Evidence-based vocational rehabilitation

Supporting vocational rehabilitation professionals with a decision aid

Christa de Geus

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Colofon

The studies presented in this thesis were conducted at: Amsterdam UMC, Vrije Universiteit Amsterdam, Department of Public and Occupational Health, Amsterdam Public Health research institute, The Netherlands. The Department of Public and Occupational Health participates in the Dutch Research Center for Insurance Medicine (KCVG), which is a joint initiative of the Amsterdam UMC, location Amsterdam Medical Center (AMC) and location VUmc, the University Medical Center Groningen (UMCG) and the Dutch Social Security Institute: the Institute for Employee Benefits schemes (UWV). This thesis was written in collaboration with the Dutch association of labour experts (Arbeidsdeskundig Kennis Centrum, AKC). The studies presented in this thesis were funded by UWV. Financial support for the printing of this thesis was kindly provided by the Amsterdam Public Health Research Institute.

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EVIDENCE-BASED VOCATIONAL REHABILITATION

Supporting vocational rehabilitation professionals with a decision aid

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in het openbaar te verdedigen
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door

Christa Janna Cornelia de Geus

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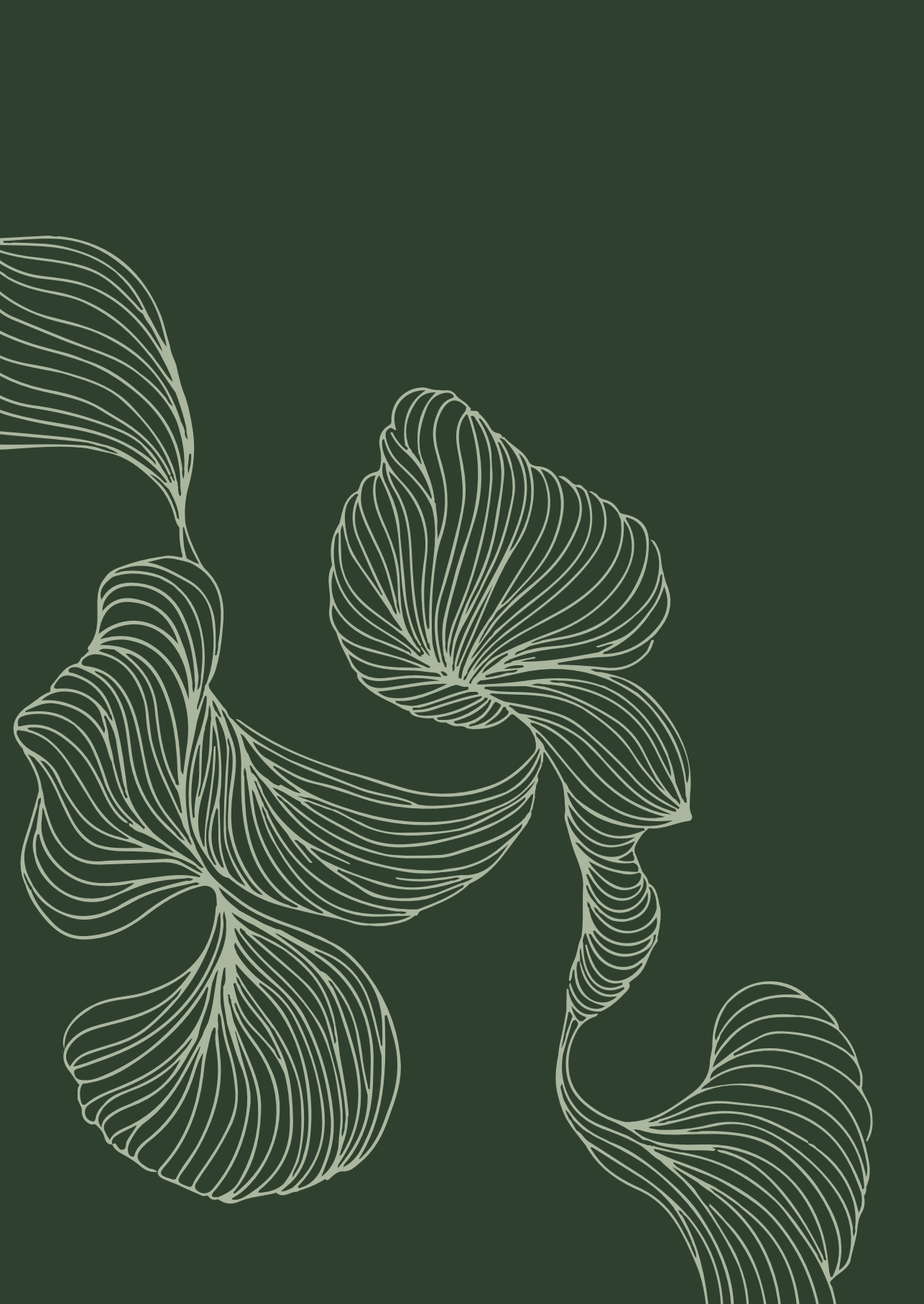
Table of Contents



CHAPTER 1

General introduction

The number of people with a long-term work disability is growing (1). Having a long-term work disability has a significant impact on an individual's life. It leads to lower mental health, reduced general well-being, and a lower quality of life (2, 3). The rising number of people with a long-term work disability also places a substantial financial burden on society, as these individuals are unable to work and often receive a work disability benefit (4). Assisting these people to return to work is thus beneficial for both the individual and society as a whole.

Context of this thesis

In Western countries, people who are unable to work due to sickness or a disability can often receive wage replacements benefits. In addition, people who receive a disability benefit, but with remaining work capacity, often also receive support with returning to work (5). Social security institutes (SSI) often offer various types of support, such as vocational rehabilitation (VR) interventions and job search assistance.

Despite the support these people receive, returning to work or finding new employment can be very difficult. People often suffer from a combination of barriers that prohibit them from returning to work, such as problems with physical health, mental health, finances, family and a mismatch between their educational level and the job they would like (6). A study showed that only 20% of the people who receive a work disability pension for more than 6 months return to work (4). This has major personal consequences for those who do not return to work, since returning to work can be beneficial for well-being (7), quality of life (8) and (mental) health (9, 10).

Work disability pension in the Netherlands

In the Netherlands, if an employee calls in sick, the employer is responsible for continuing the employee's wages and providing VR assistance to help the employee return to work for a period of two years. After this period of time, the employee can apply for a disability pension called the WIA benefit (Wet Werk en Inkomen naar Arbeidsvermogen; Work and Income according to Labour Capacity Act). In the Netherlands, 834,000 persons received a type of work disability benefit in 2023, of which 253,000 people received a long-term (partial) temporary work disability pension (1). The process in which an individual applies for a WIA benefit and the support provided by the SSI for their return to work when a benefit is granted is illustrated in Figure 1.

Work disability assessment

To determine whether a WIA benefit can be granted, an insurance physician of the Dutch SSI will first conduct a medical assessment to determine the functional abilities. Next, a labour expert determines the loss of income (former wages) in a vocational assessment. If the loss of income exceeds 35% of the previous income, a WIA benefit is granted. The WIA benefit comprises of two types of benefits. People who are fully and permanently disabled and are therefore unable to work are granted a WIA IVA (in Dutch: Inkomensvoorziening Volledig Arbeidsongeschikten, full-invalidity) benefit. People who are partially disabled and are able to work are granted a WIA WGA benefit (in Dutch: Werkhervattingsregeling Gedeeltelijk Arbeidsgeschikten; partial or temporary disability benefit) if their loss of income exceeds 35% but is lower than 80%, or if their loss of income exceeds 80% but (partial) recovery is expected. People are eligible for the WIA WGA benefit until they notify the SSI that they have less than 35% loss of earning capacity or if their functional abilities are improved.

Vocational rehabilitation

If persons are granted a WIA WGA benefit, they receive vocational rehabilitation (VR) services offered by the SSI to support their return to work. Persons who are not eligible for a WIA benefit because their loss of income does not exceed 35% of their income can, in some cases, still receive help from the Dutch SSI with their VR. In an assessment, a VR professional determines which (non-medical) barriers prevent the individual from returning to work. Based on these barriers, the professional determines which VR trajectory is most suitable for the person receiving the WIA WGA benefit (the client) and which VR interventions this VR trajectory should contain. The VR professional can choose one of two VR trajectories. If the client is not yet ready to return to work due to extensive barriers, the VR trajectory is aimed at getting '*Fit-for-work*'. VR interventions that are part of this trajectory are for example aimed at identifying the labour market position by doing a career choice test or competency test. After completing the Fit-for-work trajectory or if the client is able and ready to (partly) return to work, the client receives a VR trajectory aimed at helping the client return to paid work, called the Ready-to-work trajectory. VR interventions within this trajectory are aimed at finding work, such as searching together with the client for a suitable job or improving the job application skills of the client. The VR professional can also determine that other VR interventions that are not part of a VR trajectory are needed, such as attending an educational program or course. The VR interventions are often carried out by a third private parties, i.e. reintegration companies.

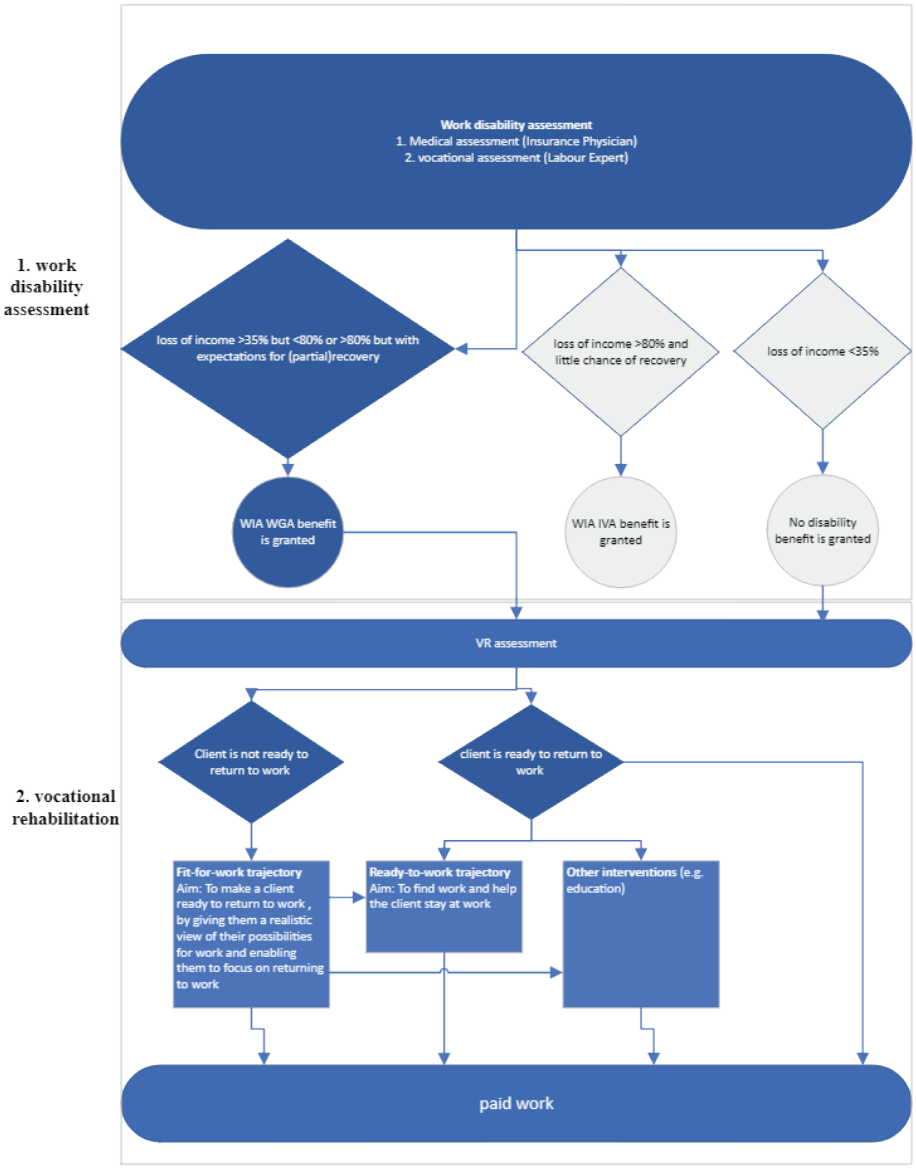


Figure 1: Illustration of the process in which an individual applies for a WIA WGA benefit and the support provided by the SSI when a benefit is granted.

Challenges in VR

VR professionals (e.g. labour experts and caseworkers) are tasked with identifying which barriers prevent a person from returning to work and identifying which interventions are most suitable to help the person return to work. This is not easy.

VR professionals have limited time to do this assessment, while clients often have multiple and complex problems (6). The choices VR professionals make on which factors are most important to address in helping a client return to work and which interventions should be advised to target these barriers, are primarily practice-based. This could lead to unwanted practice variation. There is a need to make these VR services more evidence-based.

In addition, the VR services clients receive are currently not based on a shared decision making process, while clients do have the wish to participate in such a process (11, 12). If clients have the feeling that they are involved, this increases their amount of experienced competency, autonomy and their relatedness to the process (13).

Thus society, VR professionals and clients receiving a work disability benefit would benefit from more evidence-based VR based on shared decision making. It is imperative to develop more efficient and evidence-based VR.

Towards an evidence-based practice for VR professionals

Evidence-based VR and involvement of clients in the VR process can be supported by developing and implementing tools and guidelines. A few tools already have been developed that can support VR professionals in identifying the return-to-work (RTW) barriers of the client (14, 15). Although these tools assess barriers for RTW, they do not help the VR professional in choosing interventions that can contribute to solving these barriers in order to facilitate return to work.

Decision aids or decision support tools “are devices, instruments, questionnaires or other diverse resources (including algorithms, continuums of care, and treatment models) that present knowledge to health care decision-makers, and are often designed as point-of-care resources that support decisions regarding optimal treatment choices” (16). Decision aids are already often used in the curative sector/clinical medicine, for example to select interventions for patients with disabling musculoskeletal disorders (16). A decision aid could be a helpful tool to aid the VR professional in identifying relevant barriers together with the client, and in choosing effective interventions to target these barriers together with the client. Although there are several tools used in VR, such an extensive decision aid to help people with a long-term work disability pension return to work does not exist yet.

Aim and outline of this thesis

The overall aim of this thesis was to develop and test an evidence-based decision aid for VR professionals in order to enhance the quality of VR for individuals with a long-term (partial) work disability, in order to increase their chances on work participation.

The primary objectives of this thesis are threefold:

1. To describe the current Dutch VR services for people who receive a (partial) work disability pension (Chapter 2);
2. To develop an evidence-based decision aid to support clients and VR professionals in VR to improve return to work and to reduce practice variation (Chapter 3 & 4), aimed at:
   a. Identifying the most important RTW barriers for people receiving a work disability pension;
   b. Selecting the most suitable VR interventions to address these RTW barriers;
3. To test the efficacy and feasibility of the evidence-based decision aid by:
   a. Evaluating the efficacy of the decision aid on identifying the most important RTW barriers and selecting the most suitable VR interventions compared to usual care (Chapter 5);
   b. Evaluating the feasibility of implementing and using the decision aid in practice among clients and professionals (Chapter 6).

In the final chapter, Chapter 7, I will discuss the findings of this thesis and give recommendations for future research, policy and practice.

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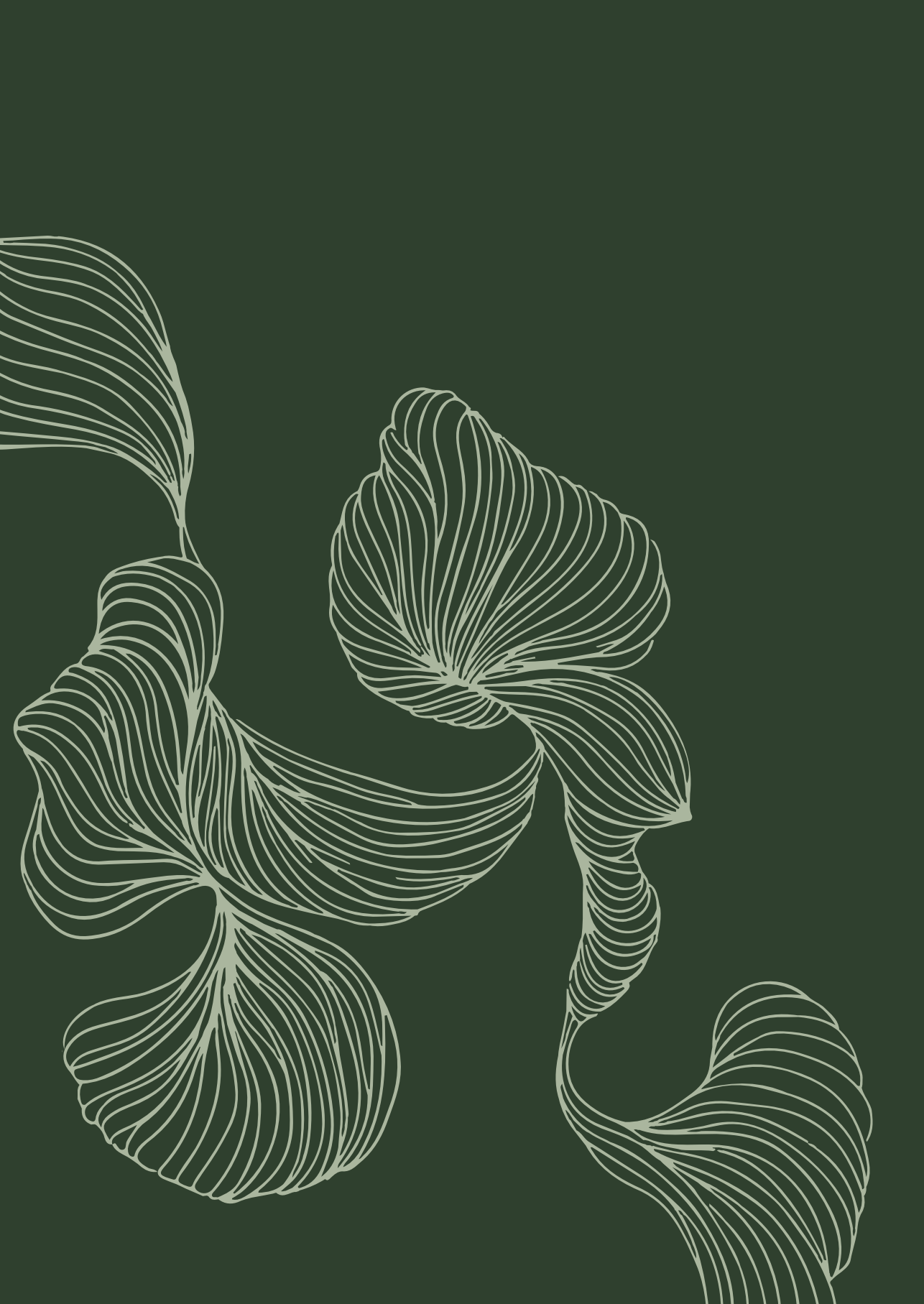

CHAPTER 2

Tailored vocational rehabilitation for people with a work disability pension in The Netherlands; an in-depth data analysis of the content and outcomes of vocational rehabilitation trajectories of the Social Security Institute

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Abstract

Purpose: People with a work disability pension receive vocational rehabilitation (VR) services from the Dutch Social Security Institute (SSI) in order to facilitate return-to-work (RTW). The SSI offers tailored VR existing of two trajectories (aimed at getting fit for work or aimed at returning to work). The purpose of this study is to describe the current practice of VR. This includes a description of client characteristics, RTW barriers and the intensity, duration, content and the outcomes of the offered trajectories.

Materials and Methods: We analyzed data from 197 clients that were randomly selected from clients who attended a VR trajectory between 1 January 2017 and 31 December 2018. Data were obtained from the SSI registration databases and client files.

Results: Both VR trajectories at the SSI have a different aim, but in practice the content of the VR interventions often overlaps. Around half of both trajectories reached their goal. Reasons for unsuccessful trajectories were that the client did not find work or barriers were more complex than initially assessed.

Conclusions: The SSI delivers tailored VR to the specific needs of the client, however substantiations for why a certain VR intervention is offered are limited. Guidelines are needed to support professionals.

Keywords: Disability pension, labor experts, vocational rehabilitation, social security, long-term sick leave

Introduction

People with long-term disabilities often experience difficulties with returning to work [1]. Compared to people with a shorter period of sick leave, people with a long-term disability experience longer periods of absence from work and are more likely to never return to work, especially without appropriate and timely interventions [2]. Therefore, many OECD countries have introduced labor market policies to help people with disabilities return to work [3,4]. These policies exist out of "passive" measures, such as disability and/or unemployment benefits (social insurance), and "active" measures, such as vocational rehabilitation (VR) interventions, job-search assistance and coaching on the job. These may be either permanent or temporary. Since 2007, many OECD countries are shifting their focus towards the latter: promoting return to work and thus exploiting the remaining work capacity, using active labor market policies [3-5]. The Dutch situation is explained in text block 1.

VR interventions, aimed at returning to work are however not always successful for people with a (long-term) work disability [5-7]. The effectiveness of an intervention depends on several factors. First of all, it is influenced by the characteristics of the client. Not only does the type of disease (e.g. [8]) influence which VR intervention is effective to help a person to return to work, but also other characteristics, such as age, previous sick leave [9] and psychological characteristics [10] play a role. People with a long sick-leave duration often experience multiple problems, such as health problems, financial problems and housing problems, while VR interventions often lack a holistic approach to target the multiple problems these people experience [11,12]. This was also acknowledged by Aasdahl et al. [13], who showed in their review that people on long-term sick leave need more complex interventions. Their review shows that there is no "golden hour" to deploy a VR intervention, but that different moments in a person's process of vocational rehabilitation need different types of VR interventions, with more complex interventions being better suited for people with long-term problems.

The Dutch Social Security Institute (SSI) offers VR trajectories to people with a long-term disability (clients). The content of a VR trajectory is tailored to the needs of the client (figure 1), and is determined by the VR professional and the rehabilitation service provider that offers the VR trajectory. Clients that are not ready to return to work directly are offered a more intense VR trajectory called "Fit-for-Work". This trajectory consists of one or more interventions containing several activities. For example, a client can receive an intervention aimed at improving the personal effectiveness, that consists of activities aimed at increasing psychological resilience and improving social skills.

The Fit-for-Work trajectory has reached its goal if: 1) the client has returned to work or education, or 2) the client is considered ready to start work or education immediately (i.e. the SSI actively helps the client to find work. For example, by establishing contact with potential employers), or 3) the client is considered not yet ready to work but ready to receive the "Ready-to-Work" trajectory. Clients who are ready to return to work, when granted the disability benefit, are offered the less intensive "Ready-to-Work" trajectory. This VR trajectory is aimed at helping the client return to work by offering interventions, such as preparing for a job interview. The Ready-to-Work trajectory has reached its goal if the client found work and remains in work for at least three months. Finally, clients that are ready to return to work but for whom the VR professional did not find the Fit-for-Work or Ready-to-Work trajectory suitable, can also be offered other interventions such as mediation towards work, education, or competency tests.

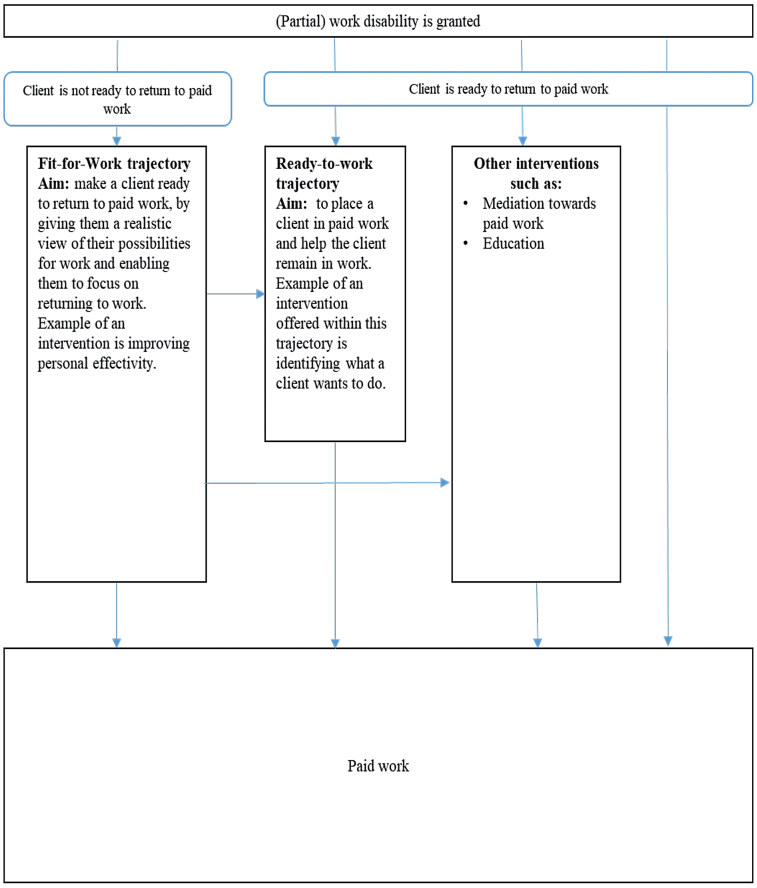

Figure 1: Vocational Rehabilitation trajectories of the Dutch SSI

The specific content of the VR trajectory is tailored to the individual. The VR professionals suggests a trajectory suited to the needs of the client, the rehabilitation service provider determines which activities it should consist of, and the VR professional approves, after which the client can start. VR professionals and rehabilitation services thus have a lot of professional autonomy to offer clients an individually tailored VR trajectory. It is important to gain insight in the content and outcomes of VR services currently offered to this group to retrieve insight on which aspects can be improved.

Therefore, the aim of this study is to describe the current practice of VR that is offered to long-term work disability benefit recipients in the Netherlands. This includes a description of client characteristics, RTW barriers and the intensity, duration, content and the outcomes of the offered trajectories

Materials and Methods

Study Design

Data was obtained from personal files of 197 clients who were granted a (partial) work disability pension. These personal files were selected using a stratified random selection from 13.604 clients who were granted a (partial) work disability pension and concluded a VR trajectory between January 2017 and January 2019. We chose this timeframe, because these clients were the first to receive the VR trajectories according to a new protocol the SSI implemented. We aimed to include 100 clients in both trajectories. In addition to the personal files, characteristics of the source population based on registration data of 13.604 clients were analyzed.

This study was approved by the Medical Ethics Committee of Amsterdam UMC, VU University Medical Centre Amsterdam (2020.0717). The committee declared that no comprehensive ethical approval was needed. We received permission from the SSI to use their (registration) data for this study.

