purposes.

**RTW experiences**

Findings of the qualitative survey presented in Chapter 6 emphasise the importance of viewing recovery and the RTW process from a biopsychosocial perspective. Our analysis of work-related problems experienced by patients with extreme fatigue complaints and of the VR treatment strategies the patients believed worked well draws attention to the importance of considering each impaired worker in his or her specific situation, including personal (cognitive) characteristics, when applying VR strategies.

Special attention should be given to the (meta)cognitive abilities of impaired workers with severe fatigue complaints. In our study, workers mentioned that before the VR treatment, they felt stubborn and unreceptive to advice or feedback from co-workers, employers or family members. They were not aware of their behaviour and could not interpret or handle advice from others. This problem calls for certain actions to facilitate the recovery process. Workers placed additional value on receiving intensive, multi-component VR treatment that included work-directed interventions and worker-directed interventions. Specifically, learning to recognise their own behavioural patterns in daily life and at work, and learning strategies to deal with their limitations and capacities were mentioned by workers as important components of their therapy that positively affected work participation. Apparently the outpatient setting in which the VR treatments were conducted was important as well. Workers reported that they had suffered from fatigue for many years, relying on willpower and a daily routine before they finally “collapsed” and called in sick to work. In these cases, by removing the worker from the work site, perpetuating personal factors can be examined and addressed thoroughly without distractions from the work environment. However, aside from focussing on the worker and taking individual processing and recovery time into account\(^{20,21}\), involving the workplace and provide an active role for the employer during an early stage of the rehabilitation process is of great importance, because we know this approach can facilitate the RTW process.\(^{22,23}\)
Methodological considerations

In this section, the methodological issues of this thesis are discussed, as well as the strengths and weaknesses of the study design, study population selection and the outcome measurements used.

Study design
The outcomes of VR treatment were investigated using a pre-/post-test design with repeated measurements as far as 1.5 years after completion of treatment. Although a randomised controlled trial (RCT) design is considered to be the best method to evaluate an intervention, it is not always feasible to perform such a trial. In this case, we were unable to create a controlled design because of the outpatient setting in which the study was performed, as well as financial and ethical constraints. To withdraw care from patients on sick leave, thereby costing society and the employer an enormous amount of money, was not considered to be moral. Besides, the supposed superiority of an RCT in public health research has been discussed by several others.\(^{24,26}\) Often, RCTs lack external validity because they do not produce findings applicable to a real-life context and to the population currently being seen in daily practices (often atypical patients).\(^{27}\) Furthermore, crossover effects between experimental and control groups occur when blinding is not possible, which is particularly likely with public health interventions where long causal pathways are common.\(^{28,29}\) Moreover, when people are monitored, they will react accordingly.\(^{30}\) Thus, even participants in a control group or on a waiting list may alter their behaviours and influence the results. Initially, a study design using two comparison groups within each VR institution was considered. However, the treatments were patient-centred, and care providers found it complicated to allocate patients randomly to structured, standardised treatments. Additionally, it became not possible to create two interventions that were different enough to be real comparisons. The evaluations conducted for this thesis focused therefore only on intervention groups and did so with the best possible study design. This design was strengthened by certain aspects of the process evaluation we performed. From this evaluation, we know that VR treatments were conducted as described in the pre-defined protocol and that they entailed a multi-component, biopsychosocial approach. We also conducted a qualitative survey to strengthen the study design. By doing so, a more in-depth, comprehensive understanding of the
effects of VR treatment was provided. This method also validated the importance of listening to patients as they play a central and active role in the VR process. Findings from the qualitative survey confirmed data from our quantitative studies.

As is often the case with intervention studies using a longitudinal design, we faced the problem of missing data. Missing data occurs when one or more measurement sequences for participants are incomplete, which therefore complicates statistical inference. Removing all cases of missing data would have negatively affected the power of our study. Therefore, we used linear mixed-model analyses to best fit the longitudinal data in the presence of missing data (4.4% of the total data was missing). With this model, we could also select the best fitting variance-covariance model for the present data and investigate trends over time. When overall effects were significant, we performed post-hoc analyses to detect differences between measurements. However, post-hoc analyses should be interpreted with care because multiple testing can lead to high false positive rates and multiple comparisons procedures are recommended. Therefore, we performed bonferroni adjustments and presented the actual p-values with our results for transparency purposes (Chapter 7).

Overall, in evaluating existing VR treatments we used a sound design that was also applicable in practice, conforming to the principles of practice-based research and the TREND statement. This is seen as a strength of this thesis.