Measures

The following data were retrieved from the personal files for the sample of 197 clients: work experience, barriers for RTW, intensity, duration, content and (substantiation for) the outcome of the VR trajectories. Data were obtained from two different types of files; rehabilitation plans and final rehabilitation files. The rehabilitation plan contains the barriers for RTW and goals for vocational rehabilitation, and is formulated by the VR professional of the Dutch SSI after a VR assessment with the client. The final rehabilitation files are initially formulated by the rehabilitation service provider, and

improved and finalized by the VR professional of the SSI. Information from these files was extracted by co-researchers employed at the Dutch SSI, who were experts in both practice and policy. A checklist was used for this.

Work experience and barriers for RTW were retrieved from the rehabilitation plans. Work experience was categorized in five categories: 1) work experience based on multiple short contracts, 2) large amount of work experience based on long-term contracts, 3) large amount of work experience, 4) unknown length of contracts, and 5) unknown work experience (not or very brief described in the files, therefore the researchers were unable to determine the amount of work experience). Barriers for RTW were categorized in 30 different categories. These barriers can be health-related (e.g. musculoskeletal limitations, visual limitations), related to psychological or behavioral characteristics (e.g. sensitive for stress) or work-related (e.g. not able to do former job, limited work history). Only barriers that were mentioned for more than 10% of the clients in a trajectory are described in the results of this study. A VR professional could indicate multiple barriers for a client.

Intensity, duration, outcome and content of the VR trajectories, and the substantiation for the outcome of the VR trajectory were retrieved from the final files (table 1). Only substantiation for the outcome of the VR trajectory that were mentioned for more than 5% of the clients are described in the results.

Data on socio-demographics (age, gender, educational level), which VR trajectory was attended and if a VR trajectory reached its goal were extracted from the SSI administrative database for the 13,604 clients who attended a VR trajectory.

Statistical Analysis

The data were summarized using descriptive statistics to describe the characteristics of the clients and the VR trajectories. All statistical analyses were performed in SPSS 26.0.

Table 1: Description of VR trajectories

	Fit-for-Work	**Ready-to-Work**
Content	Interventions: - Identifying labour market position. Activities are: • aimed at finding work • aimed at identifying what a client can do (e.g. competency test) • aimed at identifying what a client wants to do (e.g. career choice test) • aimed at becoming self-employed - Improving personal effectivity. Activities are: • Aimed at psychological improvement (e.g. motivating and increasing psychological resilience) • Aimed at physical improvement (e.g. improving vitality) • Aimed at improving social skills and social contacts • Other (e.g. increasing motivation) - Improving employee skills Activities are: • Aimed at changing behaviour (e.g. learning how to structure a day) • Aimed at improving social skills (e.g. learning communication skills) • Other (e.g. learning how to cope with disability)	Interventions: - Identifying what jobs a client wants to do (e.g. career choice test) - Identifying what jobs a client can do (e.g. compentency test) - Search for work (e.g. searching with the client for suitable jobs) - Improving job application skills - Mediation/ jobfinding - Making work suitable for a client (e.g. workplace adjustments) - Unburden the employer and the employee (e.g. coaching during internship) - Other
Max. intensity	40 hours (in exceptional cases 60 hours)	25 hours
Max. duration	18 months	9 months
Justification for successful outcome	- Has returned to work - Is ready to be mediated towards work - Is able to receive education - Is ready to receive the Ready-to-Work trajectory	- has found work within three months after completing the trajectory and remains employed for at least three months
Substantiation for not reaching the goal of the VR trajectory	- Health deteriorated - More complicated barriers than first assessed - Problems in private situation - Client did not cooperate sufficiently - Client moved away - Pregnancy - Sickness >13 weeks - Incarcerated - Other - Missing	- Health deteriorated - More complicated barriers than first assessed - Problems in private situation - Client did not cooperate sufficiently - Client moved away - Pregnancy - Sickness >13 weeks - Incarcerated - Other - Missing - Client did not find work even though client applied for many jobs - Client is demanding on which jobs to accept

Results

Of the 13,604 people in the source file that received VR between January 2017 and January 2019, most clients (11,043, 81.2%) attended the Fit-for-Work trajectory. A fifth of the clients (2,561, 18.8%) attended the Ready-to-Work trajectory. An overview of the socio-demographics of the population can be found in figure 2.

Of the 197 clients that were randomly selected from both trajectories (of three selected clients relevant files were missing), 97 received the Fit-for-Work trajectory, the other 100 clients received the Ready-to-Work trajectory.

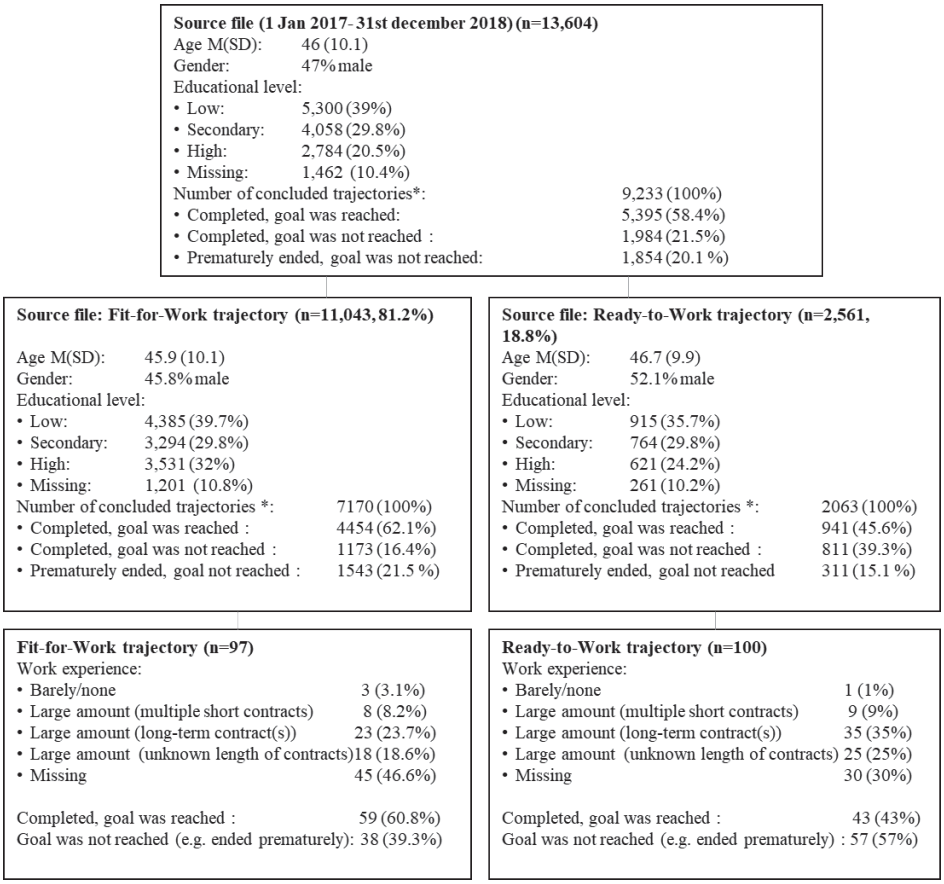

Figure 2: Descriptive baseline statistics of the VR trajectories and clients of the source file and the selected files.

Fit-for-Work

Characteristics of the fit-for-work clients

The work experience (figure 2) of clients was often not or only briefly described in the files, as a result of which the work experience could not be determined for almost half of the cases (46.4%). Most clients for which the work experience was described, had a large amount of work experience, either with long-term contracts (23.7%) or unknown length of contracts (18.6%). On average professionals observed 3.1 (range 0-8; SD 1.9) different RTW barriers for clients who attended the Fit-for-Work trajectory. Most of the observed barriers (table 2) were health-related (e.g. musculoskeletal limitations (72.2%) and sensitive for stress (35.1%).

Table 2: Baseline characteristics: RTW barriers and the intensity and duration of the trajectory

Item	Fit-for-Work (n=97) n (%)
RTW Barriers	
Musculoskeletal limitations	70 (72.2)
Sensitive for stress	34 (35.1)
Limitation of working hours	32 (33)
Not able to flexibly adjust to changes	23 (23.7)
Not able to do former job	22 (22.7)
Problems with managing aggression/conflicts	17 (17.5)
Problems in communication and/or collaboration	8 (8.2)
	Median (range)
Intensity (hours)	
All trajectories (Fit-for-Work n=91,Ready-to-Work n=100)	30 (0-60)
Trajectories which did not reach their goal(Fit-for-Work n=36, Ready-to-Work n=57)	22 (0-40)
Trajectories which did reach their goal (Fit-for-Work n=55, Ready-to-Work n=43)	34 (0-60)
Duration (months)	
All trajectories (Fit-for-Work n=91,Ready-to-Work n=100)	7 (0-18)
Trajectories which did not reach their goal (Fit-for-Work n=38, Ready-to-Work n=57)	7 (0-18)
Trajectories which did reach their goal (Fit-for-Work n=59, Ready-to-Work n=43)	7 (0-18)

Content of the Fit-for-Work trajectory

The median intensity and duration of the Fit-for-Work trajectory is described in table 2. A third of all trajectories (34%) lasted longer than the maximum duration of 18 months. On average clients received 2.3 (SD 1.85, range 0-8) different activities within the three main categories of interventions. A summary of the attended interventions and activities can be found in table 3.

Table 3: Attended interventions and activities within the Fit-for-Work trajectory

Main category of intervention	Activities within intervention are aimed at	% of clients that received the intervention
Identifying labour market position		**79.4**
	Finding work.	42.3
	Identifying what job a client can do (e.g. competency test)	38.1
	Identifying what job a client wants to do (e.g. career choice test)	35.1
	Exploring self-employment	5.2
Improving personal effectivity		**80.4**
	Psychologically (e.g. motivating and increasing psychological resilience)	30.9
	Physically (e.g. improving vitality)	8.2
	Social skills and social contacts	5.2
	Other (e.g. increasing motivation)	24.7
Improving employee skills		**61.9**
	Changing behaviour (e.g. learning how to structure a day)	9.3
	Improving social skills (e.g. learning how to communicate more effectively)	3.1
	Other (e.g. learning how to cope with disability)	25.8

Outcome of the Fit-for-Work trajectory

Of the 97 Fit-for-Work trajectories that were analyzed 59 (60.8%) were successfully completed and reached their goal. This percentages is comparable with the data retrieved from the 7170 clients who completed a Fit-for-Work trajectory (figure 2). Most commonly mentioned substantiations for reaching the goal were: “client has returned to work” (40.7%), “client is ready to receive the Ready-to-Work trajectory” (30.5%) and “client is ready to receive education (8.5%)”. Substantiations for not reaching the goal of the Fit-for-Work trajectory or ending a Fit-for-Work trajectory prematurely most often mentioned were “barriers were more serious or complicated than first

assessed" (n=17, 44.7%) and "health deteriorated" (n=11, 28.9%). All substantiations for the outcomes of the trajectory are summarized in table 4.

Table 4: Substantiations for outcomes of the Fit-for-Work trajectory

	Fit-for-Work
Substantiation for not reaching the goal of an attended VR trajectory or ending a VR trajectory prematurely (Fit-for-Work n=38, Ready-to-Work n=57)	
Barriers were more serious or complicated than first assessed	17 (44.7)
Health deteriorated	11 (28.9)
Client did not sufficiently cooperate	6 (15.8)
Problems in private situation	2 (5.3)
Client did not find work even though client applied for many jobs	NA
Other	8 (21.1)
Substantiation for reaching the goal of a Fit-for-Work trajectory (n=59)	
Client has returned to work	24 (40.7)
Client is ready to receive the Ready-to-Work trajectory	18 (30.5)
Client is able to receive education	5 (8.5)
Client can be mediated towards work	4 (6.8)
Client is going to look for work	3 (5.1)
Other: - Client's goal to do voluntary work is reached (n=2) - Client is ill and must continue the trajectory (n=1)	3 (5.1)
Not mentioned	2 (3.4)

Ready-to-Work

Characteristics of Ready-to-Work Clients (n=100)

The work experience (figure 2) could often not be determined for clients that attended the Ready-to-Work trajectory (30%). Most clients had a large amount of work experience with long-term contracts (35%) or the length of the contracts was unknown (25%). Professionals on average observed 2.56 (SD 1.4, range 0-7) barriers for clients who attended the Ready-to-Work trajectory (table 5).

Table 5: Baseline characteristics: RTW barriers and the intensity and duration of the trajectory

Item	Ready-to-Work (n=100) n (%)
RTW Barriers	
Musculoskeletal limitations	74 (74)
Sensitive for stress	48 (48)
Limitation of working hours	31 (31)
Not able to flexibly adjust to changes	12 (12)
Not able to do former job	15 (15)
Problems with managing aggression/conflicts	19 (19)
Problems in communication and/or collaboration	12 (12)
	Median (range)
Intensity (hours)	
All trajectories (Fit-for-Work n=91,Ready-to-Work n=100)	25 (0-35)
Not successful trajectories (Fit-for-Work n=36, Ready-to-Work n=57)	25 (0-25)
Successful trajectories (Fit-for-Work n=55, Ready-to-Work n=43)	23 (0-35)
Duration (months)	
All trajectories (Fit-for-Work n=91,Ready-to-Work n=100)	9 (2-9)
Trajectories which did not reach their goal (Fit-for-Work n=38, Ready-to-Work n=57)	9 (2-9)
Trajectories which did reach their goal (Fit-for-Work n=59, Ready-to-Work n=43)	9 (2-9)

Content of the Ready-to-Work VR trajectory

Nearly a third (32%) of the trajectories had a longer duration than was planned (9 months) and 43% of the trajectories had a higher intensity than the maximum planned intensity of 25 hours. An overview of the intensity and duration of the trajectory for each outcome of the trajectory can be found in table 5. On average, clients received 2.3 (SD 1.39, range 0-5) different interventions within the VR trajectory. Many clients received an intervention aimed at improving job application skills (69%) or an intervention aimed at mediation/jobfinding (55%). A summary of the attended interventions can be found in table 6.

Table 6: Attended Interventions within the Ready-to-Work trajectory

Interventions	% n=100
Improving job application skills	69
Mediation/jobfinding	55
Search for work	45
Identifying what job a client wants to do	17
Identifying what job a client can do	17
Unburden the employer and the employee	16
Other	16
Missing/not applicable	12

Outcome of the Ready-to-Work VR Trajectory

Of the 100 Ready-to-Work files that were analyzed in more detail, 43 (43%) were completed and reached their goal, which means the clients returned to work. These results are comparable with the data retrieved from the 2063 clients who completed the Ready-to-Work trajectory in the source sample (figure 2). The only reason for reaching the goal of the Ready-to-Work trajectory was by finding and staying in paid work. One of the most mentioned substantiations for not reaching the goal of the trajectory was that the client was not able to find work, even though the client did apply for many jobs (28.1%) (table 7).

Table 7: Substantiations for outcomes of the Ready-to-Work trajectory

	Ready-to-Work
Substantiation for not reaching the goal of an attended VR trajectory or ending a VR trajectory prematurely (Fit-for-Work n=38, Ready-to-Work n=57)	
Barriers were more serious or complicated than first assessed	12 (21.1)
Health deteriorated	11 (19.3)
Client did not sufficiently cooperate	1 (1.8)
Problems in private situation	4 (7.0)
Client did not find work even though client applied for many jobs	16 (28.1)
Other	26 (45.6)

Discussion

Main Findings

The aim of this study was to describe the current two VR trajectories Fit-for-Work and Ready-to-Work offered by the Dutch SSI to people receiving a long-term work disability pension. This study shows that most clients that received a VR trajectory between 2017 and 2019 received a VR trajectory aimed at making the client ready to return to work. Within this Fit-for-Work trajectory, interventions aimed at identifying the position on the labor market and improving personal effectivity were attended the most. Barriers that were health-related, such as musculoskeletal limitations and sensitivity for stress were most often observed to obstruct the client from returning to work. Within the Ready-to-Work trajectory the interventions are mostly aimed at improving job application skills and mediation/jobfinding. The Fit-for-Work trajectory of which the goal was reached if the client had paid work or was ready to continue VR, looking for work or start education, reached its goal in 60.8% of the cases. The Ready-for-Work trajectory reached its goal in 43% of the cases which meant clients found and remained in paid work for three months. For both trajectories, most observed reasons for not reaching the goal of the VR trajectory, were that the client had more complex barriers than initially assessed and the clients health deteriorated.

Interpretation of the Findings

The Dutch SSI aims to offer tailored care to people receiving a work disability pension. Based on the results of this study we conclude that the SSI indeed offers tailored care to their clients, based on a VR trajectory that can exist of one or more VR interventions that are selected based on individual preferences. However, we also conclude that the documented substantiations for why a client is offered one of the VR trajectories and why the client receives certain VR interventions within the VR trajectory are limited. Personal characteristics, such as work experience, are often not described and only a limited number of the barriers that prevent a person from returning to work is documented. Additionally, the two VR trajectories are more similar in practice than on intended. VR interventions within the different VR trajectories can overlap and trajectories often last longer than planned. Traceable substantiations of why a client is offered a certain VR trajectory and certain VR intervention(s) is limited.

The results show that of the trajectories that were concluded (either completed with or without reaching the goals or ended prematurely) , 60,8% of the Fit-for-Work trajectories and 43% of the Ready-to-Work trajectories reached their goal. However, the actual success rate may be lower. The success rate in this article is calculated only on the trajectories which were concluded (officially ended)in this period of time. This

means that trajectories that started just before the end of the inclusion period and therefore have not yet had the opportunity to be completed were excluded, but also trajectories of a long duration which may have been less likely to reach its goal. If we calculate the success rate of all trajectories that were started in this period of time, 40% of the trajectories reached their goal (N=5,395/13,604).

The results also show that one of the most important reasons a VR trajectory not reaching its goal was that the RTW barriers were more serious or more complicated than initially assessed. It seems VR professionals experience difficulties in identifying the extent of most relevant barriers and in correctly assessing the personal situation of the client. This is a difficult task, especially within a limited timeframe. The lack of scientific evidence on which barriers play a role in the RTW of people with a long-term sick leave makes it even more challenging [14]. Evidence-based guidelines and tools could help VR professionals identify RTW barriers, and choose suitable VR trajectories and VR interventions. Studies show that evidence-based practice can increase the quality of VR services and help improve RTW outcomes [15]. In our research we showed that tools, such as a decision aid, can help reduce practice variation among VR professionals [16].

This study provides insight into the usual care of the Dutch SSI and shows that a clear substantiation for selecting a certain type of VR intervention for a client is often missing in personal files. This may mask unwanted practice variation and a lower RTW of clients.

Comparison with other Studies

Our finding that many VR trajectories did not reach their goal is in line with results from other studies that show that people with a long-term disability often do not return to work, even though (many) VR interventions are offered. For example, a study among cancer survivors showed that 22.8% returned to work after 1 year[17], a study among people with mental illness/chronic pain showed that 22.7% returned to work after 1 year [18], and a study among people with mood and anxiety disorders showed that 41.4 % returned to work or education after 2 years[19]. Often, these people have complex disorders that are difficult to treat and often they suffer from comorbidity[1]. On top of this, people receiving a long-term work disability often face multiple personal, social and/or environmental problems, which make interventions less successful [20].

Strengths and Limitations

This study has several strengths. One strength of this study is that we were able to observe the usual VR services for an representative sample of all people that received vocational rehabilitation between 2017 and 2019. We used detailed information from personal files to get an in-depth overview of the clients' characteristics and the content of the VR interventions. Additionally, a major strength of this study is that we combined the in-depth information obtained from the personal files of an representative sample on the one hand, with the general information of the whole source population of 13,604 clients on the other hand.

A limitation of this study is that the in-depth data had to be retrieved by hand from the files, which made it impossible to retrieve the information for the entire population. However, we do not expect a bias in the data due to our sample being representative for the population. On top of this, the data was not registered primarily for research purposes, but for administration purposes to provide VR services. Although registering information is important for VR professionals, they often did not document all information that was desirable for our study, such as work experience. Another limitation of this study is that not all barriers that could be important for the return to work of the client, for example known from academic literature, were documented. Important RTW barriers for work disability benefit recipients, such as illness perception, societal participation and importance of work, are not registered by the SSI [14].

Another limitation of this study is that we, due to limitations of the data, could not include in our analysis whether people who attended a Ready to work trajectory, first had followed a Fit for Work trajectory. This lack of data prevented us from comparing the outcomes of people who followed either one of the trajectories or a combination of both. However, it should be noted that higher success rates for one of these groups do not necessarily mean a higher effectiveness, since the trajectory people end up in is chosen by a professional, and highly dependent on their distance to the labor market at that time, and thus their chances of work participation.

Implications for Practice, Policy and Research

The Dutch SSI intended to divide their VR services in two separate VR trajectories. This study shows that in practice the trajectories are entangled. VR interventions that belong to one VR trajectory are offered while clients are appointed to the other VR trajectory. We therefore were not able to evaluate the VR trajectories separately.

The information from this study can help social security institutes professionalize their VR service, increase learning from past experiences, limit unwanted practice variation, and can support in developing evidence-based vocational rehabilitation. The SSI should investigate if guidelines and/or tools, and documenting client characteristics and perspectives, can help improve the quality of their VR and improve RTW outcomes for clients. The SSI can improve their VR service by paying more attention during the VR assessment to previously attended VR interventions. Giving more attention to past VR interventions helps to identify better fitting content of the subsequent VR trajectory.

Since many trajectories were not completed within the established maximum duration of the trajectory, the SSI should consider whether more time may be needed to support this particular group of clients to return to work.

Conclusion

This study aimed to describe the current practice of VR that is offered to work disability benefit recipients in the Netherlands. The Dutch SSI aims to offer vocational rehabilitation tailored to the needs of the client. The results show that documented substantiations for offering a certain type of VR to a client are often limited, which can mask unwanted variation in the VR service clients receive and make it difficult to evaluate the effects of the current professionals practice for clients. The use of tools and guidelines could help professionals in identifying and documenting relevant information and in supporting their decision making when selecting VR interventions for a client. This could improve VR services and clients' RTW outcomes.

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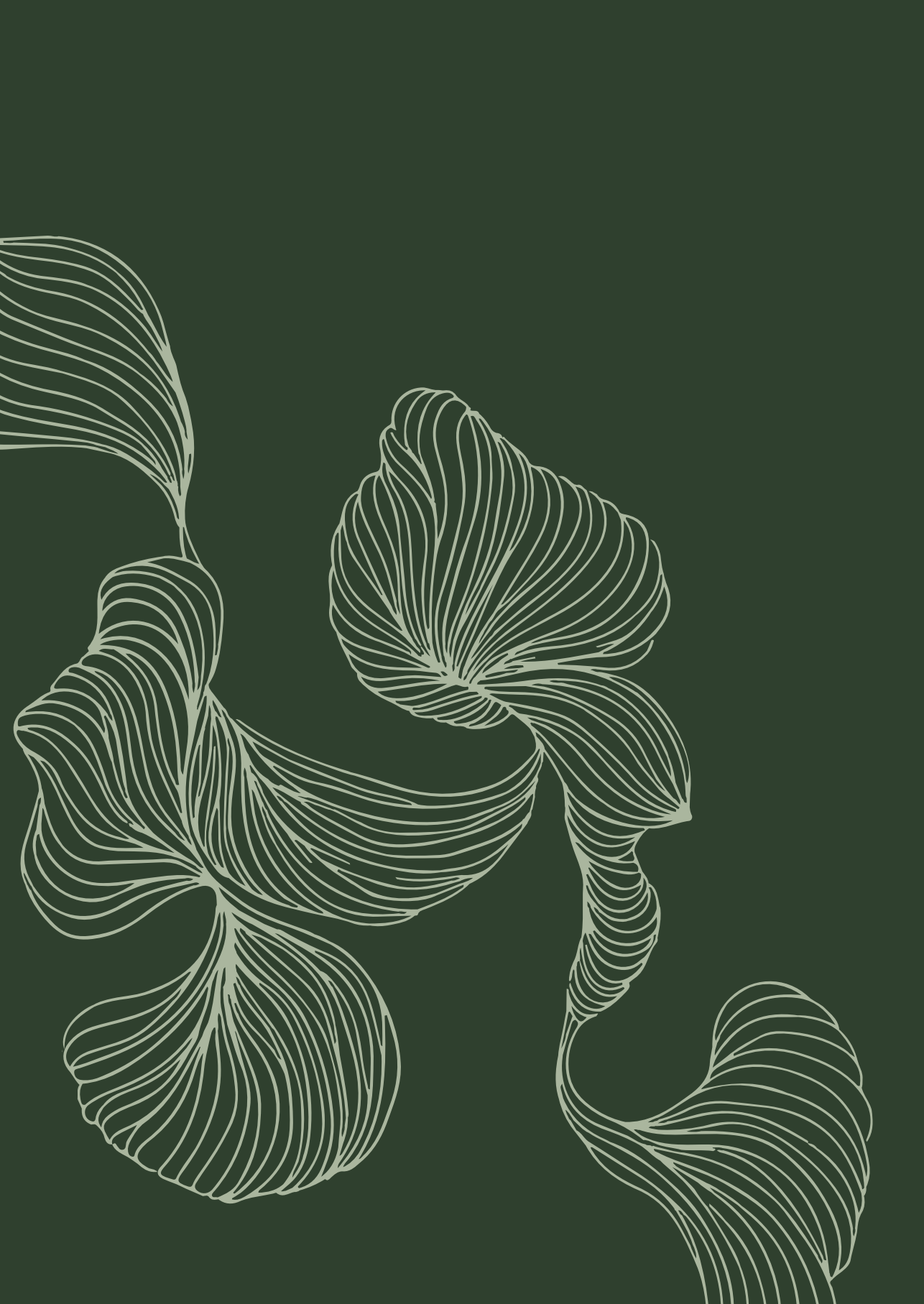

CHAPTER 3

Elements of return-to-work interventions for workers on long-term sick leave: a systematic literature review

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Abstract

Purpose: The aim of this systematic review is to identify vocational rehabilitation (VR) interventions that are effective to enhance return-to-work (RTW) for people on long-term sick leave (>90 days) and to identify main elements of these interventions.

Methods: Six electronic databases were searched for peer-reviewed studies published up to February 2022. Each article was screened independently by two different reviewers. Thereafter, one author performed the data-extraction which was checked by another author. The EPHPP quality assessment tool was used to appraise the methodological quality of the studies.

Results: 11.837 articles were identified. 21 articles were included in the review, which described 25 interventions. Results showed that ten interventions were more effective than usual care on RTW. Two interventions had mixed results. The effective interventions varied widely in content, but were often more extensive than usual care. Common elements of the effective interventions were: coaching, counseling and motivational interviewing, planning return to work, placing the worker in work or teaching practical skills and advising at the workplace. However, these elements were also common in interventions that were not effective on RTW compared to usual care and can therefore not explain why certain interventions are effective and others are not.

Conclusion: The effective interventions included in this study were often quite extensive and aimed at multiple phases of the RTW-process of the worker. In the future, researchers need to describe the population and the content of the investigated interventions more elaborate to be able to better compare VR interventions and determine what elements make interventions effective.

Keywords: disability pension, vocational rehabilitation, RTW, work disability, intervention

Background

Long-term sickness absence has consequences for a person's social and psychological well-being (1-3) and leads to high costs for society (4, 5). Thus, it is important for these people to return to work sustainably as fast as possible. To increase their chances of returning to work, they are often supported in their return to work process, by offering them vocational rehabilitation (VR) interventions. Scientific evidence for the elements that these VR interventions should consist of to make them effective is lacking.

Literature shows that VR interventions are most effective if they are offered early in the return to work (RTW)-process (6) and thus prevent people from becoming long-term work disabled. These studies show that a focus on RTW, behavioral activation, and on psychoeducation (7) and a multidisciplinary approach (6) are elements of effective VR interventions for people with a shorter sick leave duration. However even though there are examples of interventions that are effective for people with a longer duration of sick leave (8), it remains to be seen if these contain the same elements. A reason why different interventions are effective in a later stage of the RTW-process could be that people on long-term sick leave often experience multiple problems that play an important role in prohibiting them from returning to work (8, 9) that take more time to address. On top of this, they often suffer from multiple disorders (10), experience multiple psychosocial problems (11) and multiple social disadvantages (12) in comparison to people with shorter sick leave. VR interventions, specifically targeting people on long-term sick leave should address these problems, to increase work participation of this group.

Currently, there are no reviews available that explore intervention elements of VR interventions that are effective on RTW for people on long-term sick leave, however a few reviews investigated which type of interventions are effective on RTW. A review by Aasdahl and Fimland (8) showed that more complex interventions, such as a combination of an occupational intervention and a clinical intervention, are effective on RTW for people with a long-term illness. An overview of systematic reviews by Levack (13) to examine the effectiveness of vocational intervention for people with a chronic illness on returning and maintaining work, showed that supported employment is an effective intervention for people with chronic illness. For other VR interventions no final conclusion was reached, due to a lack of high-quality studies.

In order to better understand why certain VR interventions are effective to support people on long-term sick leave with their return to work, while others are not, it is important to identify elements of these interventions that might explain their effectiveness. This insight can be used to develop more effective VR interventions. The only review that investigated the elements of effective interventions for people

on longer-term sick leave focused exclusively on mental disorders (1). This study showed that interventions with contact to the workplace (e.g. refamiliarization with workplace) and multicomponent interventions are effective. It is of interest to see if these elements are also present in interventions that are effective for people on long-term sick leave because of a wide range of disorders.

This review aims to identify which VR interventions are effective for the RTW of people on long-term sick leave or receiving a work disability pension for more than 90 days, regardless of the type of disorder they have. Additionally, this review aims to identify the main elements of these effective VR interventions in comparison to the usual care.

Methods

We performed a systematic literature review. We included studies that investigated the effect of VR interventions on RTW among long-term (>90 days) sick-listed workers in accordance with the Preferred Reporting Items for Systematic Reviews and Meta-Analysis (PRISMA) statement ((14); www.prisma-statement.org). A protocol of this review was registered at PROSPERO (CRD42022104283).

Search strategy

A comprehensive search was performed in the bibliographic databases PubMed, Embase.com, APA PsycInfo (via Ebsco), Cinahl (via Ebsco), Scopus and the Cochrane Library from inception to February 7th 2022, in collaboration with a medical librarian (LS). Search terms included controlled terms (MeSH in PubMed, Emtree in Embase, Thesaurus terms in PsycInfo and Cinahl Headings in Cinahl) as well as free text terms. The following terms were used (including synonyms and closely related words) as index terms or free-text words: 'return to work' and 'disability insurance' and 'interventions'. We used four blocks in our search strategy (appendix 1) to search studies that fit our PICO. Block 1 (e.g. absenteeism) and 2 (e.g. disability insurance) described the population and outcome, block 3 described the type of intervention (e.g. vocational rehabilitation) and block 4 described the type of study (e.g. controlled clinical trial). Since we included all types of usual care as control condition we did not include terms referring to a certain type of control. A search filter was applied to limit results to randomized controlled trials. The search was performed without date restrictions. Duplicate articles were excluded by a medical information specialist (LS) using Endnote X20.0.1 (Clarivate™), following the Amsterdam Efficient Deduplication (AED)-method (15, 16). The references of the included articles and known systematic literature reviews (6-8, 17, 18) on the same topic were checked for additional relevant studies. The full search strategies for all databases can be found in the Supplementary Information (Appendix 1).

Selection process

Two reviewers (CdG and MdMB) independently screened all potentially relevant titles and abstracts for eligibility using Rayyan (19). Studies were included if they met the following criteria: (i) Employees and former employees of working age (18-67 years) who were (partially) sick-listed or received a work disability pension for at least 90 days on average at baseline, and who were absent from work for either work-related or non-work-related reasons. Studies which did not mention the sick leave duration of the participants or which included veterans were excluded; (ii) Interventions aimed at enhancing return to work or vocational rehabilitation. Medical interventions aimed at the treatment of the disease (e.g. drugs, surgeries) were excluded; (iii) Randomized controlled trial; (iv) Study involving RTW-related outcome measures (e.g. return-to-work, work retention, absenteeism, work status, competitive employment, time to RTW). Studies that were not published in a peer-reviewed academic journal or written in a different language then English were excluded. After screening based on title and abstract, the full text of the articles were independently checked by the two reviewers for the eligibility criteria. In case of disagreement, the disagreement was solved through discussion. If there was no consensus after discussion, a third reviewer (MH) decided if the article should be included in the review.

Data extraction and synthesis

One author (CdG) extracted the data from the studies. This data was checked by another reviewer (MdMB). In case of discrepancies in the data extraction, the data extraction was discussed until consensus was reached. Data extraction to identify the different elements of the interventions was conducted by reviewer CdG and reviewer JvR, independently. Differences between the reviewers was discussed with reviewer MH.

Due to the expected heterogeneity of the included interventions a narrative synthesis was conducted based on the steps developed by Popay et al. (20): 1) developing a preliminary synthesis, 2) exploring relationships in the data and 3) assessing the robustness of the synthesis product. In order to develop a preliminary synthesis and explore relationships in the data, we extracted data from the articles on general study elements (e.g. authors, year of publication, study design, type of outcome measure) and participant elements (number of participants, age, gender, type of disease, average sick leave duration, job elements). Next, the elements of the interventions were extracted from the included articles using a deductive synthesis. Based on the elements of the first six analyzed articles and categories used in three other reviews (6, 7, 21) a framework was developed. The elements of the other articles were categorized according to this framework. If elements did not fit in the framework, new categories were added. The intervention elements according to the framework are described in table 1.

Table 1: description of intervention elements

Intervention elements	Description
1. Preparing the worker for RTW	**Aim of the intervention is to prepare the worker to RTW; at the end of the intervention, the worker is ready to find and start work**
Identifying problems for RTW	- Identifying barriers for RTW (either medical, psychological or social) - Identifying personal situation (e.g. work history, social situation) - Identifying functional status
Formulating rehabilitation plan	Describing the vocational rehabilitation process of the worker
Psycho-education aimed at RTW	Learning the worker how to deal with their pain or psychological problems, or improve their coping.
Counselling/coaching/motivational interviewing	Aimed at stimulating and motivating the worker on different aspects of RTW
Cognitive behavioral therapy (CBT)/ Acceptance and Commitment Therapy (ACT)/cognitive restructuring	Psychological interventions based on (aspects of) CBT, ACT or cognitive restructuring. Aimed at a cognitive or behavioral change. Can be aimed at different aspects such as goal setting, stress management, pain management.
Physical training (outside the workplace)	Physical training, such as a functional restoration program, relaxation exercises or exercises aimed at increasing strength. Often aimed at reducing pain and increasing physical skills outside of the workplace.
Targeting external factors	Targeting external factors, such as the financial situation and housing. Sometimes third parties are contacted to solve these problems.
2. Helping the worker find work	**Aim of the intervention is to help the worker find work, train the worker in finding work or place the worker in work**
Teaching practical skills	Work-related training (e.g. training how to apply for a job)
Planning return to work	Formulating a plan on how to return to work
Searching for work	Searching work for the worker, contact with possible employers or giving worker advice on how to find work.
Placing in work	Worker is placed in (paid) work
3. **Helping the worker remain in work**	**Aim of the intervention is to help the worker who has returned to work stay in work by offering advice, exercises or remaining in contact**
Physical training	Physical exercises at the workplace
Advice at work	Aimed at staying in work (e.g. workplace adaptions, contact with employer)
Follow-up meeting(s)	One or more booster sessions after the end of the intervention

We described the strength of our evidence-based on the quality and quantity of the primary studies included in the review. Two reviewers (CdG and MdMB) independently evaluated the methodological quality of the full text papers using the EPHPP quality assessment (22). The EPHPP tool was used to assess the quality of a study on six categories (selection bias, study design, confounders, blinding, data collection methods and withdrawals and drop-outs). For each category the studies were scored weak, moderate or strong. Based on these ratings a global rating was calculated. Studies received a strong global rating if they had no categories with a weak rating, a moderate global rating if they had one category with a weak rating or a weak global rating if they had two or more categories with a weak rating. The construct and content validity of the EPHPP tool have been demonstrated (23). Differences in judgement were resolved through a consensus procedure. If consensus could not be reached, the item was discussed with reviewer MH and resolved

Results

Study search and inclusion

The literature search generated a total of 23740 references: 4230 in PubMed, 3940 in Embase, 2211 in Cinahl, 975 in PsycInfo, 4886 in the Cochrane Library and 7498 in Scopus. The flow chart of the search and selection process is presented in figure 1. We identified 333 possible relevant articles in the database of which the full-text was assessed. During the search we identified 38 relevant systematic reviews of which the reference lists were assessed for eligible studies. At the end we also checked the reference lists of the eligible articles to identify additional articles. In total we checked the full text of 389 studies. Twenty-one studies were included. The 21 studies describe 25 different interventions. For one study a subsample of workers on long-term sick leave was used (24). For another study the sample was divided in two subsamples based on sick leave duration (average sick leave duration of 3 months and 26 months) (25), we describe the outcomes of the intervention for both subsamples.

Quality of included studies

Quality ratings are shown in table 2. Of the 21 identified articles, eight were assessed as weak in the global rating (26-33), nine studies were assessed as moderate (24, 27, 34-40), and four studies were assessed as having a strong quality (25, 41-44). Selection bias was present in many studies due to a low participation rate of the invited participants. Since only randomized controlled trials (RCT's) were included, the study design was mostly assessed as strong.

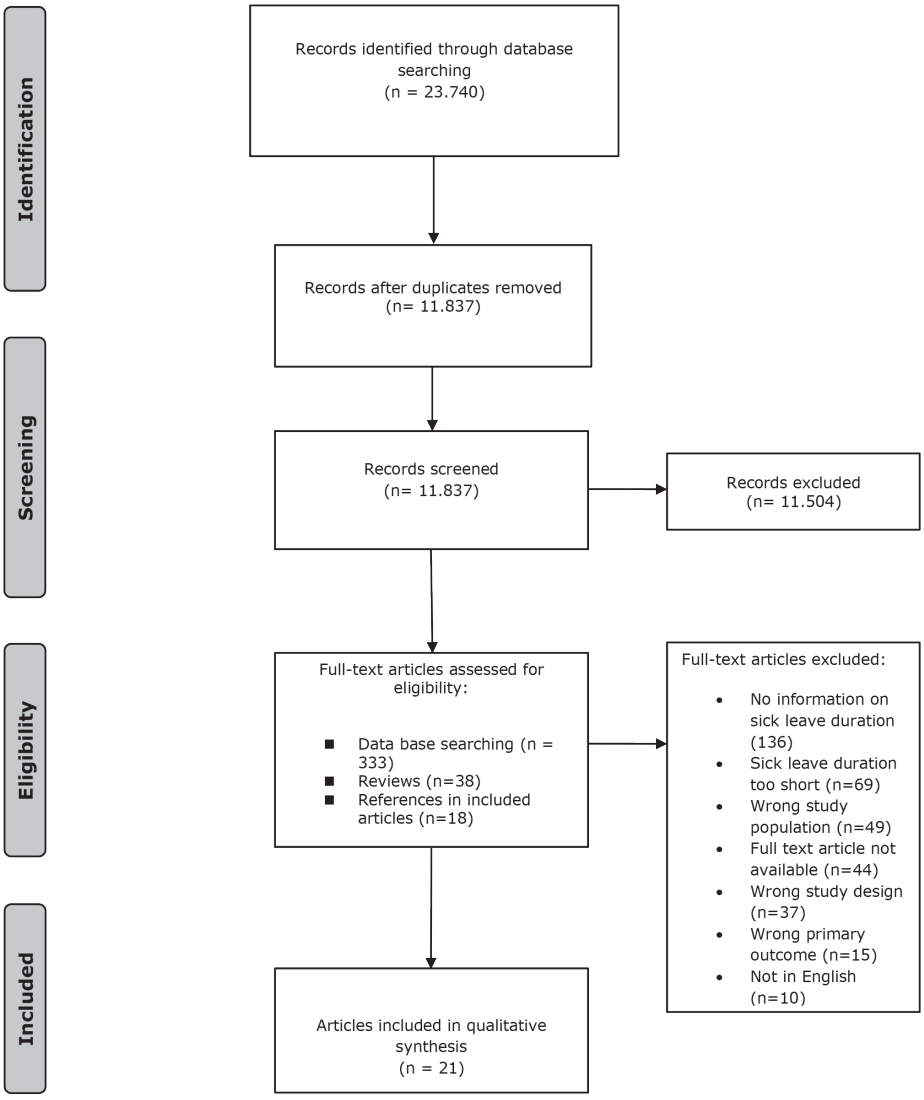

Figure 1. Flowchart of the search and selection procedure of studies

However, if the randomization was not properly described, study design was rated 'moderate'. Blinding was often assessed as weak due to participants not being blinded to the condition (intervention or usual care group) they were allocated. The data collection methods were often assessed as weak, because self-reported questionnaires were used to measure return-to-work instead of more reliable methods, such as using data obtained from registries of social security institutes.

Table 2: results of quality assessment (according to the criteria of the EPHPP quality assessment)

Article ID	Selection bias	Study design	Confounders	Blinding	Data collection methods	Withdrawals and dropouts	Global rating
Berglund (26)	weak	moderate	strong	moderate	weak	moderate	weak
Blonk (34)	weak	moderate	strong	moderate	strong	moderate	moderate
Cheng (27)	moderate	moderate	strong	moderate	weak	strong	moderate
Corey (28)	moderate	strong	strong	moderate	weak	weak	weak
Della-Posta & Drumond (35)	moderate	moderate	moderate	moderate	weak	strong	moderate
Drake (45)	weak	strong	weak	moderate	weak	strong	weak
Fleten (24)	moderate	strong	strong	moderate	strong	weak	moderate
Hees (29)	weak	strong	strong	moderate	weak	moderate	weak
Heinrich (30)	weak	strong	strong	weak	strong	strong	weak
Hellstrom (44)	strong	strong	strong	moderate	strong	moderate	strong
Huibers (31)	weak	strong	strong	moderate	weak	strong	weak
Lambeek (41)	moderate	strong	strong	moderate	strong	strong	strong
Li-Tsang (42)	moderate	moderate	strong	moderate	strong	strong	strong
Lytsy (36)	weak	strong	strong	moderate	strong	strong	moderate
Magnussen (37)	weak	strong	strong	moderate	strong	strong	moderate
Marhold (25)	moderate	moderate	strong	moderate	strong	strong	strong
Myhre (38)	weak	strong	strong	moderate	strong	strong	moderate
Nilsson (32)	moderate	moderate	strong	moderate	weak	weak	weak
Park (39)	strong	strong	strong	moderate	weak	strong	moderate
Van der Feltz (40)	weak	strong	strong	moderate	strong	moderate	moderate
Van Egmond (33)	weak	strong	strong	weak	strong	moderate	weak

Table 3: General study characteristics

Author, publication year, country	**Sample; *N, sex* (% female), mean age (SD), (average) sick leave duration**	**Target population (average) sick leave duration**	**Intervention 1 General description Providers**
Berglund et al. 2018, Sweden	**N**=427 **Sex**: 93.9% female **Mean age**: 48.7 yrs (SD 8.3) **Average sick leave duration**: 7.7 years	People on long-term sick leave or temporary disability pension due to a mental illness and/or pain-related diagnosis.	**Description**: Multidisciplinary Treatment aimed at identifying strengths and limitations for RTW and establishing an individualized rehabilitation plan which was followed. **Providers**: Psychologist, physician, occupational therapist, social worker
Blonk et al. 2007, The Netherlands	**N**=122 **Sex**: 19% female **Mean age**: 42 yrs (SD 7.9) **Average sick leave duration**: Not mentioned	Self-employed people with psychological complaints receiving a disability pension for more than 52 weeks	**Description**: Cognitive Behavioral Treatment (CBT): aimed at cognitive restructuring and registration of symptoms and situation. 11 two-weekly sessions of 45 minutes per session **Provider**: Psychologist
Cheng & Hung 2007, Hong Kong	**N**=103 **Sex**: 23.4% female **Mean age**: 32.3 yrs **Average sick leave duration**: 137.9 days (workdays lost since injury)	People with work-related rotator cuff tendinitis, with at least 90 days since claim filing/date of injury and physically fit to start functional training and work trial. Willing to participate	**Description**: Workplace-based work hardening training: aimed at improving physical health And improve functional restoration and work specific adaption **Provider**: Job coach
Corey et al. 1996, Canada	**N**=214 **Sex**: 32% female **Mean age**: 64% < 45 years; 36% > 45 years **Average sick leave duration**: 4.6 months (duration of disability)	People with a work-related soft tissue injury with disability longer than would be expected, totally disabled from work, receiving wage loss benefits at least 90 days after injury	**Description**: Functional restoration program: aimed at restoring function to lead to control, diminution and in some cases resolution of the pain. **Provider**: Not mentioned
Della-Posta & Drummond 2006, Australia	**N**=39 **Sex**: 28.2% female **Mean age**: 41 yrs **Average sick leave duration**: 39.4 weeks	People who received deployment assistance, ready to secure employment and were looking for a new employer	**Description**: CBT+ usual care: aimed at reducing depression, anxiety and stress levels and thus increasing perceived work capacity and work outcomes **Provider**: Not mentioned

Intervention 2 **General description** **Providers**	**Comparison**	**Primary outcome measure** **Follow-up**
Description: Acceptance and Commitment therapy. Psychological therapy to increase function and quality of life to increase psychological flexibility. Sessions were one hour long at the clinic or at home **Providers**: Psychologist	Usual care: regular contact with the SSIA/ SPES and healthcare providers	**Primary outcome measure**: RTW: proportion of wage due to more work increased **Follow-up**: At 12 months
Description: Combined intervention: aimed at stress-management, advice on work processes and reducing workload, job demands and increasing decision latitude. 5/6 sessions of 1 hour, twice a week. **Providers**: Labour experts	No treatment: two brief sessions with general practitioner	**Primary outcome measure**: RTW: length of time until (partial) return to work **Maximum duration of observation period:** 360 days.
Not applicable	Usual care: clinic-based work hardening training	**Primary outcome measure**: RTW: resumption of occupational activities and type of duties **Follow-up**: At 4 weeks
Not applicable	Usual care: referred back to treating physician with recommendations for proactive management.	**Primary outcome measure**: RTW: work status **Follow-up**: Ranging from 9-27 months
Not applicable	CAU: job search program. Aimed at goal setting, resume preparation and job search skills.	**Primary outcome measure**: RTW: Length of time until obtaining employment **Maximum duration of observation period:** 10 weeks

Author, publication year, country	Sample; *N, sex* (% female), mean age (SD), (average) sick leave duration	Target population (average) sick leave duration	Intervention 1 General description Providers
Drake et al. 2013, USA	**N**=2238 **Sex**: 52.7% female **Mean age**: 43.5 yrs **Average sick leave duration**: 97.9 months on SSDI	People with schizophrenia or a mood disorder, interested in gaining employment who received a disability pension	**Description**: The intervention, based on the chronic care model (13) existing out of the individual placement and support model of supported employment, systematic medication management, and other behavioral health services. **Provider**: Nurse, nurse care coordinator, team psychiatrist
Fleten & Johnsen 2006, Norway	**N**=332 **Sex**: 60.7% female (in entire population) **Mean age**: 40.4 years (in entire population) **Average sick leave duration**: 231.1 days	People with musculoskeletal or mental disorders who were sick-listed > 14 days	**Description**: Minimal intervention package: aimed at informing on available work measures, asking questions on the expected length of the current sick leave and on any relevant work adjustments for the ongoing sick leave. **Provider**: Not applicable
Hees et al. 2013, The Netherlands	**N**=117 **Sex**: 53% female **Mean age**: 43 years **Average sick leave duration**: median: 4.8 months	People with a major depressive disorder who have a possibility to RTW and a relationship between the depressive disorder and the work situation and have At least 35% absenteeism and at least 8 weeks absenteeism or duration of depressive disorder > 3 months	**Description**: Occupational Therapy + TAU: aimed at problem clarification an intervention based on the Quality of Work model to create a balance between work demand and work capacity and a follow-up **Providers**: Occupational therapists
Heinrich et al. 2009, The Netherlands	**N**=254 **Sex**: 7.9% female **Mean age**: 45.2 years **Average sick leave duration**: 8.8 weeks (after 52 weeks waiting time)	Self-employed people with musculoskeletal disorder receiving a disability pension for more than 52 weeks	**Description**: PT: Physical Training without a cognitive behavioural component and workplace specific exercises aimed at improving physical capacity, to learn to cope with complaints and to stimulate correct postures/movements **Providers**: Physiotherapists or trainers

Intervention 2 **General description** **Providers**	**Comparison**	**Primary outcome measure** **Follow-up**
Not applicable	Usual care: e.g. outpatient physician visits, medications and hospital care	**Primary outcome measure**: Employment status (any paid employment and competitive employment **Maximum duration of observation period:** 25 months
Not applicable	Usual care: no information package	**Primary outcome measure**: Length of sick leave **Maximum duration of observation period:** 55 weeks
Not applicable	Treatment as usual: treatment by psychiatric residents/senior psychiatrist. Including psychoeducation, supportive therapy and cognitive behavioural interventions	**Primary outcome measure**: RTW: time until partial/full RTW and Absenteeism **Follow-up**: 6, 12, 18 months
Description: PTCBWE: Physical Training with a cognitive behavioural component and Workplace specific Exercises: aimed at aim s to detect dysfunctional thinking habits and to change those thinking habits into a more realistic or functional way of thinking (in addition to the aims of the PT). **Providers**: Not mentioned	usual care: usual guidance by their general practitioner according to the guidelines of the Dutch College of General Practice for musculoskeletal disorders	**Primary outcome measure**: Claim duration (in days) the number of days the participant received work disability compensation between **Follow-up**: 6 & 12 months

Author, publication year, country	Sample; *N, sex* (% female), mean age (SD), (average) sick leave duration	Target population (average) sick leave duration	Intervention 1 General description Providers
Hellstrom et al. 2017, Denmark	**N**=326 **Sex**: 67.8% female **Mean age**: 35 years **Average sick leave duration**: not mentioned	People with a mood and anxiety disorder and not ready to return to work within 3 months after inclusion	**Description**: IPS modified for people with recently diagnosed mood or anxiety disorder: aimed at supporting people to obtain and sustain competitive employment through mentor support **Providers**: Mentors and career counselors
Huibers et al. 2004, The Netherlands	**N**=151 **Sex**: 55% female **Mean age**: 43.5 years **Average sick leave duration**: 12.3 years	People with severe fatigue and on with complete absenteeism from work for 6-26 weeks	**Description**: CBT: aimed at diminishing fatigue, establish work resumption and other personal goals and to establish self-perceived recovery **Providers**: General Practitioners
Lambeek et al. 2010, The Netherlands	**N**=134 **Sex**: 41.8% female **Mean age**: 46.2 years **Average sick leave duration**: not mentioned	People with low back pain for more than 12 weeks and were (partially) absent from work	**Description**: Integrated care: aimed at restore occupational functioning and achieve lasting return to work **Providers**: Clinical occupational physician, medical specialist, occupational therapist, physiotherapist
Li-Tsang et al. 2008, China	**N**=63 **Sex**: 38.1% female **Mean age**: 42.6 years **Average sick leave duration**: not mentioned	People with musculoskeletal injuries due to work with sick leave for over 7 months and have receive a training on work readiness program	**Description**: Job placement and support aimed at: of individual interviews, vocational counseling, job preparation and job seeking **Providers**: Case managers
Lytsy et al. 2017, Sweden	**N**=308 **Sex**: 100% female **Mean age**: 48.5 years (SD 6.3) **Average sick leave duration**: 7.5 years (SD 3.2)	Women with mental illness and/or pain syndromes who were on sick leave or time-restricted disability pension	**Description**: Multidisciplinary assessments and individual rehabilitation: aimed at assessing symptoms, disability and functioning from different perspectives **Providers**: Physician, psychologist, occupational therapist and social worker

Intervention 2 **General description** **Providers**	**Comparison**	**Primary outcome measure** **Follow-up**
Not applicable	Usual care: offered by job centers (e.g. mentor support)	**Primary outcome measure**: RTW: competitive employment or education at 24 months/ weeks until return to work **Follow-up**: 12 & 24 months
Not applicable	No treatment: free to visit GP for usual care	**Primary outcome measure**: Absenteeism: self-reported work resumption or absenteeism (yes/no) at each measurement, and absenteeism registered by the occupational health service (number of partial or complete sick days in 365 days). **Follow-up**: 4,8, 12 months
Not applicable	Usual care from their medical specialist, occupational physician, general practitioner, and/or allied health professionals.	**Primary outcome measure**: RTW; duration of sick leave until full return to work **Maximum duration of observation period:** 12 months
Not applicable	Usual care: self-placement group: referred to workers health center helping them to search jobs	**Primary outcome measure**: RTW; working continuously for 4 weeks for >18 hours per week **Follow-up**: 3 weeks
Description: ACT: form of CBT that uses acceptance and mindfulness strategies with behavioural strategies to increase function and quality of life **Providers**: psychologists	Usual care: provided by their regular health contacts	**Primary outcome measure**: RTW: measured with four different measures: returning to health insurance, number of reimbursed health insurance days, self-reported change in working hours, self-reported change in degree of engagement. **Follow-up**: 12 months