Selection of the study population
We used limited selection criteria to include a sample that represent patients in outpatient VR institutions in practice. The VR institutions had their own inclusion criteria, like being motivated to take part in treatment, good command of the spoken and written Dutch language and no diagnosis of a psychiatric disorder. Such a patient group might represent a heterogeneous group that, in the case of an RCT, may threaten validity. However, from the perspective of a practice-based research, selection of participants for this study resembles daily practice and therefore ensures ecological validity.

One of the few inclusion criteria included in this study was that patients suffer from self-reported fatigue complaints. In the pilotstudy presented in Chapter 3 we used exclusion criteria regarding somatic diseases. However, given the impact fatigue complaints (regardless the diagnosis, e.g., burnout, CFS, fibromyalgia, cancer) have on individual, social, and occupational functioning we chose not restrict inclusion to
diagnostic criteria in the other studies. This choice however, may have caused some resistance in accepting our results in the clinical scientific field of mental health and fatigue care. A point of consideration is whether or not we missed eligible patients due to an unclear definition of prolonged fatigue. Practitioners of the VR institutions screened every new client for inclusion in the study. During the inclusion phase, the researchers noticed that some practitioners had doubts about specific cases that they had already excluded from the study. Given the number of practitioners involved in the inclusion process (approximately 30 practitioners from a total of 6 centres), under-representation of the target population might have resulted. However, selection bias is not likely a problem because this doubt was detected at an early stage of the inclusion period, and the definition of prolonged fatigue was then established more clearly and explained to the participating practitioners in all centres.

One problem in the long-term study (Chapter 7) was the high proportion of drop-outs compared to the short-term study (Chapter 5); this problem may have resulted in attrition bias. Patients who benefited from treatment on a short-term basis (first phase of the study) may have been more likely positively respond to the second (long-term) phase of the study. However, a non-response analysis showed no statistical differences between the baseline characteristics and short-term effects of both groups. Moreover, the reasons for dropping out were diverse and included patients with both positive and negative treatment experiences. So, we believe that the ‘long-term’ group was not a select patient group and resembles the original sample in the study. Additionally, this patient group still represents patients with long-lasting fatigue in VR treatments.

Outcomes

The outcomes parameters that were used to evaluate existing VR treatments were chosen in accordance with the goals of VR treatments. Work participation or RTW is the main aim of VR treatments and was defined as the percentage return-to-original-work (mean percentage of the absolute number of working hours, compared to contractual working hours before treatment) and return-to-work (mean percentage of the absolute number of working hours compared to current contractual working hours) (Chapter 4, 5 and 7). At different time points, patients were asked about their current contractual working hours and absolute number of working hours. Because we did not have access to sick leave registration systems, this method was deemed to be the most reliable. Self-reported sick leave data are sometimes questioned with
respect to reliability because people may find it difficult to remember frequency and duration of sick leave, especially when it relates to a long period of time. Because patients in our study were only reporting the current situation, reliability was ensured. A second advantage of this method is measuring “return-to-work” allowed for the identification of modifications in employment contract. In Chapter 7, we report that in 15 patients, contract hours were changed. By using this measure, we collected the most accurate data possible. Next to measuring RTW objectively, we studied perceived work ability using one item of the Work ability Index (WAI). A second item from the WAI was used to study personal prognosis of work ability in the next two years. This provided us insight into the patient’s ability to work and if they felt their work ability would improve over the years.

Decreasing fatigue symptoms was not a direct aim of VR treatment but was a condition central to this thesis. Fatigue is also a known predictor for sick leave and disability. For these reasons, we chose degree-of-fatigue as a primary outcome along with work participation. Along with these primary outcomes, we included the following secondary outcomes to gain knowledge about the therapeutic process: physical functioning (including physical role limitations), mental health (including emotional role limitations), social functioning and HRV.

Although VR treatments also use therapeutic approaches that address insight into attitudes and beliefs, improve coping strategies, and change dysfunctional behaviour, we did not measure these process outcomes in the evaluation studies. Besides, variables such as attitudes, coping strategies and perceptions are not easily measured and lack standardised questionnaires related to RTW and applicable for patient with prolonged fatigue. Yet, in the qualitative interviews, patients reported that gaining awareness of their own behaviour and learning to cope with their limitations and capacities positively influenced work participation (Chapter 6).