Author, publication year, country	Sample; *N, sex* (% female), mean age (SD), (average) sick leave duration	Target population (average) sick leave duration	Intervention 1 General description Providers
Magnussen et al. 2007, Norway	**N**=89 **Sex**: 65% female **Mean age**: 49 years **Average sick leave duration**: 10.69 years	People with back pain who receive full disability pension for more than one year	**Description**: Brief vocational-oriented intervention: aimed at lectures on spinal problems, motivational interviewing aimed at helping to focus on strength and capacity **Providers**: Counsellors from SSI or work office, physician, nurse
Marhold et al. 2001, Sweden (1 – short term)	**N**=36 **Sex**: 100% female **Mean age**: whole population: 46 years (SD 9) **Average sick leave duration**: 3 months	Women with neck-and shoulder pain or lower back pain on short-term (2-6 months) sick leave	**Description**: Cognitive behavioral return-to-work program aimed at focusing on skills needed to cope with pain and RTW **Provider**: Clinical psychologist
Marhold et al. 2001, Sweden (2 – long term)	**N**=36 **Sex**: 100% female **Mean age**: whole population: 46 years (SD 9) **Average sick leave duration**: 26 months	Women with neck-and shoulder pain or lower back pain on long-term (> 12 months) sick leave	**Description**: Cognitive behavioral return-to-work program aimed at focusing on skills needed to cope with pain and RTW **Provider**: Clinical psychologist
Myrhe et al. 2014, Norway	**N**=405 **Sex**: 46.4% female **Mean age**: 40.6 years **Average sick leave duration**: median 112 days	People with neck and back pain who were sick-listed between 4 weeks and 12 months and referred to an outpatient clinic	**Description**: Work-focused intervention + usual care: usual care and additional focus on RTW process **Providers**: physician, caseworker, physiotherapist
Nilsson & von Buxhoeveden 1996, Sweden	**N**=38 **Sex**: 68.4% female **Mean age**: 40.5 years **Average sick leave duration**: median 290 days	People with work-related locomotor symptoms on long-term sick leave for at least 6 weeks - 2 years	**Description**: Rehabilitation program existing out of occupational therapy and social counselling aimed at the pattern of sick leave absence and well-being versus pain and tension+ CAU **Providers**: occupational therapist, social worker, physiotherapist, a psychiatrist or other physicians

Intervention 2 **General description** **Providers**	**Comparison**	**Primary outcome measure** **Follow-up**
Not applicable	Control group: no further information	**Primary outcome measure**: RTW: being in a process of return to work defined as being on educational course or being in work training **Follow-up**: 12 months
Not applicable	Treatment as usual: no cognitive-behavioral interventions	**Primary outcome measure**: Number of days on sick leave **Follow-up**: 6 months
Not applicable	Treatment as usual: no cognitive-behavioral interventions	**Primary outcome measure**: Number of days on sick leave **Follow-up**: 6 months
Not applicable	Control intervention: either comprehensive multidisciplinary intervention or brief multidisciplinary intervention aimed at removing fear-avoidance beliefs, restoring activity level, and enhancing self-care and coping.	**Primary outcome measure**: RTW: first 5-week period to not receive a sickness benefits, a work assessment allowance pension, or a disability pension **Maximum duration of observation period:** 12 months
Not applicable	No treatment program	**Primary outcome measure**: RTW: back in work or training/ rate of RTW **Maximum duration of observation period:** 36 months

Author, publication year, country	Sample; *N, sex* (% female), mean age (SD), (average) sick leave duration	Target population (average) sick leave duration	Intervention 1 General description Providers
Park et al. 2018, Canada	**N**= 728 **Sex**: 36.8% female **Mean age**: 45 years (SD 12.2) **Average sick leave duration**: 233.7 (SD 688) days (disability duration)	People (non) job attached with musculoskeletal disorder injured at work	**Description**: Motivational interviewing in addition to a standard functional restoration program aimed at strengthening the clients own motivation for change **Providers**: Motivational interviewing practitioner
van der Feltz-Cornelis et al. 2010, The Netherlands	**N**=60 **Sex**: 58% female **Mean age**: 42 years **Average sick leave duration**: 144 days	People with depressive, anxiety or somatoform disorders with at least six weeks of absenteeism	**Description:** Psychiatric consultation aimed at delivering a diagnosis and treatment plan, including suggestions for RTW adapted to the specific needs of the patients due to their specific disorder. OP's were trained in doing this **Providers**: Occupational physicians, psychiatrists and general practitioners
van Egmond et al. 2016, The Netherlands	**N**=171 **Sex**: 69% female **Mean age**: 48.4 years **Average sick leave duration**: not mentioned	People with cancer, sick-listed, receiving sickness or disability benefits, without employment on sick leave for at least 12 months and maximum 36 months.	**Description:** The tailored RTW program: existing out of an introductory interview, a 'Preparation for RTW' part, and a 'RTW' part. Routes are tailored to the needs of the individual. + CAU **Providers:** re-integration coach, vocational therapists or personnel with background in HR,

General study characteristics

General characteristics of the studies are presented in table 3. Almost all studies had two arms (intervention and control) except for four studies with three arms (26, 30, 34, 36). The number of participants ranged from 38 (32) to 2238 (45). The mean sick leave duration ranged from 3 months (25) to 12.3 years (31). Most studies (n=12) included more women than men. Two studies (25, 36) only included women, all other studies included both men and women. The mean age ranged from 32.3 years (27) to 49.1 years (37). Studies were mostly executed in Northern Europe (n=16). Most common RTW outcome measures were RTW status, duration until RTW and claim duration. Only studies involving populations on sick-leave with a mean or median duration of more than 90 days were included, but within these studies the length of

Intervention 2 **General description** **Providers**	**Comparison**	**Primary outcome measure** **Follow-up**
Not applicable	Usual care: functional restoration program	**Primary outcome measure**: RTW: confirmed RTW status **Follow-up**: At time of program discharge
Not applicable	Care as usual: delivered by OP	**Primary outcome measure**: Time to RTW: Time to (lasting) RTW is defined as the period between the onset of sickness leave due to the mental disorder at hand and full RTW, for at least four weeks **Follow-up**: 3 & 6 months
Not applicable	CAU: The SSA's usual care generally consisted of a few meetings per year with an insurance physician, and potentially also a labor market or re-integration expert.	**Primary outcome measure:** Duration until sustainable (>28 days) RTW **Maximum duration of observation period:** 12 months

sick-leave varied considerably. Twenty-two interventions could be categorized based on the average or median sick leave duration of their sample or inclusion criterion. Nine studies concerned people with a sick leave duration with a median/mean of more than 3 months and less than one year. Twelve studies had a population on sick leave for 1 year or more (range: 12 months to 12.9 years). One study included both groups. Follow-up duration of the studies varied from "at program discharge" to 36 months. Eighteen interventions followed participants for at least 12 months (range 12 months-36 months).

Table 4: Intervention characteristics and elements

Study	Name of intervention	Sick leave duration before start intervention Mean (SD)	Characteristics • Psychosocial / physical / both • Individual / group / both • Multidisciplinary • Homework	Duration[1] (D) and Intensity[2] (I)
Berglund et al.	Multidisciplinary team	7.7 years	Psychosocial Individual Multidisciplinary No homework	D: Long I: NM
Blonk et al.	Combined intervention	NM	Psychosocial Individual Not multidisciplinary Homework	D: Short I: Moderate
Cheng	Workplace-based work hardening training	137.9 days (workdays lost since injury)	Physical Individual Not multidisciplinary No homework	D: Short I: High
Corey et al.	Functional restoration program	4.6 months (duration of disability)	Both Both Multidisciplinary No homework	D: Medium I: High
Della-Posta	CBT	39.4 weeks	Psychosocial Group NM No homework	D: Short I: High
Drake et al.	IPS+systematic medication management + behavioral health services	97.9 months on SSDI	Psychosocial + Medical Individual Multidisciplinary No homework	D: Long I: NM
Fleten et al.	Minimal intervention package	231.1 days	Psychosocial Individual Not multidisciplinary No homework	D: NA* I: NA*
Lambeek et al.	Integrated care (workplace intervention and graded activity)	NM	Both Both Multidisciplinary No homework	D: Medium I: Moderate
Li-Tsang et al.	Job placement and support	NM	Psychosocial Both Not multidisciplinary No homework	D: Short I: NM

Aim			Result[3]
Preparing to RTW • **Anamnesis** • **Formulating rehabilitation plan** • **Education** • **Counselling** • **CBT or ACT** • **Physical**	**Finding work** • **Teaching practical skills** • **Planning RTW** • **Placing in work** • **Helping find work**	**Remaining in work** • **Workplace specific exercises** • **Advising at workplace** • **Follow-up at workplace**	
Anamnesis Formulating rehabilitation plan Counselling	NA	NA	+
Education Counselling CBT or ACT	Planning RTW	NA	+
Education Physical	NA	Advising at workplace	+
Formulating rehabilitation plan Education CBT or ACT Physical	NA	NA	+
CBT or ACT	NA	NA	+
Anamnesis Counselling	Placed in work	Advising at workplace Follow-up at workplace	+
Anamnesis Education Counselling	NA	NA	+
Anamnesis Formulating rehabilitation plan Physical	NA	Advising at workplace	+
Anamnesis Formulating rehabilitation plan Counselling	Practical skills Searching for work	Advising at workplace	+

Study	Name of intervention	Sick leave duration before start intervention Mean (SD)	Characteristics • Psychosocial / physical / both • Individual / group / both • Multidisciplinary • Homework	Duration[1] (D) and Intensity[2] (I)
Park et al.	Motivational interviewing + functional restoration program=CAU	233.7 (SD 688) days (disability duration)	Both Individual Not multidisciplinary No homework	D: NM I: NM
Marhold	Cognitive behavioral return-to-work program	Short-term: 3 months Long-term: 26 months	Both Both Not multidisciplinary Homework	D: Medium I: High
Van der Feltz-Cornelis et al.	Psychiatric consultation program	144 days	Psychosocial Individual Multidisciplinary No homework	D: NM I: NM
Berglund et al.	ACT	7.7 years	Psychosocial Individual Not multidisciplinary No homework	D: Unclear I: Moderate
Blonk et al.	CBT	NM	Psychosocial Individual Not multidisciplinary Homework	D: Medium I: Moderate
Hees et al.	Occupational Therapy + TAU	median: 4.8 months	Psychosocial Both Not multidisciplinary No homework	D: Medium I: High
Heinrich	Physical Training with a Cognitive Behavioural component and Workplace specific Exercises	8.8 weeks (after 52 weeks waiting time)	Both Group NM No homework	D: Medium I: High
Hellstrom et al.	IPS-MA	NM	Psychosocial Individual Multidisciplinary No homework	D: NM I: NM
Huibers et al.	CBT	12.3 years	Psychosocial Individual Not multidisciplinary No homework	D: Medium I: Low

Aim			Result[3]
Preparing to RTW • **Anamnesis** • **Formulating rehabilitation plan** • **Education** • **Counselling** • **CBT or ACT** • **Physical**	**Finding work** • **Teaching practical skills** • **Planning RTW** • **Placing in work** • **Helping find work**	**Remaining in work** • **Workplace specific exercises** • **Advising at workplace** • **Follow-up at workplace**	
Formulating rehabilitation plan Counselling	NA	NA	+
Education Counselling ACT or CBT Physical	Placed in work	Physically at workplace Follow-up at workplace	Short-term sick leave (3 months): + Long-term sick leave (26 months): x
Formulating rehabilitation plan Counselling	Planning RTW	Advising at workplace	3 months: + 6 months: x
CBT or ACT	NA	NA	x
CBT or ACT	NA	NA	x
Anamnesis Formulating rehabilitation plan Counselling ACT or CBT	NA	Advising at workplace Follow-up at workplace	6 months: x 12 months: x 18 months: x
Anamnesis Formulating rehabilitation plan ACT or CBT Physical	NA	Advising at workplace	6 months: x 12 months: x
Formulating rehabilitation plan Counselling	Practical skills Searching for work	Advising at workplace	12 months: x 24 months: x
Anamnesis Formulating rehabilitation plan ACT or CBT	Planning RTW	NA	4 months: x 8 months; x 12 months: x

Study	Name of intervention	Sick leave duration before start intervention Mean (SD)	Characteristics • Psychosocial / physical / both • Individual / group / both • Multidisciplinary • Homework	Duration[1] (D) and Intensity[2] (I)
Lytsy et al.	Multidisciplinary assessments and individual rehabilitation	7.5 years (SD 3.2)	Both Individual Multidisciplinary No homework	D: Long I: High
	ACT	7.5 years (SD 3.2)	Psychosocial Individual Not multidisciplinary No homework	D: Long I: High
Magnussen	brief vocational-oriented intervention	10.69 years	Psychosocial Both Multidisciplinary No homework	D: Short I: Moderate
Myhre	Work-focussed intervention + CAU	median 112 days	Psychosocial Individual Multidisciplinary No homework	D: Short I: High
Nilsson	Occupational therapy and social counselling	median 290 days	Both NM Multidisciplinary No homework	D: Medium I: High
van Egmond	Tailored RTW program	NM	Both Individual Multidisciplinary No homework	D: Long I: Moderate
Heinrich	Physical training	8.8 weeks (after 52 weeks waiting time)	Physical Group Not multidisciplinary No homework	D: Medium I: High

Study results

Of the 25 different interventions, ten interventions were effective in improving the RTW outcome compared to usual care (table 3). Two interventions showed mixed results; one intervention (40) showed that compared to usual care the intervention (advice from the psychiatrist to the occupational physician about RTW) was only effective on return to work rates at three months (58% versus 44%), while at six months this difference had disappeared (~85% in both groups). Another intervention, a cognitive behavioural RTW-program (25) showed only to be effective for people with relatively short-term sick leave (mean 3 months) but not for people with a long-

Aim			**Result**[3]
Preparing to RTW • **Anamnesis** • **Formulating rehabilitation plan** • **Education** • **Counselling** • **CBT or ACT** • **Physical**	**Finding work** • **Teaching practical skills** • **Planning RTW** • **Placing in work** • **Helping find work**	**Remaining in work** • **Workplace specific exercises** • **Advising at workplace** • **Follow-up at workplace**	
Anamnesis Formulating rehabilitation plan Counselling ACT or CBT	NA	NA	x
ACT or CBT	NA	NA	x
Anamnesis Counselling	NA	NA	x
Anamnesis Formulating rehabilitation plan Education	NA	Advising at workplace	x
Anamnesis Formulating rehabilitation plan Counselling Physical	NA	Advising at workplace	x
Anamnesis Formulating rehabilitation plan Counselling Physical	Placed in work	Advising at workplace	x
Anamnesis Formulating rehabilitation plan Physical	NA	NA	6 months: - 12 months: x

term sick leave (mean 26 months). In addition, there was one study which reported a positive effect in favor of the usual care group at 6 months, compared to the group receiving physical therapy, but this effect was not present at 12 months (30).

Elements of interventions

Table 4 shows the characteristics and the elements of the interventions that were studied. Both effective and not effective studies varied widely in type of intervention. In general, studies examined the effect of psychosocial interventions, such as Cognitive Behavioral Therapy (CBT) (25, 30, 31, 34) and Acceptance and Commitment Therapy (ACT) (26, 36). There were no differences in type of intervention when comparing the effective to the not effective interventions. Most (n=15) of the interventions of which the duration was described (n=20), lasted between 1 and 6 months. Six of these interventions were effective. Many interventions (n=11, of which 3 effective) had a high intensity, meaning they contained 12 or more hours of vocational rehabilitation. A minority of interventions were solely group interventions (n=3, n=1 effective). Only a few (n=3 of which 1 was effective) contained homework assignments. There were no notable differences in duration, intensity and type of intervention between the effective and the not effective interventions.

All included interventions were aimed at preparing the worker to return to work. Nearly half of the interventions were also aimed at helping the worker find work (8 interventions) or remain in work (12 interventions). Six interventions included all three aims: preparing the worker to RTW, helping the worker find work and helping the worker remain in work. Of the six interventions that included all three aims, two were effective on RTW (42, 45), while the other four were not (25, 33, 40, 44). In the next paragraphs, the content of the interventions for each main aim is further described.

Main aim 1: Preparing the worker for return to work

Ten of the 25 interventions aimed at preparing the worker to return to work were effective on RTW compared to the usual care. The effective interventions all contained various types of activities that were aimed at preparing the worker to return to work: these often contained a form of counselling, coaching or motivational interviewing (n=6) or education (n=4), and often started with assessing the underlying problems for RTW of the worker (n=5). In general, studies that were aimed at preparing the worker for returning to work often included assessing the underlying problems for RTW of the worker (n=14) and formulating a rehabilitation plan aimed at RTW, which is often based on this assessment (n=11). This, however, was not necessarily an element in effective interventions. Only two interventions that were effective included both of these activities, while ten ineffective interventions included this combination of activities. The interventions that contained a psychological intervention based on CBT, ACT or cognitive restructuring (n=11) were often aimed at managing pain or being able to cope with problems. Only three of these interventions were effective. There was no clear difference in the content of the psychological interventions between effective and not

effective studies. The effective interventions that contained a physical aspect included (among others) graded activity (37, 41) and work hardening (27), but again, there was no clear difference in the content of effective and non-effective physical interventions.

Main aim 2: Helping the worker find work

Eight interventions included elements focused on helping the worker find work. Three of these interventions were effective to improve the RTW outcome compared to the usual care (the combined intervention of study (34) and studies (42, 45). The effective interventions contained planning returning to work with the worker (34), placing the worker in work (45) or teaching practical skills and helping the worker look for work (42). However, these elements were comparable to those of the ineffective interventions.

Main aim 3: Helping the worker remain in work

Twelve of the interventions included elements focused on helping the worker remain in the workplace, of which four were effective on the RTW outcome compared to the usual care (27, 41, 42, 45). These effective interventions existed of advising at the workplace (27, 41, 42) or advising on working circumstances at the workplace and a follow-up at the workplace (45). Other interventions that included advising at the workplace, however, were not effective (e.g. (32, 38)). Both interventions that included physical training at the workplace were not more effective than the usual care ((30) or workplace specific exercises (25)). Also, interventions including a follow-up (booster sessions or ongoing support if needed) at the workplace (e.g. (25)) were not effective. The interventions that were only effective on short-term RTW included physical therapy and following up at the workplace or advising at the workplace and following up at the workplace.

Discussion

We included 25 interventions that were tested in 21 studies. Ten interventions showed a positive effect on RTW compared to usual care, two interventions showed mixed results, one study showed an effect in favor of the usual care group at 6 months and no effect at 12 months. Twelve interventions were not effective. As for the main aims of the intervention, all effective interventions were aimed at helping the worker prepare to RTW, while one intervention had the additional aim to help the worker find work and two interventions were also aimed at helping the worker remain in work. Two interventions contained all three main aims. The elements analyzed in this study could not explain why some interventions were effective and others were not.

Comparison with other studies

The results show that VR interventions are sometimes more effective and often just as effective than usual care in helping people who have been on long-term sick leave (> 90 days) return to work. This review thus shows that effective interventions also exist for people on long-term sick leave. This is in agreement with earlier reviews, which showed that it is possible to influence return to work of people on long-term sick leave (8, 13). Earlier reviews (7, 8) also suggested that interventions offered to this group should be high intensive interventions. The identified interventions in our study were often high intensive in terms of contact hours and duration, and most were comprehensive by including multiple aims. However, we could not explain differences in effectiveness by differences in intensity, comprehensiveness or the multiple disciplines included. Additionally, the identified characteristics of the studies, such as duration of the intervention or who provided the intervention, could also not explain the differences in effectiveness of the interventions.

The elements that we found, are comparable to the elements that vocational rehabilitation professionals mentioned as crucial for VR interventions (46). Especially formulating a rehabilitation plan was often part of the effective interventions (5 interventions). But it was also an element in many not effective interventions (9 interventions). Another review (1) concluded that contact with the workplace and including multiple components, are elements of effective interventions. Our results show that these elements are indeed part of the effective interventions, but were often also a part of the not effective interventions. A qualitative review by Reed et al. (47) studied elements that help ensure that workers experience VR interventions as supportive and effective. These elements are also often included in the effective interventions identified in this review. Especially personalized services (n=4) and collaboration with the employing organization (n=4) are often included. However, Reed et al. also concluded that skills development, and sustainable and ongoing interventions is what workers find supportive and effective, while these elements were only scarcely part of the effective (and the not-effective) interventions included in this review. The perspective of an effective intervention of a worker might thus be different from the actual effectiveness of an intervention.

With this review we contributed to identifying which elements effective VR interventions entail. We could, however, not conclude which elements make a VR intervention effective (or ineffective) in helping people with a long-term sick leave return to work. This study shows that including multiple phases of helping a worker return to work does not mean the intervention will be effective. It is possible that other elements that were not identified in this review do make an intervention

effective. This could be due to the often minimal description of the interventions, which made it difficult to determine the elements. Often studies did not report on personal elements, such as motivation, illness perception and societal participation that do have a large influence on whether or not a person on (long-term) sick leave benefits from interventions and returns to work (48). Studies also often did not report on the context, such as the organization, in which the VR intervention was tested, while this can be of influence on the effectiveness of the intervention (49). It is also a possibility that the usual care offered in the studies with the not-effective studies were more elaborate than the usual care offered in the studies with the effective VR interventions. Due to the limited description of the usual care we could not determine if this was the case.

Strengths and limitations

The main strength of this systematic review is that it is specifically aimed at people with a longer duration of sick leave (> 90 days). It is often thought that VR interventions are not effective or less effective for people with a sick leave duration of more than 90 days. Another strength of this review is that we included populations with any disease type. This is in line with the assumptions of the ICF-model (50) and Gragnano (51), that factors that influence RTW are often the same for people with different diseases. A methodological strength of this study is that we conducted a very broad literature search which limited the chance that we missed important studies, by including a large variety of search terms related to “rehabilitation” and by searching in multiple databases. A limitation of this review is that the included studies often minimally described the intervention and the usual care and only few used a protocol, such as the TIDieR checklist (52), to describe the intervention. Because of this, we were often not able to retrieve all elements in detail and may have missed elements that were relevant, but not described. The included studies were also not always of a high quality, in fact 8 studies had a low quality, often due to a selection bias or weak data collection methods. Another limitation of this study is that only four of the 21 included articles obtained a high (strong) score in the quality assessment. This was mainly due to selection bias, participants that were not blinded for the condition they were allocated to and using self-reported questionnaires to measure return to work.

Implications for policy, practice and research

Based on the results of this review we first can conclude that people on long-term sick leave can return to work and that VR interventions can contribute to this. With this information, social security institutes and other organizations aimed at vocational rehabilitation have an evidence-base to offer VR interventions to people who have been on long-term sick leave or who receive a disability pension. Based on this

review we cannot give an overview of the elements of (effective) VR interventions. Future studies are needed to gain (more) knowledge about what elements make VR interventions effective in different settings for people with long-term sick leave. Only after research has shed more light on this, organizations which offer RTW support can focus on individual elements of interventions. This knowledge can be used in tools to provide VR professionals with evidence-based knowledge on effective VR interventions for people on long-term sick leave to ensure workers receive good VR. Our previous studies (48, 53) showed that a decision aid to identify barriers for RTW and to choose appropriate VR interventions can help in reducing practice variation among VR professionals. This review can improve the decision aid with evidence-based knowledge. Future research should investigate how this information can best be implemented in the decision aid. It is recommended that future studies improve the participation rate and use more reliable methods to measure the main outcome to improve the quality of these studies.

Conclusions

This study showed that VR interventions can contribute to the RTW of people with a long-term sick leave. But no specific characteristics or elements were found that could explain why an interventions was more effective on RTW than the offered usual care. There is still much to gain in understanding which characteristics or elements of VR interventions that are aimed at helping people with a long-term sick leave return to work are effective or not. More knowledge is needed on which elements constitute effective VR interventions for this group tailored to personal and contextual characteristics to facilitate a better perspective on RTW. In order to improve vocational rehabilitation for people on long-term sick leave or receiving a work disability pension, more high quality studies are needed, in which the study population and intervention content is better described in order to be able to identify what elements make the intervention effective for whom.

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Supplementary files

Supplementary file 1. Search strategy

Search History PubMed February 7, 2022

Search	Query	Items found
#5	(#1 OR #2) AND #3 AND #4	4,230
#4	"Clinical Trials as Topic"[Mesh] OR "Controlled Clinical Trials as Topic"[Mesh] OR "Controlled Clinical Trial" [Publication Type] OR "Random Allocation"[Mesh] OR ((random*[tiab] AND (controlled[tiab] OR control[tiab] OR versus[tiab] OR vs[tiab] OR group[tiab] OR groups[tiab] OR comparison[tiab] OR compared[tiab] OR arm[tiab] OR arms[tiab] OR crossover[tiab] OR cross-over[tiab]) AND (trial[tiab] OR study[tiab])))	1,372,398
#3	"Rehabilitation, Vocational"[Mesh] OR "Case Management"[Mesh] OR "Occupational Therapy"[Mesh] OR "Counseling"[Mesh] OR "Rehabilitation"[Mesh] OR intervention*[tiab] OR program*[tiab] OR "case manag*"[tiab] OR casemanag*[tiab] OR "occupational therap*"[tiab] OR counseling[tiab] OR counselling[tiab] OR rehabilitation[tiab] OR "absence management"[tiab] OR project*[tiab] OR plan[tiab] OR model[tiab]	4,932,675
#2	"Insurance, Disability"[Mesh] OR ((beneficiar*[tiab] OR pension*[tiab] OR claim*[tiab] OR compensation*[tiab] OR insurance*[tiab] OR security[tiab]) AND ("Disabled Persons"[Mesh] OR sickness[tiab] OR disabilit*[tiab] OR disabled[tiab] OR invalidit*[tiab] OR absente*[tiab] OR absence[tiab] OR illness[tiab]))	34,761
#1	"Absenteeism"[Mesh] OR "Sick Leave"[Mesh] OR "Return to Work"[Mesh] OR "rehabilitation, vocational"[Mesh] OR "Return to Work"[tiab] OR "work resumption"[tiab] OR "back to work"[tiab] OR "work disab*"[tiab] OR "work incapacit*"[tiab] OR "work incapabilit*"[tiab] OR "work capacit*"[tiab] OR "work capabilit*"[tiab] OR "work inhibition*"[tiab] OR "working incapacit*"[tiab] OR "working capacit*"[tiab] OR "medical leave*"[tiab] OR "sick leave*"[tiab] OR "disability leave*"[tiab] OR "absente*"[tiab] OR "work absen*"[tiab] OR "sickness absen*"[tiab] OR "disability absen*"[tiab] OR "sick day*"[tiab] OR "illness day*"[tiab] OR "sick listed"[tiab] OR "reintegration"[tiab] OR "reemployment"[tiab] OR "re-employment"[tiab] OR "job reentry"[tiab] OR "job re-entry"[tiab]	54,084

Search History Embase.com February 7, 2022

Search	Query	Items found
#6	#5 NOT 'conference abstract'/it	3,940
#5	(#1 OR #2) AND #3 AND #4	4,901
#4	'clinical trial (topic)'/exp OR 'controlled clinical trial (topic)'/exp OR 'randomization'/exp OR ((random*:ab,ti,kw AND (controlled:ab,ti,kw OR control:ab,ti,kw OR versus:ab,ti,kw OR vs:ab,ti,kw OR group:ab,ti,kw OR groups:ab,ti,kw OR comparison:ab,ti,kw OR compared:ab,ti,kw OR arm:ab,ti,kw OR arms:ab,ti,kw OR crossover:ab,ti,kw OR 'cross-over':ab,ti,kw) AND (trial:ab,ti,kw OR study:ab,ti,kw)))	1,435,337
#3	'vocational rehabilitation'/exp OR 'case management'/exp OR 'occupational therapy'/exp OR 'rehabilitation'/exp OR 'intervention study'/exp OR 'counseling'/exp OR intervention*:ab,ti,kw OR program*:ab,ti,kw OR 'case manag*':ab,ti,kw OR casemanag*:ab,ti,kw OR 'occupational therap*':ab,ti,kw OR counseling:ab,ti,kw OR counselling:ab,ti,kw OR rehabilitation:ab,ti,kw OR 'absence management':ab,ti,kw OR project*:ab,ti,kw OR plan:ab,ti,kw OR model:ab,ti,kw	6,485,130
#2	('insurance'/exp OR beneficiar*:ab,ti,kw OR pension*:ab,ti,kw OR claim*:ab,ti,kw OR compensation*:ab,ti,kw OR insurance*:ab,ti,kw OR security:ab,ti,kw) AND ('disabled person'/exp OR sickness:ab,ti,kw OR disabilit*:ab,ti,kw OR disabled:ab,ti,kw OR invalidit*:ab,ti,kw OR absente*:ab,ti,kw OR absence:ab,ti,kw OR illness:ab,ti,kw)	47,626
#1	'absenteeism'/exp OR 'medical leave'/exp OR 'return to work'/exp OR 'vocational rehabilitation'/exp OR 'work resumption'/exp OR 'return to work':ab,ti,kw OR 'back to work':ab,ti,kw OR 'work disab*':ab,ti,kw OR 'work incapacit*':ab,ti,kw OR 'work incapabilit*':ab,ti,kw OR 'work capacit*':ab,ti,kw OR 'work capabilit*':ab,ti,kw OR 'working incapacit*':ab,ti,kw OR 'working capacit*':ab,ti,kw OR 'medical leave*':ab,ti,kw OR 'sick leave*':ab,ti,kw OR 'disability leave*':ab,ti,kw OR absente*:ab,ti,kw OR 'work absen*':ab,ti,kw OR 'sickness absen*':ab,ti,kw OR 'sick day*':ab,ti,kw OR 'illness day*':ab,ti,kw OR 'sick listed':ab,ti,kw OR reintegration:ab,ti,kw OR reemployment:ab,ti,kw OR 're-employment':ab,ti,kw OR 'job reentry':ab,ti,kw OR 'job re-entry':ab,ti,kw	72,880

Search History APA PsycInfo (Ebsco) February 7, 2022

Search	Query	Items found
S5	(S1 OR S2) AND S3 AND S4	975
S4	(ZC "clinical trial") OR ((DE ("Clinical Trials" OR "Random Sampling") OR (TI (random*) OR AB (random*) OR KW (random*)) AND (TI (controlled OR control OR versus OR vs OR group OR groups OR comparison OR compared OR arm OR arms OR crossover OR “cross-over”) OR AB (controlled OR control OR versus OR vs OR group OR groups OR comparison OR compared OR arm OR arms OR crossover OR “cross-over”) OR KW (controlled OR control OR versus OR vs OR group OR groups OR comparison OR compared OR arm OR arms OR crossover OR “cross-over”)) AND (TI (trial OR study) OR AB (trial OR study) OR KW (trial OR study)))	152,384
S3	DE ("Vocational Rehabilitation" OR "Supported Employment" OR "Vocational Evaluation" OR "Work Adjustment Training" OR "Rehabilitation Counseling" OR "Occupational Guidance" OR "Employee Assistance Programs" OR "Counseling" OR "Case Management" OR “Occupational Therapy" OR "Rehabilitation" OR "Counseling" OR "Intervention" OR "Workplace Intervention") OR TI (intervention* OR program* OR “case manag*” OR casemanag* OR “occupational therap*” OR counseling OR counselling OR rehabilitation OR absence management OR project OR plan OR model) OR AB (intervention* OR program* OR “case manag*” OR casemanag* OR “occupational therap*” OR counseling OR counselling OR rehabilitation OR absence management OR project OR plan OR model) OR KW (intervention* OR program* OR “case manag*” OR casemanag* OR “occupational therap*” OR counseling OR counselling OR rehabilitation OR absence management OR project OR plan OR model)	1,577,072
S2	(DE ("Social Security" OR "Insurance" OR "Employee Leave Benefits") OR TI (beneficiar* OR pension* OR claim* OR compensation* OR insurance* OR security) OR AB (beneficiar* OR pension* OR claim* OR compensation* OR insurance* OR security) OR KW (beneficiar* OR pension* OR claim* OR compensation* OR insurance* OR security)) AND (DE ("Disabled Personnel" OR "Disabilities") OR TI (sickness OR disabilit* OR disabled OR invalidit* OR absente* OR absence OR illness) OR AB (sickness OR disabilit* OR disabled OR invalidit* OR absente* OR absence OR illness) OR KW (sickness OR disabilit* OR disabled OR invalidit* OR absente* OR absence OR illness))	13,537
S1	DE ("Employee Absenteeism" OR "Reemployment" OR "Vocational Rehabilitation") OR TI (“return to work” OR “back to work” OR “work disab*” OR “work incapacit*” OR “work incapabilit*” OR “work capacit*” OR “work capabilit*” OR “working incapacit*” OR “working capacit*” OR “medical leave*” OR “sick leave*” OR “disability leave*” OR absente* OR “work absen*” OR “sickness absen*” OR “sick day*” OR “illness day*” OR “sick listed” OR reintegration OR reemployment OR “re-employment” OR “job reentry” OR “job re-entry”) OR AB (“return to work” OR “back to work” OR “work disab*” OR “work incapacit*” OR “work incapabilit*” OR “work capacit*” OR “work capabilit*” OR “working incapacit*” OR “working capacit*” OR “medical leave*” OR “sick leave*” OR “disability leave*” OR absente* OR “work absen*” OR “sickness absen*” OR “sick day*” OR “illness day*” OR “sick listed” OR reintegration OR reemployment OR “re-employment” OR “job re-entry”)OR KW (“return to work” OR “back to work” OR “work* disab*” OR “work* incapacit*” OR “work* incapabilit*” OR “work* capacit*” OR “work* capabilit*” OR “medical leave*” OR “sick leave*” OR “disability leave*” OR absente* OR “work absen*” OR “sickness absen*” OR “sick day*” OR “illness day*” OR “sick listed” OR reintegration OR reemployment OR “re-employment” OR “job reentry” OR “job re-entry”)	21,656

Search History Cinahl (Ebsco) February 7, 2022

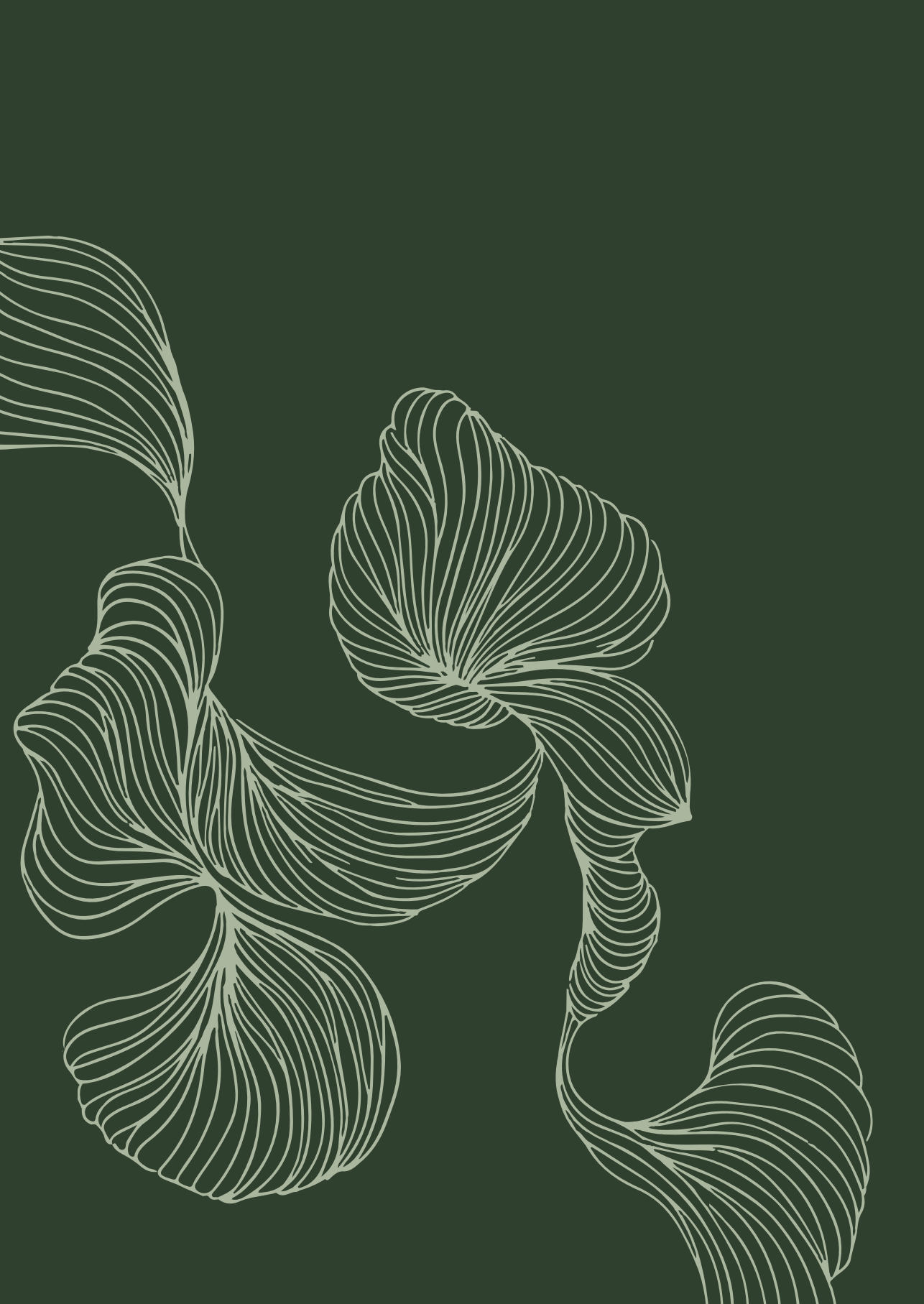
Search	Query	Items found
S5	(S1 OR S2) AND S3 AND S4	2,211
S4	(MH "Clinical Trials+" OR "Random Sample+") OR ((TI (random*) OR AB (random*)) AND (TI (controlled OR control OR versus OR vs OR group OR groups OR comparison OR compared OR arm OR arms OR crossover OR “cross-over”) OR AB (controlled OR control OR versus OR vs OR group OR groups OR comparison OR compared OR arm OR arms OR crossover OR “cross-over”)) AND (TI (trial OR study) OR AB (trial OR study)))	486,295
S3	MH ("Rehabilitation, Vocational+" OR "Rehabilitation+" OR "Case Management" OR "Occupational Therapy+" OR "Counseling+") OR TI (intervention* OR program* OR “case manag*” OR casemanag* OR “occupational therap*” OR counseling OR counselling OR rehabilitation OR absence management OR project OR plan OR model) OR AB (intervention* OR program* OR “case manag*” OR casemanag* OR “occupational therap*” OR counseling OR counselling OR rehabilitation OR absence management OR project OR plan OR model)	1,668,832
S2	((MH "Insurance+") OR TI (beneficiar* OR pension* OR claim* OR compensation* OR insurance* OR security) OR AB (beneficiar* OR pension* OR claim* OR compensation* OR insurance* OR security)) AND ((MH "Disabled") OR TI (sickness OR disabilit* OR disabled OR invalidit* OR absente* OR absence OR illness) OR AB (sickness OR disabilit* OR disabled OR invalidit* OR absente* OR absence OR illness))	14,894
S1	MH ("Job Re-Entry" OR "Absenteeism" OR "Vocational Guidance" OR "Sick Leave") OR TI (“return to work” OR “back to work” OR “work disab*” OR “work incapacit*” OR “work incapabilit*” OR “work capacit*” OR “work capabilit*” OR “working incapacit*” OR “working capacit*” OR “medical leave*” OR “sick leave*” OR “disability leave*” OR absente* OR “work absen*” OR “sickness absen*” OR “sick day*” OR “illness day*” OR “sick listed” OR reintegration OR reemployment OR “re-employment” OR “job reentry” OR “job re-entry”) OR AB (“return to work” OR “back to work” OR “work disab*” OR “work incapacit*” OR “work incapabilit*” OR “work capacit*” OR “work capabilit*” OR “working incapacit*” OR “working capacit*” OR “medical leave*” OR “sick leave*” OR “disability leave*” OR absente* OR “work absen*” OR “sickness absen*” OR “sick day*” OR “illness day*” OR “sick listed” OR reintegration OR reemployment OR “re-employment” OR “job reentry” OR “job re-entry”)	25,734

Search History Scopus February 7, 2022

Search	Query	Items found
#5	(#1 OR #2) AND #3 AND #4	7,498
#4	TITLE-ABS-KEY((random* AND (controlled OR control OR versus OR vs OR group OR groups OR comparison OR compared OR arm OR arms OR crossover OR “cross-over”) AND (trial OR study)))	1,594,275
#3	TITLE-ABS-KEY(intervention* OR program* OR “case manag*” OR casemanag* OR “occupational therap*” OR counseling OR counselling OR rehabilitation OR “absence management” OR project OR plan OR model)	19,494,564
#2	TITLE-ABS-KEY(beneficiar* OR pension* OR claim* OR compensation* OR insurance* OR security) AND (sickness OR disabilit* OR disabled OR invalidit* OR absente* OR absence OR illness)	135,717
#1	TITLE-ABS-KEY(“return to work” OR “back to work” OR “work* disab*” OR “work* incapacit*” OR “work* incapabilit*” OR “work* capacit*” OR “work* capabilit*” OR “medical leave*” OR “sick leave*” OR “disability leave*” OR absente* OR “work absen*” OR “sickness absen*” OR “sick day*” OR “illness day*” OR “sick listed” OR reintegration OR reemployment OR “re-employment” OR “job reentry” OR “job re-entry”)	85,780

Search History the Cochrane Library February 7, 2022

Search	Query	Items found
#5	(#1 OR #2) AND #3 AND #4	4886
#4	(random* AND (controlled OR control OR versus OR vs OR group OR groups OR comparison OR compared OR arm OR arms OR crossover OR "cross-over") AND (trial OR study)):ti,ab,kw (Word variations have been searched)	1,049,038
#3	(intervention* OR program* OR case NEXT manag* OR casemanag* OR occupational NEXT therap* OR counseling OR counselling OR rehabilitation OR "absence management" OR project OR plan OR model):ti,ab,kw (Word variations have been searched)	689,466
#2	((beneficiar* OR pension* OR claim* OR compensation* OR insurance* OR security) AND (sickness OR disabilit* OR disabled OR invalidit* OR absente* OR absence OR illness)):ti,ab,kw (Word variations have been searched)	3356
#1	("return-to-work" OR "back-to-work" OR work* NEXT disab* OR work* NEXT incapacit* OR work* NEXT incapabilit* OR work* NEXT capacit* OR work* NEXT capabilit* OR medical NEXT leave* OR sick NEXT leave* OR disability NEXT leave* OR absente* OR work NEXT absen* OR sickness NEXT absen* OR sick NEXT day* OR illness NEXT day* OR "sick listed" OR reintegration OR reemployment OR "re-employment" OR "job reentry" OR "job re-entry"):ti,ab,kw (Word variations have been searched)	5873



CHAPTER 4

Return to work factors and vocational rehabilitation interventions for long-term, partially disabled workers: a modified Delphi study among vocational rehabilitation professionals

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Abstract

Background: Long-term disability has a great impact on both society and workers with disabilities. Little is known about the barriers which prohibit workers with long-term disabilities from returning to work and which interventions are best suited to counteract these barriers. The main purpose of this study was to obtain consensus among professionals on important return to work (RTW) factors and effective vocational rehabilitation (VR) interventions for long-term (>2 years), partially disabled workers. Our three research questions were: (1) which factors are associated with RTW for long-term disabled workers?; (2) which factors associated with RTW can be targeted by VR interventions?; and (3) which VR interventions are the most effective to target these factors?

Methods: A modified Delphi Study was conducted using a panel of 22 labour experts, caseworkers, and insurance physicians. The study consisted of several rounds of questionnaires and one online meeting.

Results: The multidisciplinary panel reached consensus that 58 out of 67 factors were important for RTW and that 35 of these factors could be targeted using VR interventions. In five rounds, the expert panel reached consensus that 11 out of 22 VR interventions were effective for at least one of the eight most important RTW factors.

Conclusions: Consensus was reached among the expert panel that many factors that are important for the RTW of short-term disabled workers are also important for the RTW of long-term partially disabled workers and that a substantial number of these factors could effectively be targeted using VR interventions. The results of this study will be used to develop a decision aid that supports vocational rehabilitation professionals in profiling clients and in choosing suitable VR interventions.

Keywords: Decision aid, Disability pension, Labour experts, Insurance physicians, Long-term sick leave, Return to work

Background

Long-term work disability has many negative consequences for the lives of disabled workers. Not being able to return to work leads to economic and social deprivation [1] and reduced psychological well-being [2]. Workers who take long leaves of absence from work likewise have a lower chance of returning [1]. In the long run, only 20% of people who receive disability benefits for longer than six months will return to work (RTW) [1]. Such long-term absences not only influence the lives of the disabled workers, but also result in increased financial burden at a societal level. In 2019, 12.8 billion euros was spent on disability benefits in the Netherlands alone [3].

Thus, both individuals and society would benefit if partially disabled workers were able to return to work sooner. However, these workers often cannot return to work on their own. After two years of sick leave, workers in the Netherlands can apply for a disability benefit at the Dutch Social Security Institute (SSI). Workers who receive this benefit and who are still capable of earning part of their income receive help from the SSI with returning to work. At the SSI, labour experts and caseworkers try to support disabled workers in their RTW by referring them to vocational rehabilitation (VR) interventions [4]. To see which VR interventions are the best fit for a given disabled worker, labour experts and caseworkers consider the factors prohibiting the worker from returning to work and the factors which may promote their RTW. Currently, the assessments made by labour experts and caseworkers are not evidence-based, but rather practice-based due to insufficient scientific knowledge regarding factors that are barriers for RTW and VR interventions that are effective. This means that whether factors are seen as barriers, how these barriers are assessed, and which VR interventions are offered to a disabled worker, will vary between professionals (i.e., individual labour experts or caseworkers). Part of this variation cannot be explained and is unneeded and therefore undesirable variation, leading to offering not well-founded VR interventions.

To increase evidence-based knowledge on this topic and increase the effectivity of care delivered by labour experts, the development of evidence-based assessment tools and evidence-based VR interventions is needed. Whereas a number of studies have investigated which factors play a role in the RTW of workers after short-term sick leave [for example 5, 6], only one study could be found which examined the factors of importance for long-term (>2 years) disabled workers [7]. Scientific evidence is also limited regarding the VR interventions effective in facilitating RTW for long-term disabled workers. Several recent systematic reviews describe a variety of interventions for disabled workers [8, 9], but many of these interventions are not effective or have only proved to be effective for a specific patient group [8]. Interventions that are effective across patient groups are still missing.

There is a lack of scientific evidence on RTW for long-term disabled workers. A first step in developing an evidence base is collecting and combining practice-based knowledge from professionals with considerable expertise in this field.

This study aims to retrieve practice-based evidence, by reaching consensus among a multidisciplinary panel of labour experts, caseworkers, and insurance physicians on which factors influence RTW of long-term (>2 years) partially disabled workers and which VR interventions are effective in targeting these factors. We examined which factors and VR interventions are important for the RTW of long-term (>2 years), partially disabled workers. The three research questions of this study were: (1) which factors are associated with the RTW of long-term disabled workers?; (2) which factors associated with RTW can be targeted with VR interventions?; and (3) which VR interventions are most effective for targeting these factors?

Methods

Context:
In the Netherlands, people who have been on sick leave for two years can apply for a work disability pension at the Dutch Social Security Institute (SSI) based on the Act on Work and Income According to Work Capacity (WIA). People that receive a WIA-work disability pension and who still have (partial) work capacity are expected to earn a part of their income. To achieve this goal, these persons receive support from the SSI on returning to work. This support is offered by labour experts. In a face-to-face interview, the labour expert assesses the barriers that need to be addressed and the VR interventions that facilitate RTW for a specific person. Based on this interview, a rehabilitation plan is developed and the person with partial work capacity is referred to a matching rehabilitation provider to receive a VR intervention. The labour expert monitors the progress of RTW.

Study design

In this study, we used a stepwise modified Delphi technique [10] by combining the Delphi technique [11, 12] and the nominal group technique [13] to obtain multidisciplinary consensus from our expert panel. The panel consisted of labour experts, caseworkers, and insurance physicians. The Delphi consisted of several rounds using online questionnaires and an online meeting which employed the nominal group technique. The nominal group technique was used to structure the meeting to explore differences between individual labour experts and caseworkers in their opinion about RTW barriers and interventions and to reach consensus among the participants by group discussions [13]. Earlier studies have successfully used the combination of the Delphi technique and nominal group technique [14, 15].

At the start of the Delphi study, we formed a list of potential RTW factors and VR interventions by searching through scientific studies and semi-scientific (grey) literature on related populations and by speaking with professionals. We retrieved 58 RTW factors from semi-scientific studies [16, 17], scientific reviews [18, 19, 20, 21], and conversations with professionals working at the SSI. VR interventions were retrieved through an analysis of which interventions are currently offered to long-term disabled workers in the Netherlands. These were supplemented with VR interventions found in scientific [22–28] and semi-scientific [29] literature. To search for VR interventions within academic literature, we used the following definition: "a multi-professional evidence-based approach that is provided in different settings, services, and activities to working age individuals with health-related impairments, limitations, or restrictions with work functioning, and whose primary aim is to optimize work participation" [30].

Study population

Our panel of experts included people who had been working for at least one year as a labour expert, a caseworker, or an insurance physician with the RTW of long-term disabled workers at the Dutch SSI.

We recruited the panel of labour experts and caseworkers via a recruitment message distributed in the SSI's internal newsletter. Out of the responses to the recruitment message, we selected labour experts and caseworkers who were representative of different regions, ages, genders, and years of experience. In addition, we recruited insurance physicians with experience in the rehabilitation of long-term sick people via an email message.

Data collection and analysis

The Delphi study consisted of three sub-questions which experts answered over the course of five Delphi questionnaire rounds. An overview of these rounds and consensus rules can be found in Table 1.

Sub-questions

1. Factors associated with the RTW of long-term disabled workers (Rounds 1, 2, 3)

In the first question, experts were asked to indicate to what extent they agreed with the statement "This factor influences the RTW of long-term disabled workers". Experts could rate the extent of their agreement on a 5-point Likert scale. The response options were: (1) totally disagree, (2) disagree, (3) neutral, (4) agree, and (5) totally agree. Consensus was reached if ≥80% of the experts scored (4) agree or (5) totally agree for a particular factor. These factors were accepted without further discussion. If the consensus percentage was between ≥70% and <80%, the RTW factor had to

be scored again by the experts in the next questionnaire round. If the consensus percentage was lower than 70%, the factor was not considered to be important for the RTW of long-term disabled workers and was left out of the study. Experts also had the option of adding factors which they found to be important for the RTW of this group that were not on the list. These new factors were added to the second round, leaving out duplicates. In the second round, experts were once again asked to indicate to what extent they agreed with the newly added factors and the factors for which no consensus was reached in the previous round. Per factor, experts were provided with an overview of the number of participants that choose a specific response category for this question in the previous round and their own response. Afterward, the consensus percentage was calculated in the same way as in the first round. Factors for which the consensus percentage was between ≥70% and <80% after the second round were scored again in the third round.

2. Factors that can be targeted by VR interventions (Rounds 1, 2, 3)

In the second question, experts were asked to indicate if they thought that a factor could be targeted with an intervention aimed at returning to work. The response options were: (1) yes or (2) no. Consensus was established if ≥80% of the experts scored (1) yes or (2) no. These factors were accepted without further discussion. Factors that had a consensus percentage <70% were considered not to be targetable with VR interventions. As in the first question, if the consensus percentage was between ≥70% and <80% the RTW factor was scored again by the experts in the next questionnaire. In the second and third rounds, experts were provided with an overview of the number of participants that choose a specific response category for this question in the previous round and their own response. In the third round, the newly added factors for which there was no agreement reached in the second round were once more scored by the experts.

3. Effective VR interventions to target RTW factors (Rounds 4 and 5)

Finally, the factors which had been determined by consensus to be (a) associated with the RTW of long-term disabled workers and (b) that could be targeted by using VR interventions were once more presented to the experts in a fourth round. Experts were asked to indicate to what extent 22 clusters of VR interventions would be effective in targeting each of the factors. These clusters of VR interventions were collected in (academic) literature and in practice. Experts received a short description of the VR interventions and could indicate their answer on a 3-point Likert scale. The response options were: (1) not effective, (2) somewhat effective, and (3) very effective. After this round, the consensus percentages were calculated for each intervention on each factor. VR interventions for which ≥70% of the experts scored (3) very effective were

established to be targetable with RTW factors and were accepted without further discussion. VR interventions for which ≥50% and <70% of the experts had scored the intervention to be (3) very effective were once more presented to the experts to be scored in the next round. VR interventions for which <50% scored the intervention (3) very effective were excluded from subsequent Delphi rounds. The fifth round consisted of an online meeting and online questionnaire. Due to a combination of the large number of VR interventions for the factors for which consensus was not reached in the fourth round, the large number of potential interventions, and time constraints, only a selection of factors and their VR interventions could be discussed and scored again. We selected the 8 factors with the highest consensus percentage for the statement: "this factor is associated with RTW of long-term disabled workers", to reach consensus on the most effective VR interventions to target these factors for the VR interventions for which consensus was not yet reached.