Thus, along with standardised and validated questionnaires, we used self-formulated questions, process evaluation and qualitative interviews to collect data. The results of this research project are confirmed by these different perspectives and methods. The strategy using mixed-methods is considered to be a strength of this project.
Recommendations for research

In the Netherlands, employers are co-responsible for VR of disabled workers and become important partners in the RTW process. It is therefore important to explore employers’ perspectives along with the experiences of patients. This research should combine expectations of employers regarding VR treatment for disabled workers, with matched employers’ experiences with these treatments. Also, such research may focus on workplace disability management to investigate what employers themselves do to prevent work disability and facilitate RTW in disabled workers. We actually performed a small study concerning the VR efforts made by employers in fatigued workers with functional impairments (not published). The importance of good collaboration between employer, worker and health care professionals, such as occupational physicians and VR care providers, in the RTW process was stressed. Thus, research from an employer’s perspective may provide knowledge that can be used to stimulate and facilitate cooperative VR strategies.

Multi-component VR treatment seems to positively affect daily life functioning and work participation in patients with prolonged fatigue complaints as their main symptom affecting work ability. This biopsychosocial treatment approach, tailored to patients’ needs, may also be successful in populations with other complex conditions, such as patients with other common mental health disorders, chronic medical conditions or chronic pain patients. Considering that these types of patients, like fatigue patients, are already seen by outpatient VR institutions, such research is warranted.

A final recommendation for future research is to investigate the costs and benefits of existing VR treatments. Especially in the Netherlands, where employers make financial investments to provide workers with VR care at outpatient clinics, such research would be important for the sake of exploring the costs of medical health care and VR care and costs incurred with sickness absence.
Recommendations for practice

Workers and employers
When a worker experiences work participation problems, Dutch legislation requires that both worker and employers are responsible for the RTW process. Because of the complexity of prolonged fatigue complaints, specialised care is often needed. It is therefore recommended that employers find professional help from an occupational physician or outpatient VR service at an early stage to prevent long-term work disability. Along with specific treatment strategies, good cooperation and communication are essential to the RTW process. Patients should try to specify constraints they face in daily life and work, including the consequences of work participation. Conversely, employers should be aware of the implications that fatigue complaints can have for workers as they pertain to emotional and cognitive problems, daily functioning, and work ability and should feel partially responsible for the recovery process of the worker.

The occupational health setting
In our study, patients were suffering from fatigue complaints and functional impairments for over 2.5 years on average before they participated in VR treatment. This is an undesirable situation because of ethical issues (loss of health care) and possible financial consequences due to productivity loss and sick leave costs. Among these patients, long-term positive effects were reported on daily functioning and work participation after multi-component VR treatment. Before treatment, impaired workers felt emotionally distressed and not receptive to advice. Therefore, multi-component VR treatments should be used for disabled patients with prolonged fatigue complaints; preferably early in the course of the condition to prevent long-term sick leave. The occupational physician plays an important role in preventing and managing sickness (absence). Therefore, occupational physicians should consider referral to multi-component VR treatment in impaired workers with prolonged fatigue complaints as a first aid strategy rather than a patient’s last option.

In the Netherlands, outpatient VR care is not centrally controlled, resulting in a wide range of available treatments that are not always clearly visible. The results of Chapter 2 contribute to better visibility and transparency of VR treatment providers
specialised in serving fatigued workers in the Netherlands. Occupational physicians are recommended to use this inventory to gather information about the aims and content of treatments, which can help them make better treatment decisions (referral advice) that best match the preferences of patient and employer.

**VR institutions**

As abovementioned, making the available care transparent in terms of treatment aims and content is important for treatment decision making but also for the development of knowledge in the vocational rehabilitation field. Although competitive motives may obstruct giving complete insight, VR institutions should try to make their treatments (theory and content) more transparent. In this way, professionals can learn from each other which can improve quality of care and professionalization of the vocational rehabilitation field.

We found that various factors hampered patients’ participation at work, including cognitive abilities and social factors. Exploring these factors when patients present with prolonged fatigue complaints would give more insight into the factors that hinder recovery and give direction for individually tailored treatment. Moreover, to be effective at the work participation level, these treatments should combine worker-directed interventions with work-directed interventions. Patient’s personal challenges should be addressed within their social and occupational context, and the employer and the work place should be involved. In addition, work disability demonstrates the existing gap between personal capacity and employers’ and societal demands. Thus, commitment and cooperation among the worker, employer, treatment providers and occupational physicians will result in a more successful approach to prevent long-term work disability. We therefore recommend that all parties invest in a fruitful cooperation and combine forces to address this problem.

**References**