The VR interventions for the other factors were not scored again in the fifth round. The results of the fourth round were thus the final results for the VR interventions of these RTW factors. RTW factors for which ≥70% of the experts scored (5) totally agree for the factor being important for RTW, and for which there was consensus that this factor could be influenced with a VR intervention (round 2) were taken to the fifth round. Participants received an overview of the percentage of participants that choose a certain response option in the previous round.

In the online meeting each factor was presented on the screen and with an online voting tool participants rated all VR interventions (for which no consensus had been reached in round four) on whether they were (1) not effective or (2) somewhat/very effective to target the factor. Then the results were discussed with all participants. The results of this discussion were incorporated into the final online questionnaire. Only half of the participants could attend this meeting. The other participants received the questions on paper.

In the final online questionnaire, all participants (including those not present during the online meeting) were asked to once again rate all VR interventions (for which no consensus had been reached in round four) on a dichotomous scale of whether or not they were effective to target each of the eight RTW factors. Consensus in this round was reached if ≥70% of the experts agreed that the intervention was (2) somewhat/very effective in targeting a particular factor. These VR interventions were accepted without further discussion.

Table 1: Overview of questions asked in each round

	Number of experts	1. Which factors are associated with the RTW of long-term disabled workers?	2. Which of these identified RTW factors can be targeted using VR interventions?	3. What are the most effective VR interventions to target these factors?
Round 1	21	Scoring 58 RTW factors retrieved from literature and practice on their association with RTW. Answer options were (1) totally disagree – (5) totally agree - ≥80% (4) agree or (5) totally agree → accepted - ≥70% - 80% (4) agree or (5) totally agree → consensus not reached and presented again in the next round - <70% (4) agree or (5) totally agree → left out of remaining rounds Option to add new relevant RTW factors	Scoring 58 RTW factors on whether they can be influenced by VR interventions. Answer options were (1) yes or (2) no - ≥80% (1) yes → accepted - ≥70% - 80% (1) yes → consensus not reached and presented again in the next round - <70% (1) yes → left out of remaining rounds	N/A
Round 2	20	Scoring RTW factors for which consensus was not reached in round 1 - ≥80% (4) agree or (5) totally agree → accepted - <80% (4) agree or (5) totally agree →left out of remaining rounds Scoring the newly added RTW factors in round 1 on their association with RTW - Same answering categories and consensus rules as in round 1	Scoring RTW factors for which consensus was not yet reached - ≥80% (1) yes → accepted - <80% (1) yes → left out of remaining rounds Scoring newly added RTW factors - Same answering categories and consensus rules as in round 1	N/A
Round 3	20	Scoring newly added factors for which consensus was not reached in round 2 - ≥80% (4) agree or (5) totally agree → accepted - <80% (4) agree or (5) totally agree →left out of remaining rounds	Scoring newly added factors for which consensus was not yet reached - ≥80% (1) yes → accepted - <80% (1) yes → left out of remaining rounds	N/A

	Number of experts	1. Which factors are associated with the RTW of long-term disabled workers?	2. Which of these identified RTW factors can be targeted using VR interventions?	3. What are the most effective VR interventions to target these factors?
Round 4	19	N/A	N/A	Scoring VR interventions for factors for which consensus was reached for questions 1 and 2. Answer options were (1) not effective, (2) somewhat effective, and (3) very effective - ≥70% (3) very effective → accepted - ≥50% and <70% (3) very effective → consensus not reached and presented again in the next round - <50% very effective→ left out of remaining round
Round 5	20	N/A	N/A	Due to time constraints, we limited the number of factors to be discussed. Therefore, for the fifth round we selected RTW factors for which ≥70% of the experts (5) totally agreed that the factor was important for RTW, and for which there was consensus that this factor could be influenced with a VR intervention (round 2). This resulted in a total of eight factors. For these factors VR interventions were scored for which consensus was not yet reached in round 4. Answer options were (1) not effective or (2) somewhat or very effective - ≥70% (2) somewhat or very effective → accepted - <70% → intervention is seen as ineffective in targeting a factor

Results

Expert panel

In total, 22 experts (ten labour experts, nine caseworkers, and three insurance physicians) agreed to participate in the Delphi study. Before the start of the first round, one participant withdrew from the study due to lack of time and a second participant withdrew from the study due to illness after the first round. One participant failed to fill out the questionnaire in the fourth round. See Table 1 for the number of experts per round.

Delphi rounds

1. *Which factors are associated with the RTW of long-term partially disabled workers? (Rounds 1, 2, 3)*

The results of round 1 found 80% of the experts to agree that 44 out of the 58 factors were indeed associated with the RTW of long-term disabled workers. Seven factors received a consensus percentage between 70-80% in the first round, six of which reached consensus in the second round. For eight factors, less than 70% of the experts agreed that the factor was associated with the RTW of long-term disabled workers. These factors were left out the Delphi after the first two rounds.

In the first round, the experts added 50 suggestions for additional factors. Based on these suggestions and after removing any duplicates, nine new factors were formulated. In round two, consensus was reached that five out of these nine new factors were associated with the RTW of long-term disabled workers. The four additional factors had an agreement percentage of between 70-80% and were once again presented to experts in the third round. In round three, consensus was reached for another three factors. After three rounds, the experts agreed that 58 out of the 67 factors were associated with the RTW of long-term partially disabled workers. An overview of the factors that were found to be associated with the RTW of long-term partially disabled workers can be found in Table 2. An overview of the consensus percentage per round can be found in Supplementary Material 1.

2. *Which of the identified RTW factors can be targeted using VR interventions? (Rounds 1, 2, 3)*

In the first round, consensus was reached (>80% of the experts) that 24 factors could be targeted using VR interventions. Seven factors scored between 70–80% and were scored again by experts in the second round. Consensus was then reached for six additional factors. In the second round, experts also scored the new nine factors which had been added and reached agreement for four out of the nine. (Round 3) A fifth new

factor scored between 70–80% and was thus scored again in the third round (where agreement on this factor was reached). In total, experts agreed that 35 out of the 67 RTW factors that were found in the search or added by the experts in the first round could be targeted using VR interventions. Table 2 shows the factors which could be targeted using a VR intervention according to the consensus reached. An overview of the consensus percentages per round can be found in Supplementary Material 2.

3. *What are the most effective VR interventions to target RTW factors? (Rounds 4 and 5)*

After the first three rounds, there was consensus among the experts that 35 factors (a) could be targeted in order to increase the chances of RTW for long-term disabled workers and (b) could be influenced with a VR intervention. Thirty-three of these factors were presented to the experts in the fourth round. Two factors, 'unemployment' and 'volunteer work', were left out of because they overlapped with the clusters of VR interventions. The experts were asked to indicate which VR interventions were effective in targeting each factor. After the fourth round, 26 effective VR interventions were found.

In the fifth and final Delphi round, the experts were asked to once more give their opinion on the effectiveness of the types of VR interventions for the selection of eight factors. These factors were selected based on that consensus was reached that they were important for the RTW (≥70% (5) totally agreed that the factor was important for RTW), and for which there was consensus that this factor could be targeted by using a VR intervention. For these eight factors, only the VR interventions for which consensus had not been reached in the fourth round were selected for the fifth round. The fifth round started with an online meeting in which experts (n=10) discussed their opinions on the topic. In the online questionnaire, experts (n=20) reached consensus for 30 VR interventions for the eight factors. In total (for all factors and including the VR interventions for which consensus was reached in round 4), the experts found 56 VR interventions to be effective. The experts agreed that multiple types of VR interventions could be effective per factor. For example, for the factor 'motivation' consensus was reached that eight types of VR intervention could be effective. Likewise, certain VR interventions were found to be effective for multiple RTW factors. For some factors, none of the proposed VR interventions were found to be effective. An overview of the VR interventions that could target RTW factors (according to the consensus) can be found in Table 2.

Table 2: Overview of important RTW factors and effective VR interventions according to our expert panel

Factors associated with RTW (>80%)	Factor that can be targeted using VR interventions (>80%)	VR interventions that are effective in targeting a factor (>70%)
Motivation to RTW[18]	yes	E (89%)[1], G (95%)[2], I (90%)[2], R (90%)[2], F (85%)[2], K (85%)[2], L (80%)[2], H (75%)[2]
Illness perception[b]	yes	G(72%)[1], H (95%)[2], I (95%)[2]
Societal participation[b]	yes	F (95%)[1], E (95%)[2], R (95%)[2], G (85%)[2], H (70%)[2]
Importance of work[18]	yes	F (90%)[2], G (90%)[2], R (90%)[2], K (85%)[2], E (85%)[2], L (70%)[2]
Family issues[b]	yes	D (74%)[1], H (85%)[2], G (80%)[2], U (70%)[2]
Financial problems[b,17]	yes	D (95%)[1]
History of substance abuse[b]	yes	None
Recent life events[a]	yes	H (90%)[2], D (85%)[2], T (80%)[2]
Job application skills[b]	yes	N (89%)[1]
Coping[b]	yes	H (100%)[2], G (90%)[2], E (85%)[2], I (85%)[2], T (80%)[2]
Job self-efficacy[16]	yes	G (72%)[1], I (72%)[1], L (72%)[1], R (72%)[1]
Fear avoidance behaviour[19]	yes	G (83%)[1]
Social network[16]	yes	F (84%)[1]
Willing to make concessions[16]	yes	None
Reintegration services already started in the past[a]	yes	None
Employee skills[17]	yes	J (83%)[1]
RTW self-efficacy[18]	yes	H (72%)[1], L (72%)[1], R (72%)[1]
Self-esteem[17]	yes	G (79%)[1]
RTW expectations[16, 18]	yes	None
Self-sufficiency[b]	yes	None
Quality of life[19]	yes	None
Unhealthy lifestyle[16]	yes	None
Caring for children[a]	yes	None
Experiences at old workplace[b]	yes	None
Unemployment[17]	yes	Not applicable
Perceived general health[16, 21]	yes	G (78%)[1], I (78%)[1], H (72%)[1]
Work-life balance[b]	yes	None
Sense of responsibility[b]	yes	None
Work ability [17, 18]	yes	None
Previously been in contact with the law	yes	None
Knowledge of the labour market[a]	yes	L (78%)[1]
Secondary gain of illness[a]	yes	E (79%)[1]
Job search behaviour[b]	yes	N (83%)[1], L (78%)[1]
Job search intensity[16]	yes	L (72%)[1], M (72%)[1]
Volunteer work[17]	yes	Not applicable

Factors associated with RTW (>80%)	Factor that can be targeted using VR interventions (>80%)	VR interventions that are effective in targeting a factor (>70%)
Understanding of the Dutch language[b]	no	
Language proficiency[b]	no	
Social support (outside of work)[18]	no	
Alcohol/Substance abuse[17]	no	
Secure housing[a]	no	
Compensation claim for personal injury[a]	no	
Diplomas[b]	no	
Main wage earner[17,21]	no	
Pain[19,20,21]	no	
Treatment[b]	no	
Income[21]	no	
Willingness to learn[b]	no	
Disability rate[b]	no	
Social norms regarding RTW[16]	no	
Transportation[b]	no	
Objection or appeal to decision for disability pension[b]	no	
Work history[b]	no	
Level of education[18]	no	
(Re-)training[b]	no	
Health transition[19]	no	
(Informal) Care[17]	no	
Age[16,18,20,21]	no	
Time since last working day[a]	no	

[a] Factor added based on suggestions by experts in round 1.
[b] Factor was retrieved from conversations with professionals.
[c] Factors were ranked based on 1) if they could be targeted with a VR intervention and 2) the percentage of consensus if a factor is associated with the RTW of a long-term disabled worker.
[1] Consensus was reached in round 4 VR interventions for which consensus was reached in round 4 are listed before VR interventions for which consensus was reached in the fifth round.
[2] Consensus was reached in round 5.
(A) Informing the disabled worker about the disability benefit or the re-integration process; (B) Professional (multidisciplinary) consultation to optimize the service offered to the disabled worker; (C) Assessing vocational needs; (D) Referral to services offered by other organizations; (E) Increasing motivation; (F) Improving societal participation; (G) Improving self-image and self-knowledge; (H) Increasing psychological resilience; (I) Improving vitality and physical resilience; (J) Strengthening employee skills; (K) Identifying what the disabled worker wants to do in terms of work; (L) Identifying what the disabled worker can do in terms of work; (M) Helping to search for vacancies; (N) Improving skills and helping with applying for a job; (O) Mediating; (P) Workplace adjustments or support; (Q) Training; (R) Increasing work experience; (S) Providing facilities; (T) Cognitive behavioural therapy; (U) Multidisciplinary interventions; (V) Individual Placement and Support (IPS). A description of the VR interventions can be found in Supplement 3. The VR interventions were assigned a letter based on the order in which we presented them to the participants during the Delphi.

Discussion

Main findings

The main aim of this Delphi study was to obtain multidisciplinary consensus among labour experts, caseworkers, and insurance physicians working at the Dutch SSI on which factors were relevant for the RTW of long-term (> 2 years) partially disabled workers and which VR interventions can be effective in improving RTW for this group. The factors were retrieved from literature reviews or practice. Among the experts, consensus was reached that 58 factors affect the RTW of long-term disabled workers. Furthermore, consensus was reached that 35 of these 58 factors could be targeted using a VR intervention. There was no consensus as to whether the other 23 factors could be influenced with a VR intervention because they were more or less fixed (for example, sex or age) or because a different types of intervention were needed (for example language proficiency). Finally, consensus was reached on what the most effective VR interventions were for the eight most important factors for RTW. For each of these factors, between one and eight interventions could be effective in increasing RTW according to the experts. Out of the 22 possible interventions, 11 interventions were effective for at least one of these eight factors.

Comparison with other studies

Factors

The 58 factors that were used in this Delphi study were based on the outcomes of reviews of relevant RTW factors for comparable populations and on conversations with professionals. Often these reviews described populations with a shorter sick leave (< 2 years) or populations for which the duration of the sick leave was not mentioned or was unclear. The results of this Delphi study indicate that experts in the field recognized the majority (51 out of 58) of these factors as also being relevant in the case of long-term (>2 years) disabled workers.

To our knowledge, there is only one other study that focused on RTW factors of long-term (>2 years) disabled workers. In that particular study, which was also a Delphi study, Dekkers-Sánchez and colleagues investigated the perspectives of insurance physicians on RTW factors that should be included in the work ability assessment of long-term disabled workers [7]. The factors that they found to be relevant were comparable with the results of this Delphi study. The factors ‘motivation’, ‘coping’, ‘secondary gain from illness’, and ‘illness perception’ were found to be important in both studies. The factors ‘positive attitude of employee towards RTW’ did not appear in our study exactly but overlapped with other factors that were included in our study such as: ‘motivation’ and ‘job search intensity’. Other factors included in the study by Dekkers-Sánchez were more aimed at

the process of RTW (e.g., providing RTW vocational rehabilitation as soon as possible or the assessment of cognition and behaviour) and were not included in the current study since our focus was not on the process of vocational rehabilitation.

Interventions

To inform this study, we collected VR interventions from literature reviews [22–28]. However, as discussed above, we did not find many studies that investigated which interventions were effective for workers who had been on long-term sick leave. We found four types of VR interventions that could be effective to help (long-term) disabled workers return to work: work-focused cognitive behavioural therapy (CBT) [24], motivational interviewing [23], multidisciplinary interventions [25, 26], and Individual Placement and Support (IPS) [27, 28].

From the literature it appears that IPS is effective for people with common mental disorders [27] or musculoskeletal complaints [28] to facilitate their RTW. However, the experts in our study did not recognize IPS as an effective intervention for any of the factors for the RTW of long-term disabled workers. The fact that our experts did not reach consensus on the effectiveness of IPS for any of the factors may stem from the fact that the Dutch SSI is currently only offering IPS to people with severe mental disorders. This may have led to these professionals having a limited view as to which target groups could potentially benefit from this intervention. The other three types of interventions included in the Delphi based on scientific evidence for their effectiveness (i.e., CBT, motivational interviewing, and multidisciplinary interventions) were found by the experts to be effective for some factors.

Interventions that focused on targeting psychological factors were deemed to be especially effective for many of the eight important factors for RTW. For example, “improving self-image and self-knowledge” and “increasing psychological resilience” were considered to be effective interventions for six of the factors. This shows that workers who have been out of work for a longer period are expected to benefit from interventions aimed at psychological factors.

Strengths and limitations

Whereas previous studies focused either on which factors were important for RTW or on VR interventions that were effective (primarily in workers with a certain disease), a strength of the present study is that it aimed to connect important RTW factors to effective VR interventions. A second strength of this study was the heterogeneity of the expert panel. The three most relevant professions involved in the rehabilitation of long-term disabled workers were included in the multidisciplinary panel. The inclusion

of multiple professions in this study served to establish a broader range of opinions and perspectives on the topic [31]. Another strength of this study was the high response rate on the questionnaires in the Delphi rounds. Only one of 21 participants dropped out after the first round, and only one of the remaining 20 participants missed a questionnaire round.

Unfortunately, the participation rate in the online consensus meeting was low: only half of the experts could join this meeting. This meant that half of the experts could not discuss their opinions on effective interventions with their peers. This may have led to greater difference in opinions on effective interventions between the experts that could join the meeting and the experts that could not join the meeting. However, we do not expect that this led to a bias, because no factors or interventions were selected or excluded during the meeting. Moreover, in the following questionnaire round all experts participated. Another limitation of this study might be that we did not include the long-term partially disabled workers themselves. An earlier study showed that there might be a difference in what employees, supervisors, and occupational physicians consider to be important RTW factors [32]. By not including disabled workers, we may have missed factors that are important to disabled workers for their own RTW. A final limitation is that, in the fifth round, only VR interventions for the eight most important (and influenceable) factors were presented to the experts to reach consensus. Only the VR interventions for these eight factors—which more than 70% of the experts found important for the RTW of long-term partially disabled workers—were presented. We did this to give experts the time to focus on the most important factors. However, this meant that participants could not score the effectiveness of the VR interventions for all factors for which consensus had not been reached. The results for the remaining factors would have been more accurate if they were also once more assessed by the participants in the fifth round. It could be possible that the consensus score (%) on the effectiveness of a VR intervention for a certain factor changes if it had been assessed once more.

Implications for practice and future research

Future studies could examine which combination or cluster of factors often present together in disabled workers. A study such as this would help to develop a typology of different types of disabled workers, which could in turn contribute to developing an instrument that supports professionals.

Now multidisciplinary consensus has been reached on which RTW factors are important for the RTW of long-term disabled workers and which VR interventions are effective for this population. With this, a first step has been made in gathering

evidence-based information for the development of an instrument that supports VR professionals. Such an instrument could support labour experts, caseworkers, insurance physicians, and vocational rehabilitation coaches in offering personalized VR interventions to long-term partially disabled workers. This instrument would also support professionals in assessing which RTW factors play a role in inhibiting a long-term partially disabled worker from returning to work. Likewise, it would support professionals in offering a VR intervention that targets the particular RTW factors that prohibit the worker from RTW. Finally, the instrument could improve the VR interventions received by the client by reducing practice variation in the care the client receives and improving personalized care. Additional studies, such as randomised controlled trials should verify if such an instrument is effective in facilitating the return to work of long-term disabled workers. Those studies should investigate whether such an instrument is more effective in helping long-term disabled workers return to work than usual care and whether the instrument is able to reduce practice variation among labour experts and caseworkers.

Conclusions

This Delphi study helped to reach multidisciplinary consensus on which RTW factors are important for the RTW of long-term disabled workers, as well as which factors could be influenced using a VR intervention. In this study, consensus was also reached on which VR interventions (found in academic literature and practice) are effective for this population. The study showed that most factors which are important for the RTW of shorter-term disabled workers are often also applicable for long-term disabled workers. This Delphi also added nine new expert-based factors which were not found in previous literature but which are applicable for this group.

With this information, an instrument can be developed that supports professionals in giving evidence-based personalized care to long-term disabled workers and that could help in reducing practice variation among professionals. The effectiveness of such an instrument in daily practice should be investigated.

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Supplementary material

Additional file 1: supplementary material

1. Associations of factors with RTW (consensus percentage per factor per round)

#	Factor	Round 1 (%)	Round 2 (%)	Round 3 (%)	End results
1	Motivation to RTW	**100%**			**100%**
2	Disease perception	**100%**			**100%**
3	Societal participation	**100%**			**100%**
4	Importance of work	**100%**			**100%**
5	Family issues	**100%**			**100%**
6	Financial problems	**100%**			**100%**
7	Understanding of the Dutch language	**100%**			**100%**
8	Language proficiency	**100%**			**100%**
9	Social support (outside of work)	**100%**			**100%**
10	Alcohol/substance abuse	**100%**			**100%**
11	Job application skills	**95%**			**95%**
12	Coping	**95%**			**95%**
13	Job self-efficacy	**95%**			**95%**
14	Fear avoidance behaviour	**95%**			**95%**
15	Social network	**95%**			**95%**
16	Willingness to make concessions	**95%**			**95%**
17	Diplomas	**90%**			**90%**
18	Employee skills	**90%**			**90%**
19	RTW self-efficacy	**90%**			**90%**
20	Self-esteem	**90%**			**90%**
21	RTW expectations	**90%**			**90%**
22	Self-sufficiency	**90%**			**90%**
23	Quality of life	**90%**			**90%**
24	Main wage earner	**90%**			**90%**
25	Pain	**90%**			**90%**
26	Treatment	**90%**			**90%**
27	Experiences at old workplace	**86%**			**86%**
28	Unemployment	**86%**			**86%**
29	Perceived general health	**86%**			**86%**
30	Income	**86%**			**86%**
31	Work-life balance	**86%**			**86%**
32	Sense of responsibility	**86%**			**86%**
33	Willingness to learn	**86%**			**86%**

#	Factor	Round 1 (%)	Round 2 (%)	Round 3 (%)	End results
34	Disability rate	**86%**			**86%**
35	Social norms regarding RTW	**86%**			**86%**
36	Transport	**86%**			**86%**
37	Objection or appeal to decision for disability pension	**86%**			**86%**
38	Job search behaviour	**81%**			**81%**
39	Job search intensity	**81%**			**81%**
40	Volunteer work	**81%**			**81%**
41	(Re-) training	**81%**			**81%**
42	Health transition	**81%**			**81%**
43	(Informal) Care	**81%**			**81%**
44	Age	**81%**			**81%**
45	History of substance abuse	76%	**100%**		**100%**
46	Unhealthy lifestyle	76%	**90%**		**90%**
47	Work ability	76%	**85%**		**85%**
48	Previously been in contact with the law	76%	**85%**		**85%**
49	Work history	76%	**85%**		**85%**
50	Educational level	71%	**85%**		**85%**
51	Type of disabilities	71%	70%		70%
52	Driver's license	67%			67%
53	Job search assistance	57%			57%
54	Complaint	57%			57%
55	Residential area	57%			57%
56	Legal assistance	43%			43%
57	Marital status	43%			43%
58	Sex	14%			14%
59	[a] Recent life events		**100%**		**100%**
60	[a] Housing		**95%**		**95%**
61	[a] Caring for children		**90%**		**90%**
62	[a] Knowledge of the labour market		**85%**		**85%**
63	[a] Time since last working day		**80%**		**80%**
64	[a] Reintegration services already started in the past		70%	**95%**	**95%**
65	[a] Secondary gain of illness		70%	**85%**	**85%**
66	[a] Personal injury		70%	**95%**	**95%**
67	[a] Dormant employment		45%		45%

Bold: consensus reached (>80% group consensus (4) agree and (5) totally agree)
[a] Additional item added by experts in first round

2. Factors that can be targeted by using VR interventions (consensus percentage per factor per round)

#	Factor	Round 1 (%)	Round 2 (%)	Round 3 (%)	End results
1	Job application skills	100%			**100%**
2	Coping	100%			**100%**
3	Employee skills	100%			**100%**
4	RTW self-efficacy	100%			**100%**
5	Self-esteem	100%			**100%**
6	Job search behaviour	100%			**100%**
7	Motivation to RTW	95%			**95%**
8	Disease perception	95%			**95%**
9	Societal participation	95%			**95%**
10	Job self-efficacy	95%			**95%**
11	Fear avoidance behaviour	95%			**95%**
12	RTW expectations	95%			**95%**
13	Job search intensity	95%			**95%**
14	Importance of work	90%			**90%**
15	Family issues	86%			**86%**
16	History of substance abuse	86%			**86%**
17	Willingness to make concessions	86%			**86%**
18	Quality of life	86%			**86%**
19	Unhealthy lifestyle	86%			**86%**
20	Experiences in the old workplace	86%			**86%**
21	Work-life balance	86%			**86%**
22	Work ability	86%			**86%**
23	Perceived general health	81%			**81%**
24	Sense of responsibility	81%			**81%**
25	Self-sufficiency	76%	**95%**		**95%**
26	Volunteer work	76%	**90%**		**90%**
27	Previously been in contact with the law	76%	**85%**		**85%**
28	Financial problems	76%	**80%**		**80%**
29	Unemployment	76%	**85%**		**85%**
30	Social network	71%	**95%**		**95%**
31	Main wage earner	71%	75%		75%
32	Pain	67%			67%
33	(Re-) training	67%			67%
34	Willingness to learn	62%			62%
35	Job search assistance	62%			62%
36	Understanding of the Dutch language	57%			57%

#	Factor	Round 1 (%)	Round 2 (%)	Round 3 (%)	End results
37	Diplomas	57%			57%
38	Health transition	57%			57%
39	(Informal) care	57%			57%
40	Language proficiency	52%			52%
41	Disability rate	52%			52%
42	Social support (not work)	48%			48%
43	Alcohol/substance abuse	48%			48%
44	Social norms regarding RTW	48%			48%
45	Type of disabilities	48%			48%
46	Transportation	43%			43%
47	Treatment	38%			38%
48	Work history	38%			38%
49	Complaint	38%			38%
50	Income	33%			33%
51	Educational level	29%	30%		30%
52	Driver's license	29%			29%
53	Objection or appeal to decision for disability pension	29%	20%		20%
54	Age	24%	20%		20%
55	Residential area	19%			19%
56	Legal assistance	10%			10%
57	Marital status	10%			10%
58	Sex	10%			10%
59	[a] Recent life events		**90%**		**90%**
60	[a] Caring for children		**90%**		**90%**
61	[a] Knowledge of the labour market		**90%**		**90%**
62	[a] Reintegration services already started in the past		**80%**		**80%**
63	[a] Secondary gain		70%	**80%**	**80%**
64	[a] Housing		65%		65%
65	[a] Dormant employment		60%		60%
66	[a] Time since last working day		55%		55%
67	[a] Personal injury		40%		40%

Bold: consensus reached (≥80% group consensus)
[a] Additional item added by experts in first round

3. Overview of interventions

a. Informing the disabled worker about the disability benefit or re-integration process

The labour expert or caseworker informs the disabled worker about the benefit, the Dutch SSI, or the reintegration process, or points the disabled worker towards information that can be found online.

b. Professional (multidisciplinary) consultation to optimize the service offered to the disabled worker

The labour expert or caseworker can request professional consultation in order to adequately substantiate and optimize the service to the claimant. The professional consultation is multidisciplinary.

c. Assessing Vocational Needs

The labour expert or caseworker can refer the disabled worker to a service in which complex problems are translated into factors that hinder the return to work and in which insight is gained into the competencies and possibilities of the disabled worker.

d. Referral to services offered by other organizations

The labour expert or caseworker can point out to the disabled worker the services of other organizations and initiatives if there are non-work-related problems that are not addressed in the reintegration process.

e. Increasing motivation

The labour expert or caseworker sends the disabled worker to an (online) intervention or trajectory that is aimed at increasing their motivation to resume work or use motivational interviewing.

f. Improving societal participation

The labour expert or caseworker uses certain techniques in the conversation or sends the disabled worker to an (online) intervention to allow the disabled worker to participate in structured activities in an organized context to improve their societal participation.

g. Improving self-image and self-knowledge

The labour expert or caseworker sends the disabled worker to an (online) intervention that is aimed at improving the worker's self-image and self-knowledge or works on this with the disabled worker directly. The intervention can be aimed at discovering

one's strengths and weaknesses, improving one's self-image, and processing barriers that stem from a low self-image.

h. Increasing psychological resilience

The labour expert or caseworker sends the disabled worker to an (online) intervention or process that is aimed at improving psychological resilience or works on this aspect with the disabled worker directly.

i. Improving vitality and physical resilience

The labour expert or caseworker sends the disabled worker to an (online) intervention or trajectory that is aimed at improving vitality and physical resilience or works on this aspect with the disabled worker directly.

j. Strengthening employee skills

The labour expert or caseworker sends the disabled worker to an (online) intervention or process that is aimed at strengthening employee skills or works on this in meetings with the disabled worker.

k. Identifying what the disabled worker wants to do in terms of work

The labour expert or caseworker sends the disabled worker to an (online) intervention or process that is aimed at identifying what the disabled worker wants in terms of work or helps the disabled worker identify this themselves.

l. Identifying what the disabled worker can do in terms of work

The labour expert or caseworker sends the disabled worker to an (online) intervention or process that is aimed at making an inventory of what the disabled worker can do in terms of work or helps the disabled worker to look for chances of finding their preferred profession in the regional labour market.

m. Helping to search for vacancies

The labour expert or caseworker sends the disabled worker to an (online) intervention or trajectory that is aimed at helping to search for vacancies or asks the disabled worker to work on this themselves.

n. Improving skills and helping with applying for a job

The labour expert or caseworker sends the disabled worker to an (online) intervention or trajectory that is aimed at helping with applying for a job or helps the disabled worker with this directly.

o. Mediating

The labour expert or caseworker mediates in finding a job or sends the disabled worker to an (online) intervention or process that mediates in finding a job.

p. Workplace adjustments or support

The labour expert or caseworker helps the worker with adjusting the job content, the workplace or working conditions or sends the disabled worker to an (online) intervention for this.

q. Training

The labour expert or caseworker can refer the disabled worker to training in order to acquire work and/or labour market relevant knowledge and/or skills.

r. Increasing work experience

The labour expert or caseworker can refer the disabled worker to a traineeship where a disabled worker can follow a (vocational) training course. A reintegration company assists the disabled worker.

s. Providing facilities

The labour expert or caseworker can request facilities, such as a job coach or a sign language interpreter, so that the disabled worker can resume work.

t. Cognitive behavioural therapy

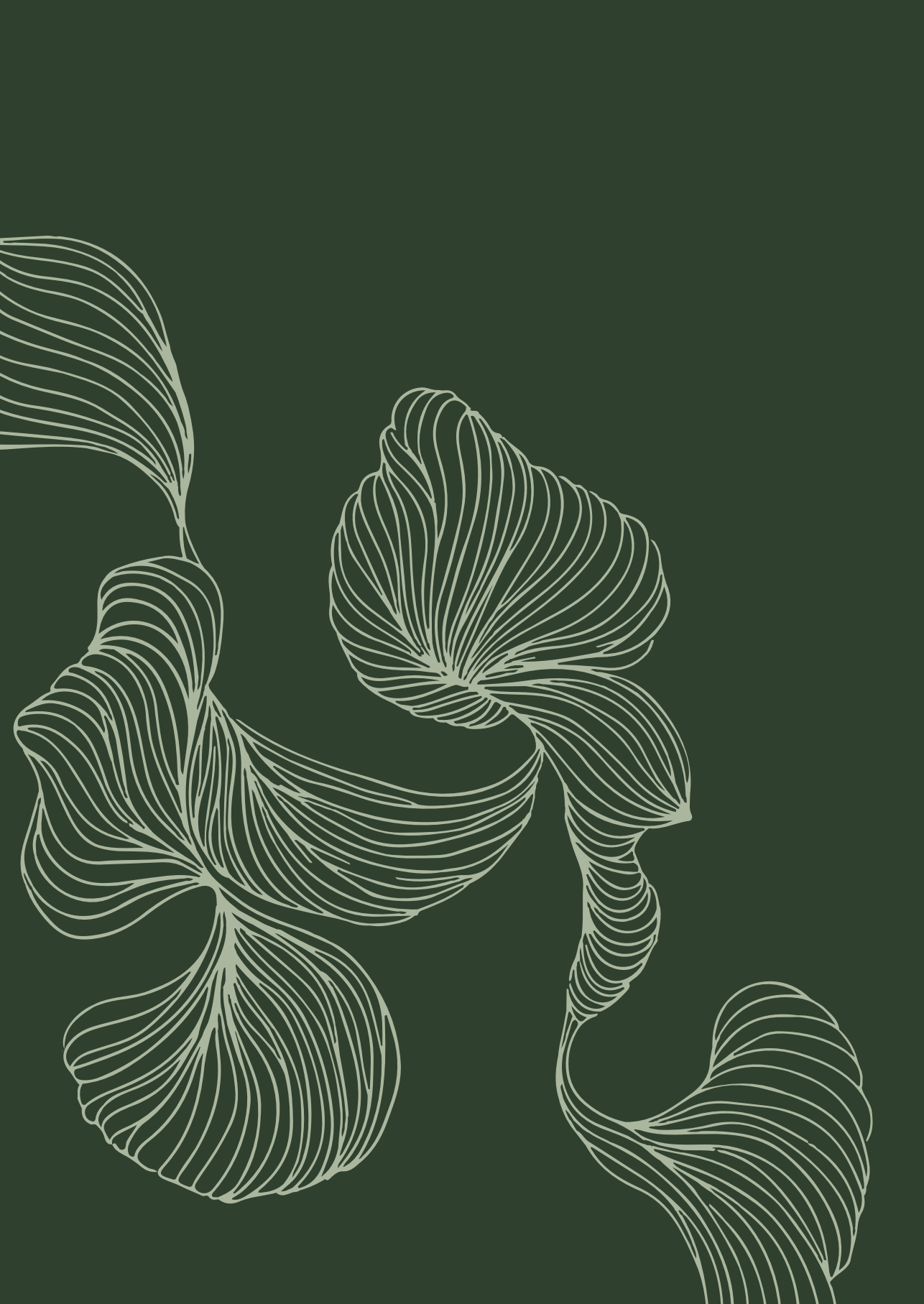
Cognitive behavioural therapy can be used to adjust unhelpful irrational thoughts, ie. thoughts that lead to dysfunctional behaviour, such as avoidance or aggression. An example of cognitive behavioural therapy is Acceptance and Commitment Therapy, which aims to increase functional abilities and quality of life instead of reducing complaints.

u. Multidisciplinary interventions

Multidisciplinary interventions are interventions that look at a person from multiple specializations. Each specialization assesses which possibilities and obstacles someone has in returning to work. Based on these assessments, a personalized reintegration plan is drawn up to get started.

v. Individual placement and support (IPS)

This intervention is aimed at placing people who are motivated to work in paid employment as soon as possible, whereby the person is (intensively) guided at the workplace by a job coach. This is the so-called first-place-then-train principle.



CHAPTER 5

A digital decision aid to support vocational rehabilitation professionals offering tailored care to work disability pension recipients: an experimental study using case vignettes

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Abstract

Purpose: In this experimental study we investigated whether the use of a decision aid during an assessment by a vocational rehabilitation (VR) professional results in an increased agreement with a gold standard of the most important return to work (RTW) barriers and most suitable VR interventions for work disability pension recipients and results in increased confidence of VR professionals in their assessment.

Methods: We conducted an experimental study with case vignettes among 23 VR professionals. We used a before-after design to compare whether the assessment of the most important RTW barriers and the most suitable VR interventions were in agreement with a gold standard with and without the use of a decision aid, in which the professionals were trained. Participants were also asked to state their confidence in their assessment of each case.

Results: Use of the decision aid significantly improved agreement with the gold standard both in identifying the most important RTW barriers and the most suitable VR interventions. However, use of the decision aid did not have a significant effect on the confidence of professionals.

Conclusions: A decision aid can be a promising tool for increasing the quality and conformity of assessments by VR professionals.

Keywords: decision aid; labour experts; VR professionals; RTW barriers; VR intervention.

Introduction

People who have been sick listed for a long period often do not return to work [1-3]. Next to receiving financial compensation to limit the loss of income, those who still have the capacity to work may receive interventions aimed at vocational rehabilitation to facilitate their return to work [4,5]. However, even people who receive help with vocational rehabilitation often do not return to work [1,3].

VR professionals are tasked with helping work disability pension recipients (partly) return to work but often experience difficulties to do so. VR interventions are most effective when aimed at specific and personalized RTW barriers [6]. However, it is difficult for VR professionals to assess these often complex situations and determine which intervention could be effective given that they have limited time for assessing their clients' situations [7] and that clients often have multiple problems that can inhibit them from returning to work. There is also a lack of evidence on which factors play the most important roles in RTW [8], as well as a lack of knowledge of which VR interventions are most effective for positively influencing these RTW factors [9]. There are currently only a few evidence-based tools that can support VR professionals in their assessments, such as the WHODAS 2.0 [10], the Work-ability Support Scale [11], and the Work Needs Assessment [12].

VR professionals could be supported in their assessments of important RTW barriers and suitable VR interventions by a decision aid. Decision aids are meant to complement the expertise, know-how, and experience of a professional by illustrating possible outcomes [13]. Earlier research has shown that decision aids and educational programmes can be effective at increasing the quality of health care [14], knowledge of guidelines and performance of occupational health professionals [15,16]. Earlier on, we developed a digital decision aid for VR professionals based on the results of a Delphi study [17]. In the Delphi study, experts determined which RTW barriers were most important for the vocational rehabilitation of disability pension recipients and which VR interventions were suitable for influencing these RTW barriers to facilitate return to work. The results were used to develop the decision aid for VR professionals supporting (partial) work disability pension recipients. The decision aid gives an overview of the RTW barriers and facilitators of work disability pension recipients and suggests suitable VR interventions. The aim of the decision aid is to increase evidence-based assessment and decrease variation in assessment among VR professionals. VR professionals received a training session on the use of the decision aid before using it.

The objective of the present study was to investigate whether the use of the digital decision aid by VR professionals resulted in increased agreement with a gold standard for most important RTW barriers and most suitable VR interventions for work disability pension recipients. We used increased agreement with the gold standard as a proxy for more customized and evidence-based services, and thus for more effective RTW support for people with a work disability. An additional objective was to investigate whether using the decision aid increased VR professionals' confidence in identifying the most important RTW barriers and the most suitable VR interventions to influence RTW barriers.

Methods

Study Design

An experimental study was conducted among 23 VR professionals. For this study, six pairs of matching textual case vignettes were developed based on real client records. The VR professionals completed two questionnaires concerning the case vignettes. In the baseline questionnaire, participants had to determine 1) the most important RTW barriers and 2) the most suitable VR interventions for the six case vignettes without the use of a decision aid (three case vignettes for assessing RTW barriers and three case vignettes for assessing suitable VR interventions). Participants were also asked about their confidence in their assessments. They then received a training session on the use of the decision aid. After the training session, participants received a follow-up questionnaire asking them to once again determine the most important RTW barriers and most suitable VR interventions for six matching case vignettes, this time with the use of the decision aid. Participants were also asked to again rate their confidence in their assessment.

The importance of RTW barriers and most suitable VR interventions were determined according to a gold standard we developed. The gold standard was developed based on consensus of three experts. We then determined the level of agreement between the answers of study participants and the gold standard. We also measured the differences in the confidence of the participant in their assessment with and without the decision aid.

Study Population

The study population consisted of non-medical VR professionals working at the Dutch SSI who were tasked with supporting partial work disability pension recipients in their vocational rehabilitation. VR professionals were invited to participate in this

study via the SSI's internal newsletter and selected using snowball sampling. People were eligible for participation in this study if they met the following criteria: non-medical VR professional employed at the Dutch SSI; at least six months of experience with supporting work disability pension recipients with remaining work capacity; and experience with face-to-face contact with disability pension recipients who were recently granted a work disability pension.

Participation in this study was voluntary. All participants signed an informed consent form and data were anonymized. This study was approved by the Medical Ethics Committee of Amsterdam UMC, VU University Medical Centre Amsterdam (2021.0406). The committee declared that no comprehensive ethical approval was needed for this study.

Decision Aid

The aim of the digital decision aid is to increase evidence-based work and the delivery of more tailored care among VR professionals by helping to 1) identify the most important RTW barriers and 2) determine the most suitable VR intervention(s) for a work disability pension recipient. The content of the decision aid was developed based on a Delphi Study [17] in which the most important RTW factors and suitable VR interventions were determined. The decision aid was developed in close collaboration with important stakeholders with experience with decision aids and with the vocational rehabilitation of work disability pension recipient. The result was a digital tool in Microsoft Excel for VR professionals, an overview of which can be found in table 1.

Table 1: contents of the decision aid

RTW factors	VR interventions
Work and finding work	
Job self-efficacy	1. Improving self-image and self-knowledge
	1. Improving vitality and physical resilience
	1. Identifying what the disabled worker can do in terms of work
	1. Increasing psychological resilience
	1. Increasing work experience
Job application skills	1. Improving skills and helping to apply for jobs
Job search behaviour	1. Improving skills and helping to apply for jobs
	2. Identifying what the disabled worker can do in terms of work
Knowledge of the labour market	1. Identifying what the disabled worker can do in terms of work
Willingness to make concessions	1. Informing the disabled worker about the disability benefit or the re-integration process
	1. Identifying what the disabled worker can do in terms of work
Diplomas	1. Training
Proficiency in Dutch language	1. Language course
Transportation	1. Facilitating transportation
Personal Factors	
Importance of work	1. Improving societal participation
	1. Improving self-image and self-knowledge
	1. Increasing work experience
	2. Increasing motivation
	2. Identifying what the disabled worker wants to do in terms of work
	3. Identifying what the disabled worker can do in terms of work
Motivation to RTW	1. Increasing motivation
	2. Improving self-image and self-knowledge
	3. Improving vitality and physical resilience
	3. Increasing work experience
	4. Improving societal participation
	4. Identifying what the disabled worker wants to do in terms of work
RTW expectations	1. Improving societal participation
	1. Improving self-image and self-knowledge
	2. Identifying what the disabled worker wants to do in terms of work
	2. Identifying what the disabled worker can do in terms of work
RTW self-efficacy	1. Improving self-image and self-knowledge
	1. Improving vitality and physical resilience

RTW factors	VR interventions
	1. Identifying what the disabled worker can do in terms of work
	1. Increasing psychological resilience
	1. Increasing work experience
Coping	1. Improving societal participation
	1. Increasing psychological resilience
	2. Improving self-image and self-knowledge
	3. Increasing motivation
	3. Improving vitality and physical resilience
	4. Cognitive behavioural therapy
Fear avoidance behaviour	1. Improving self-image and self-knowledge
Pain	1. Continuing VR interventions as much as possible
Self-esteem	1. Improving self-image and self-knowledge
	2. Increasing psychological resilience
Work functioning	
Work ability	1 Improving vitality and physical resilience
	1. Identifying what the disabled worker can do in terms of work
	1. Increasing work experience
	2. Improving societal participation
	2. Improving self-image and self-knowledge
	2. Increasing psychological resilience
Societal participation	1. Improving societal participation
	2. Increasing motivation
	2. Increasing work experience
	3. Improving self-image and self-knowledge
	3. Strengthening employee skills
Work-life balance	1. Improving self-image and self-knowledge
	2. Improving societal participation
Self-sufficiency	1. Improving societal participation
Employee skills	1. Strengthening employee skills
External factors	
Caring for children	1. Referral to services offered by other organizations
Family issues	1. Referral to services offered by other organizations
	2. Cognitive behavioural therapy
	3. Increasing psychological resilience
	4. Improving self-image and self-knowledge
	5. Multidisciplinary interventions
Recent life events	1. Increasing psychological resilience
	2. Referral to services offered by other organizations

RTW factors	VR interventions
	3. Cognitive behavioural therapy
Social network	1. Improving societal participation
Objection or appeal to decision for disability pension	1. Continuing VR interventions as much as possible
Secure housing	1. Referral to services offered by other organizations
Financial problems	1. Referral to services offered by other organizations
Treatment	1. Continuing VR interventions as much as possible
Alcohol / substance abuse	1. Referral to services offered by other organizations
	1. Explore feasibility of VR interventions
	1. RTW services specialized in substance abuse
Health	
Perceived general health	1. Improving self-image and self-knowledge
	1. Improving vitality and physical resilience
	2. Increasing psychological resilience
Quality of life	1. Improving self-image and self-knowledge
Unhealthy lifestyle	1. Improving vitality and physical resilience

The decision aid consists of a questionnaire that is filled in by the disability pension recipient to determine important RTW barriers and RTW facilitators. Based on answers in the questionnaire, the decision aid identifies which factors are RTW barriers and which factors are RTW facilitators using a traffic light code system. RTW barriers are shown as red factors, possible RTW barriers are shown as orange factors, and RTW facilitators are shown as green factors. The decision aid is used for structuring the VR professional's first meeting with a client. In this meeting, the VR professional discusses the RTW barriers from the questionnaire with the client. Together they choose the RTW barriers that will be targeted with one or more VR interventions. Based on the chosen RTW barriers, the decision aid suggests VR interventions tailored to these barriers. One VR intervention can often target several different RTW barriers. The decision aid ranks the suitable VR interventions based on 1) the extent to which the VR intervention is suitable to target a certain RTW barrier and 2) the number of RTW barriers the VR intervention targets. The VR professional discusses which VR interventions are most suitable with their client, and based on the outcomes of this meeting and the professional opinion of the VR professional, a tailored VR programme is developed consisting of one or more VR interventions. The VR programme is offered by a third party. The progress of the client is supervised by the VR professional from the SSI.

The decision aid training session introduced the VR professionals to the tool and demonstrated how the decision aid should be used in the daily practice. All training sessions were organized and conducted by at least two members of the research team. The training sessions were conducted online using Microsoft Teams, lasted two hours, and consisted of several elements. The sessions started by explaining how the decision aid had been developed and then explained the different elements and how to use the decision aid in practice. Thereafter, participants were given the opportunity to test the decision aid using examples of cases they had recently assessed. Finally, participants practiced using the decision aid with a case provided by the research team. The training sessions concluded with the participants reflecting on the use of the decision aid.

Case Vignettes

Case vignettes were developed in cooperation with three VR professionals with extensive experience in the vocational rehabilitation of work disability pension recipients. The case vignettes were based on types of clients that are typically seen in this target group. We made six pairs of case vignettes: three for determining barriers and three for determining interventions. A pair consisted of cases with similar barriers for RTW: physical or mental limitations, level of work disability and amount of pension, educational level, and work history. To prevent participants from recognizing a case and answering the questions the same way as without the decision aid, the cases presented varied characteristics (such as name, gender, living area, family circumstances, and hobbies) within each pair. Table 2 shows a summary of the twelve case vignettes and an example of a case vignette. The barriers were also varied among the cases in such a way that most of the barriers used in the decision aid were mentioned in the cases at least once. The pairs of cases were then divided so that one case vignette was in the baseline questionnaire and the other matching case vignette was in the follow-up questionnaire.

The vignettes included a short overview of the background information of the client: name, age, profession, level of education, work history, level of work disability, and pension and remaining earning capacity. The vignettes also included a short overview of the functional limitations that had been established by an insurance physician during the work disability assessment, followed by an overview of information on the daily living situation of the client. RTW barriers of the client in the case were mentioned in the text of the vignettes.

Table 2: overview of case vignettes

		General information: Sex, age, educational level, profession, work history	Percentage of work disability (%) prognosis	Gold standard
Factors				
Case pair 1: RTW barriers suggested by the decision aid: Likely RTW barriers: • Social support • Importance of work • Motivation to RTW • Work ability • Knowledge of the labour market • RTW expectations Possible RTW barriers: • Perceived general health • Coping	Without decision aid	• Man (age 57), • Primary school • Steel worker • Different functions in the steel industry	61% Symptoms will not improve	• Knowledge of the labour market • Importance of work • Motivation to RTW
	With decision aid	• Female (age 59) • Domestic school • Cleaning lady in elderly care • Cleaning lady in elderly care for the last 12 years, and before at other companies	59% Symptoms will not improve	• Knowledge of the labour market • Importance of work • Motivation
Case pair 2: RTW barriers suggested by the decision aid: Likely RTW barriers: • RTW expectations • Coping • Fear avoidance behaviour • Self-esteem • Work life balance • Willing to make concessions Possible RTW barriers: • Quality of life • Work ability	Without decision aid	• Male (age 34) • Law enforcement (bachelor's and master's degrees) • Criminal lawyer for 5 years	45% Not mentioned	• Self-esteem • Coping • Fear avoidance behaviour
	With decision aid	• Female (age 32) • Auditor, university post-master • Accountant • Accountant for 8 years at a large accountancy firm	41% Not mentioned	• Self-esteem • Coping • Fear avoidance behaviour

		General information: Sex, age, educational level, profession, work history	Percentage of work disability (%) prognosis	Gold standard
Case pair 3: RTW barriers suggested by the decision aid: Likely RTW barriers: • Unhealthy lifestyle • Family issues • Financial problems • RTW self-efficacy • Pain • Willingness to make concessions Possible RTW barriers: • Fear avoidance behaviour • Transportation	Without decision aid	• Female (age 38) • MBO 3 Allround Haarstylist • Hairdresser • Hairdresser for 18 years	65% Symptoms will not improve	• Willingness to make concessions • RTW self-efficacy • Unhealthy lifestyle
	With decision aid	• Male (age 40) • MBO 3 Allround Carpenter • Carpenter • Carpenter for 22 years in a small carpentry company	63% Symptoms will not improve	• Financial problems • RTW self-efficacy • Unhealthy lifestyle
Interventions				
Case pair 4: Suitable VR interventions suggested by the decision aid: • Increasing vitality and physical resilience • Increasing psychological resilience • Referral to services offered by other organizations • Cognitive behavioural therapy • Identifying what the disabled worker can do in terms of work • Increasing work experience • Improving societal participation	Without decision aid	• Male (age 38) • MBO 4 • Car technology • Mechanic • Car mechanic for 3 years at a BMW Previously worked as a (apprentice) mechanic at 2 other garages.	50% Symptoms will not improve	• Increasing psychological resilience • Increasing vitality and physical resilience • Identifying what the disabled worker can do in terms of work
	With decision aid	• Female (age 34) • MBO 3 • Nursing / care • Nurse / caregiver • For the last 5 years she was working in a nursing home. Before that she worked for 3 different employers within the healthcare sector.	47% Symptoms will not improve	• Increasing psychological resilience • Identifying what the disabled worker can do in terms of work • Increasing vitality and physical resilience

		General information: Sex, age, educational level, profession, work history	Percentage of work disability (%) prognosis	Gold standard
Case pair 5: Suitable VR interventions suggested by the decision aid: • Improving self-image and self-knowledge • Continuing VR interventions as much as possible Improving skills and helping with applying for a job • Identifying what the disabled worker can do in terms of work	Without decision aid	• Female (age 29) • Havo, HBO management and economy • Administrative assistant • Administrative assistant at a financial administration office for the last 7 years	39% Not mentioned	• Improving self-image and self-knowledge • Continuing RTW interventions as much as possible • Improving skills and helping with applying for a job • Identifying what the disabled worker can do in terms of work
	With decision aid	• Male (age 29) • HBO • Facility management • Facility manager at a school community for the last 5 years	37% Not mentioned	• Improving self-image and self-knowledge • Continuing RTW interventions as much as possible • Improving skills and helping with applying for a job • Identifying what the disabled worker can do in terms of work
Case pair 6: Suitable VR interventions suggested by the decision aid: • Increasing vitality and physical resilience • Increasing motivation • Improving self-image and self-knowledge • Increasing work experience • Improving societal participation • Identifying what the disabled worker wants to do in terms of work • Strengthening employee skills	Without decision aid	• Male (age 37) • HBO • ICT • IT specialist • Started as a junior IT specialist at an international company. Worked as a senior IT specialist at 2 employers in the same sector the past 6 years.	51.25% Not mentioned	• Improving societal participation • Improving self-image and self-knowledge • Increasing psychological resilience
	With decision aid	• Female (age 34) • HBO Human resource management • Recruiter • Worked as a recruiter in the industrial sector for 4 years. Previously worked as a recruiter at Randstad.	54.76% Not mentioned	• Improving self-image and self-knowledge • Improving societal participation • Increasing vitality and physical resilience

Baseline Questionnaire

The baseline questionnaire consisted of three sections. The participants first filled out a section with background information, including age, gender, work location, type of occupation, and years of experience with the vocational rehabilitation of this group. The second section focused on RTW factors. In this section, three case vignettes were shown. For each vignette, participants were asked—without the support of the decision aid—to indicate which factors were a barrier or were not a barrier for the RTW of the client. Participants also had the option of answering "cannot determine." Subsequently, participants were asked to indicate which three RTW barriers were the most important to target in a VR intervention. After each case vignette, participants were asked to indicate how confident they were in their assessment on a scale of 1–10. The third and last section focused on VR interventions. In this section, three other case vignettes were shown. For these case vignettes, the three most obstructing RTW barriers were given. Based on this information, participants were asked to assess if a type of VR intervention was appropriate or not for the worker in the case vignette. Participants also again had the option of answering "cannot determine." Participants were next asked which three types of VR intervention were most suitable for the client in the case vignette to target the specific RTW barriers of that client. Participants had the option to explain their answer in an open text field. Finally, after each case vignette, participants were asked to indicate their level of confidence with their assessment on a scale of 1–10.

Follow-up Questionnaire

After the training session, participants filled in a follow-up questionnaire consisting of the second and third sections of the baseline questionnaire. In the follow-up questionnaire, six new case vignettes with the outcomes of the decision aid (including the answers of the client on the questionnaire of the decision aid) were presented.

Outcomes

The primary outcome of this study was the difference in agreement with a gold standard on the most important RTW barriers and the most suitable VR interventions when using the decision aid compared to not using the decision aid. The secondary outcome of the study related to the confidence of professionals in their own assessment.

Primary outcome

To develop a gold standard for measuring the primary outcome, three experts were recruited: an experienced insurance physician (co-author: JRA) and two experienced VR professionals (SM and MH). These experts had previously been involved in the development of the decision aid. After being trained in the use of the decision aid, the experts scored the case vignettes independently. They then received the outcomes of

the decision aid for all case vignettes. In an online consensus meeting, the differences in scores were discussed for the cases in which agreement had not yet been reached. At the end of the online meeting, consensus was reached for which RTW barriers and which VR interventions were most important for each case vignette and thus part of the gold standard.

Subsequently, in the evaluation of study outcomes, participants were given one point for each RTW barrier or VR intervention they mentioned that was in agreement with the gold standard. For each case vignette, a participant could thus receive up to three points, for a total of nine points for determining the important RTW barriers and determining the most suitable VR interventions, as detailed below (Table 3). A higher score indicated greater agreement with the gold standard.

Table 3: Calculating points based on the gold standard

	Number of case vignettes	Maximum points per case vignette	Total maximum points
Baseline questionnaire (without decision aid, without training)			
Determining most important RTW barriers (Cases 1, 2, 3)	3	3	9
Determining most suitable VR interventions (Cases 4,5,6)	3	3	9
Follow-up questionnaire (with decision aid, with training)			
Determining most important RTW barriers (Matching Cases 1, 2, 3)	3	3	9
Determining most suitable VR interventions (Matching Cases 4, 5, 6)	3	3	9

Secondary Outcome

The secondary outcome of this study related to participants' confidence in their own assessments. This was measured with one question after each case vignette: "On a scale of 1 (very low) to 10 (very high) can you indicate how high your confidence is that you selected (a) the most important RTW barriers or (b) the most suitable VR interventions to increase the chances on work?" Participants' confidence for the case vignettes assessed with the decision aid was compared to their confidence for the case vignettes which were assessed without the decision aid.

Statistical Analysis

Descriptive statistics were used to report on the demographic and professional characteristics of the participants. We used linear mixed models (LMM) to test agreement with the gold standard without the use of the decision aid and with the

use of the decision aid. We first evaluated the efficacy of the use of a decision aid in determining the most important RTW barriers (Model 1) and then for determining the most suitable VR intervention (Model 2).

Linear mixed models were also used to evaluate the influence of the decision aid on the VR professionals' confidence in assessment.

In our models, use of the decision aid was added to the model as a fixed effect. The participant ID and number of the case vignette were specified as random effects. For both outcomes, we calculated the Wald confidence interval of the effect at the 95% level. We obtained the p-value of the main effects using the type-II ANOVA test implemented in the R package "car." In both analyses, we considered the significance level to be alpha=0.05.

Results

Twenty-three VR professionals participated in this study. Table 4 presents the demographic and professional characteristics of the participants. Most of the VR professionals were older than 45 years (69.5%) and the majority were female (83%).

Table 4: Demographic and professional characteristics of the participants

	N	%	Mean (SD)
Gender			
Male	4	17.4%	
Female	19	82.6%	
Age			48.8 (9.8)
<35	2	8.7%	
35–44	5	21.7%	
45–54	9	39.1%	
55+	7	30.4%	
Years of work experience with work disability pension recipients			7.9 (5.8) (1-23)

Practice Variation in Assessment with and without the use of the Decision Aid

For each case, the average agreement with the gold standard is given in Figure 1 (0=no agreement with gold standard, 3=maximum agreement with gold standard) and Table 5. For all case pairs, except case pair 6, the average agreement with the gold standard was higher for the case vignette evaluated using the decision aid compared to not using the decision aid.

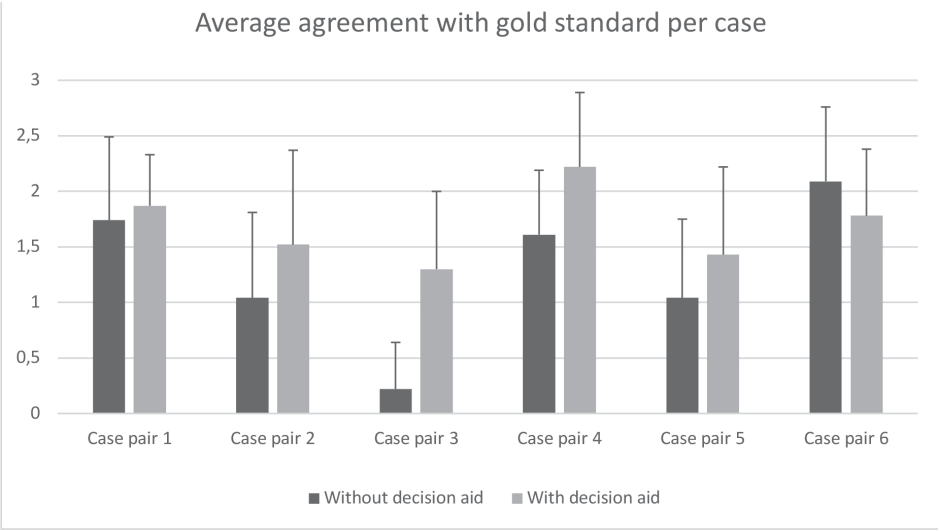

Figure 1: Average agreement with gold standard per case. For case pairs 1–3, participants determined the most important RTW barriers. For case pairs 4–6, participants determined the most suitable VR interventions.

Table 5: descriptive statistics for agreement with gold standard and confidence in assessment

	Agreement with gold standard		Confidence in assessment	
	Without decision aid Mean (SD)	**With decision aid Mean (SD)**	**Without decision aid Mean (SD)**	**With decision aid Mean (SD)**
Case pairs on return to work barriers				
Case pair 1	1.74 (0.75)	1.87 (0.46)	7.70 (0.88)	7.78 (0.95)
Case pair 2	1.04 (0.77)	1.52 (0.85)	7.39 (0.89)	7.91 (0.9)
Case pair 3	0.22 (0.42)	1.3 (0.70)	7.09 (1.20)	7.26 (1.05)
Average	1.00 (0.91)	1.57 (0.72)	7.39 (1.02)	7.65 (1.00)
Case pairs on vocational rehabilitation interventions				
Case pair 4	1.61 (0.58)	2.22 (0.67)	7.04 (1.02)	7.35 (0.94)
Case pair 5	1.04 (0.71)	1.43 (0.79)	7.13 (1.14)	7.22 (1.17)
Case pair 6	2.09 (0.67)	1.78 (0.6)	7.39 (0.99)	7.61 (0.89)
Average	1.58 (0.78)	1.81 (0.75)	7.19 (1.05)	7.39 (1.00)
Average of all cases	1.29 (0.89)	1.69 (0.74)	7.29 (1.03)	7.52 (1.01)

The use of the decision aid was significantly associated with a higher score on the gold standard for both determining the most important RTW barriers (Model 1, case pair 1–3, B=0.57, 95%CI (0.33-0.80)) and for determining the most suitable VR interventions (Model 2, case pair 4-6, B=0.23, 95%CI (0.01-0.45)). The results of the LMM analyses are summarized in Table 6.

Table 6: LMM models

	Model 1: Cases on determining important RTW barriers		Model 2: Cases on determining suitable RTW interventions	
	B (95% CI)	**p-value**	**B (95% CI)**	**p-value**
Agreement with gold standard	0.57 (0.33-0.80)	<0.001	0.23 (0.01-0.45)	0.039
Confidence in assessment	0.26 (-0.00-0.05)	0.052	0.20 (-0.01-0.42)	0.061

Confidence in Assessment with and without the Decision Aid

The confidence of VR professionals was higher for all cases with the use of the decision aid, but this increase in confidence was not significant (see Table 5). The average confidence ratings that VR professionals gave their own assessments with and without the use of the decision aid for each case are presented in Figure 2 and Table 5.

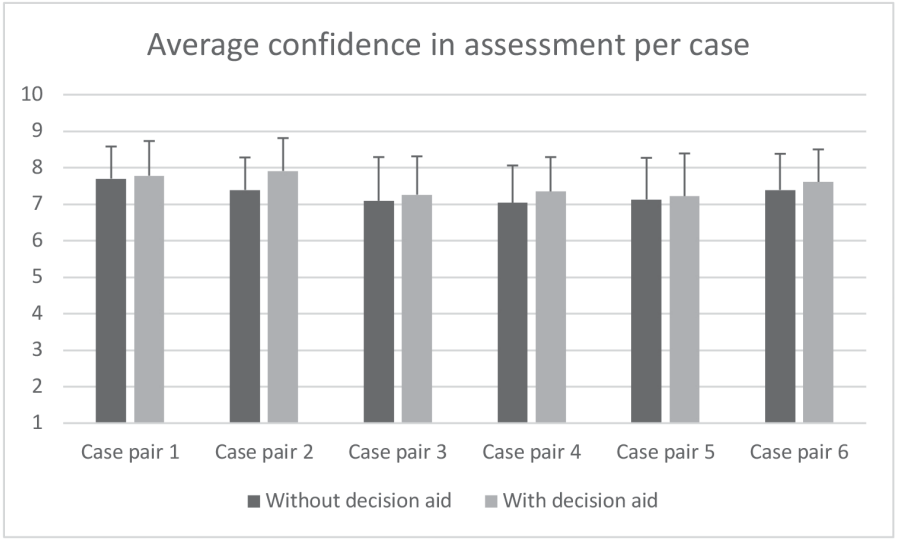

Figure 2: Average confidence in assessment per case.

The use of the decision aid was determined not to have a significant effect on the confidence of participants, neither in determining important RTW barriers (Model 1, case pair 1–3, (B=0.26, 95% CI (-0.00-0.05))) nor in determining the most suitable VR interventions (Model 2, case pair 4–6, (B=0.20, 95% CI (-0.01-0.42))) (Table 6).

Discussion

The aim of the present study was to investigate whether the use of a digital decision aid by VR professionals would result in increased agreement with a gold standard regarding the most important RTW barriers and the most suitable VR interventions for people receiving a work disability pension. We used increased agreement with the gold standard as a proxy for the delivery of more customized and evidence-based services. And thus, for better tailored and evidence-based support to increase their chances for acquiring paid employment despite having a work disability. This study showed that using the decision aid significantly increased agreement with the gold standard, which implies that using the decision aid helps VR professionals to be more evidence-based in their work and helps to reduce practice variation between VR professionals. Using the decision aid did not, however, increase the confidence of the VR professionals in their own assessments.

A previous study by Schouten et al. [12] showed that training in using a tool and actual use of a tool aimed at identifying work support needs, did indeed help to identify work support needs of clients, but did not improve the consistency of the professionals' assessment of suitable VR interventions, as we found in our study. This may have been due to the fact that the tool of Schouten et al. only helped to identify relevant RTW factors, but did not suggest relevant VR interventions as the decision aid did in the present study. In our decision aid these steps are both included and linked, which might explain the increased consistency we found between the professionals' assessment of suitable VR interventions. In addition, our study showed that when professionals are trained in using a tool and are prompted to actually use it, professionals seem inclined to incorporate the tool in their daily practice. This implies that a tool can contribute to the improvement of evidence-based practice among professionals. On the long-term, however, the effects are unclear. Studies showed that educational programmes can be effective in increasing knowledge of guidelines, guideline adherence, and performance (15,16), but also that these programmes are not always effective in increasing guideline adherence on the long-term (18,19). An earlier study in insurance medicine showed that a workshop did increase skills in evidence-based practice measured after three months, but did not increase knowledge on evidence-based practice after three months [18]. Adding a tool to the training, as we

did in the current study, might contribute to evidence-based working on the long-term, but additional research is needed to confirm this.

The significant overall effect of the decision aid on agreement with the gold standard for the RTW factors could be weighted by including case 3 in the analysis. The difference in average agreement with the gold standard with (M=1.3 (SD=0.70)) and without (M=0.22 (SD=0.42)) using the decision aid seemed to be especially large for this case. Therefore, we performed a sensitivity analysis by removing case 3 from the model. This indeed decreased the overall effect, but agreement with the gold standard was still significantly larger when using the decision aid (B=0.30 95%CI (0.01-0.60), p=0.04)).

Confidence in Assessment

The results of this study showed that using the decision aid did not increase VR professionals' confidence in their own assessments. Confidence was already quite high without the decision aid, which may have left little room for improvement. Yet, we do see a small improvement in the level of confidence, and thus it may also be possible that the number of participants was too small to detect an effect on this secondary outcome. Another explanation might be that the outcome of the decision aid was in line with their own thoughts. This possibility would be in line with the results of a similar study among insurance physicians, in which the researchers found that if the decision aid showed the same outcomes as the insurance physician's own assessment there was no significant change in confidence. In that study, only in cases where the decision aid showed a different outcome than the physician's own assessment was a significant decrease in confidence found [13].

Strengths and Limitations

In the present study, we tested the efficacy of using a decision aid using case vignettes on paper. Despite the limitation of case vignettes that professionals have to base their assessment on a relatively short description on paper and cannot ask questions or discuss factors with the client, as in real practice [12], the use of case vignettes in this study has several advantages. An important strength of using case vignettes on paper or video is that all VR professionals had the same information on each case. Earlier studies (e.g., [12]) used actors to play cases to simulate real practice. However, there can be a variation in the performances and reactions of actors, which can lead to a higher variation in assessment of the VR professional. Another advantage of using case vignettes is that no actual clients, who are already in a vulnerable position, needed to be burdened by being assessed by multiple VR professionals.

An additional strength of this study was that we included VR professionals from different offices of the Dutch SSI. Each office has their own work procedures and claimants' populations [13] and by including professionals from different offices we could test the efficacy of the decision aid for a wide variety of VR professionals with practice variation due to different work procedures and claimant's populations. A final strength is that we were able, due the research design, to test separately the efficacy of a decision aid on RTW factors and VR interventions. Earlier studies focussed on tools that only include RTW factors (e.g. 12), and therefore did not evaluate the efficacy on VR interventions to facilitate return to work.

One of the limitations of this study was the use of a gold standard based on consensus among experts. Due to a lack of professional guidelines, we could not base the gold standard on more objective data. We countered this limitation by asking three experts to participate, thus making sure the gold standard is inter-subjective [19]. Another limitation of this study is that we included 12 case vignettes to test our decision aid. Participants indicated that they had trouble with concentrating on this many cases. This may have led that the last cases were not as thoroughly assessed by the participants as the first cases. An additional limitation is that VR professionals participated voluntarily, which led to a potential selection bias. It is likely that the participants of our study are more interested in working according to a guideline and working with evidence-based tools.

Implications for Research and Practice

With this experimental study we showed that using a decision aid helps VR professionals work in ways that are more evidence-based and that reduce the practice variation. Our decision aid is, to our knowledge, the first tool that not only helps to identify relevant RTW barriers but also suggests suitable VR interventions. Although VR professionals recognize the value of evidence-based practice, studies show that there are many barriers to the use of evidence-based knowledge in daily practice [20]. These barriers can include weak administrative support, inadequate funding, too little time, lack of technical skills, and a lack of knowledge [20,21]. Therefore, a feasibility study should be done to test whether the use of this decision aid would be feasible practice and whether the decision aid would increase the quality of the VR services. Another important step would be to evaluate its effectiveness in real practice in a randomized controlled trial, to see whether using the decision aid would lead to greater agreement among VR professionals and to a greater rate of RTW success among disability pension recipients who received VR services.

Conclusions

The present study showed that using a digital decision aid increased the agreement of professionals with a gold standard when assessing the most important RTW barriers and the most suitable VR interventions. This implies that a decision aid can be an effective tool for increasing evidence-based practice and reducing practice variation among VR professionals. Future studies should test whether the use of such a decision aid would be feasible in real life practice and whether using the decision aid would indeed increase RTW success among disability pension recipients.

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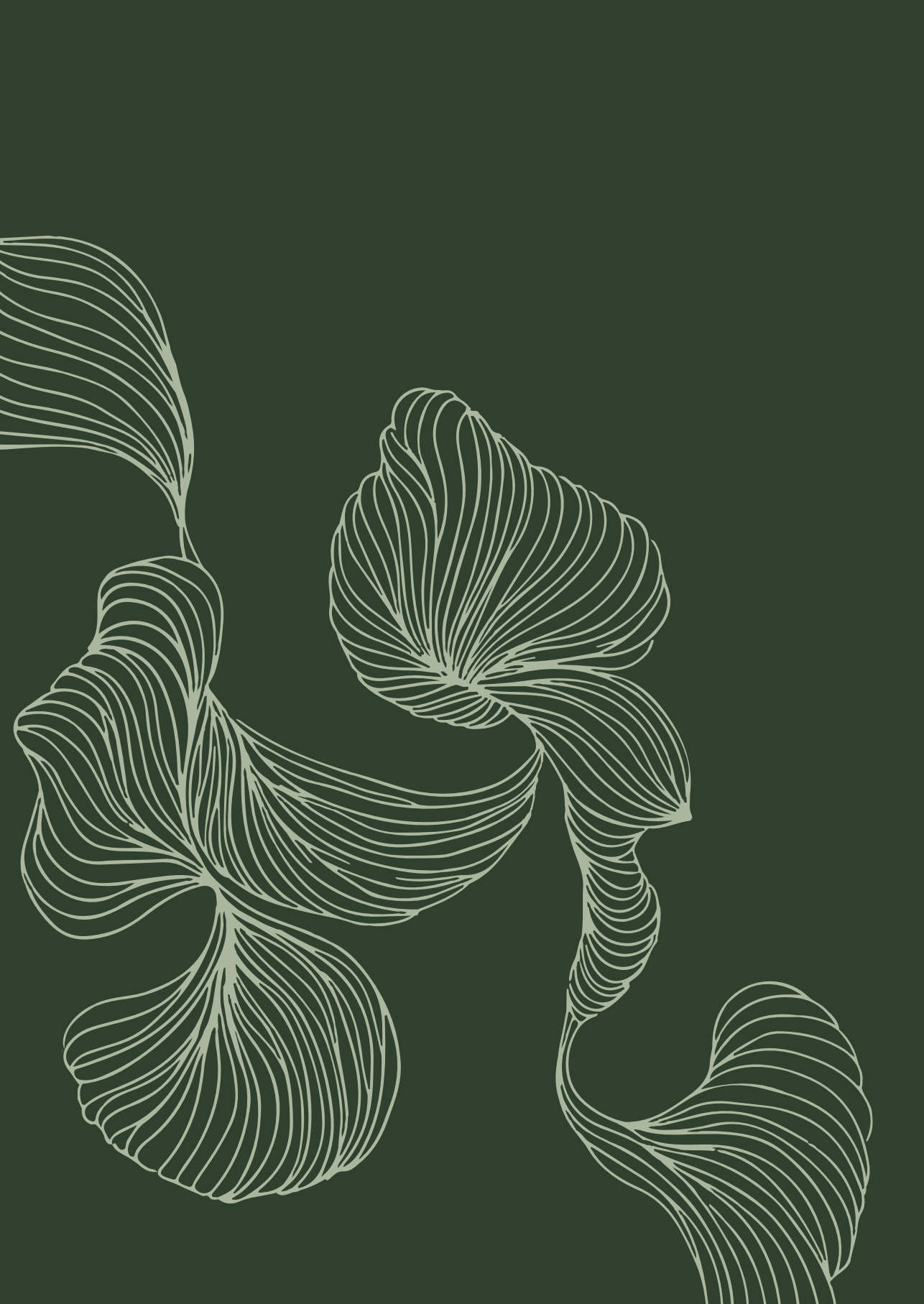

CHAPTER 6

A decision aid to support vocational rehabilitation professionals offering tailored care to benefit recipients with a long-term work disability: a feasibility study

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Abstract

Purpose: This feasibility study focusses on the implementation and use of a decision aid, which supports vocational rehabilitation (VR) professionals in helping clients with a disability pension return to work in practice. The decision aid shows an overview of the clients' return to work barriers and suggests suitable VR interventions based on these barriers.

Methods: The study population consisted of VR professionals working at the Dutch Social Security Institute and their clients receiving a (partial) work disability pension. The feasibility was measured with concepts of the Linnan and Steckler framework and the attitude, social norm and self-efficacy model. Data were collected using questionnaires, checklists and qualitative interviews.

Results: Ten professionals participated in this study. Fifty-four clients were asked to fill in the questionnaire of the decision aid and 32 clients received VR care based on the decision aid. In general, VR professionals and clients were satisfied with the decision aid and perceived a few barriers for using the decision aid.

Conclusions: This study showed that it is feasible to implement and use the decision aid. To improve the implementation of this decision aid, it should be implemented in digital systems used by professionals to improve efficiency of working with the decision aid.

Keywords: Return to work, long-term sick leave, vocational rehabilitation, decision aid, work disability pension

Introduction

Returning to work not only limits the loss of income, but being employed is also beneficial for (mental) health (1-3), quality of life (4), and well-being (5). Therefore, in many countries efforts are made to support people in returning to work. Many people receiving a partial work disability pension do not return to work (6-8). However, returning to work with a disability is far from easy, due to personal health, or external circumstances. To help people (partially) return to work, it is therefore important that they receive effective vocational rehabilitation (VR) interventions tailored to their situation. VR professionals however have limited time and resources for this (9).

To improve evidence-based working of VR professionals, several tools have been developed (e.g. (10-12). Despite these efforts, there is still a lack of standardized procedures, guidelines or tools to support VR professionals in identifying relevant RTW barriers and choosing effective VR interventions for work disability pension recipients. To support the quality of the assessment of important RTW barriers and to improve standardized procedures, we have developed a decision aid (13) based on the ICF-model (14). This decision aid supports in assessing RTW barriers and facilitators based on the clients' answers on a questionnaire, and in offering tailored VR care by suggesting relevant evidence-based VR interventions. Our earlier study showed that this decision aid was effective in increasing agreement with a gold standard (Chapter 5). This way, the decision aid improves evidence-based practice among VR professionals.

The present study describes the feasibility of using our decision aid by VR professionals in practice. Our main research aims were 1) to investigate to which extent the protocol steps of using the decision aid in practice were realized by VR professionals and their work disability pension recipients (clients); 2) to assess the barriers and facilitators for using the decision aid in practice; and 3) to assess the attitude of VR professionals and clients towards the decision aid.

Text block 1
In the Netherlands, workers on sick leave for at least two years can apply for a work disability benefit at the Dutch SSI. After two years, employers can terminate the contract of these people. An insurance physician conducts a medical disability assessment to evaluate if a work disability benefit is applicable. A labour expert then calculates the percentage of work disability (WIA WGA). If people have remaining work capacity or if an improvement in work capacity can be expected in the future, people receive help from the SSI with (partially) returning to work. A VR professional assesses the situation of the client and suggests one or multiple suitable VR interventions. The VR intervention is carried out by a third party. Progress is supervised by the VR professional of the Dutch SSI.

Methods

Study design

A feasibility study was performed between December 2021 and May 2022. Components of the Linnan & Steckler (15) framework and determinants of behavior by using the attitude, social norm and self-efficacy model (ASE model), derived from the Theory of Planned Behaviour (16) were collected using semi-structured interviews, checklists and questionnaires. VR professionals of the Dutch Social Security Institute (SSI) were recruited to participate in this study**.** Both occupational rehabilitation officers and labour experts could participate. Types of education of the VR professionals vary. Compared to occupational rehabilitation officers, labour experts have an additional one-year specialization as a labour expert**.** Participating professionals were asked to use the decision aid in the VR assessment of circa five clients receiving a work disability pension. The VR professionals were trained (June- September 2021) in a previous experimental study (Chapter 5) in the use of the decision aid. Before the start of the feasibility study, VR professionals were visited by the researchers (November-December 2021) to further train them in using the decision aid in practice. Data were collected on several moments (shown in text block 2) from both professionals and clients, using questionnaires, a checklist and interviews.. An overview of the interview guides can be found in Appendix 1.

Text block 2: Data collection

1. At the start of the training session VR professionals filled in a questionnaire to retrieve their characteristics.
2. Immediately after the training session, VR professionals filled in a questionnaire to evaluate the training session.
3. After each client that was asked to fill in the questionnaire, the VR professionals filled in a checklist to measure reach and dosage.
4. After including their last client, VR professionals filled in an evaluative questionnaire to measure the level of satisfaction, barriers and facilitators for using the decision aid, attitude, self-efficacy, intention for future use, and knowledge and skills with regard to the decision aid.
5. After clients had received a VR assessment with the decision aid, VR professionals asked clients to participate in an interview with the researchers about their experiences. and satisfaction with filling in the questionnaire for the decision aid and with the VR assessment they received.
6. After VR professionals included their last client and completed the evaluative questionnaire, VR professionals were asked to participate in an interview to gain in-depth knowledge on their level of satisfaction and experience, attitude, intention for future use, knowledge and skills, self-efficacy and potential barriers and facilitators.

This study was approved by the Medical Ethics Committee of Amsterdam UMC, VU University Medical Centre Amsterdam (2021.0406). The committee declared that no comprehensive ethical approval was needed. All participants signed informed consent before participation.

Study population

VR professionals

VR professionals were eligible for this study if they (1) were employed at the Dutch SSI, (2) had at least 6 months experience with the vocational rehabilitation of clients receiving a work disability pension, (3) conducted VR assessments with these clients, and (4) participated in the experimental study. in which they were trained to use the decision aid.

Clients

Clients were eligible to participate in this study if they received a work disability pension (WIA WGA) and were appointed to a VR professional that participated in the study. Clients were recruited for the interviews with help of the VR professionals. VR professionals informed clients about the opportunity to participate in an interview on a voluntary basis. To indicate their willingness to participate in the interview, clients could fill in the informed consent and send it to the researchers, or give consent to the VR professional to distribute their name and telephone number to the researchers. If more clients than needed indicated they wanted to participate in the interview, purposive sampling was used to select clients spread across the participating VR professionals. We included clients for interviews until data saturation was reached (17).

Intervention: Decision Aid

The decision aid was based on the ICF-model (14) and the results of a previous Delphi Study (13). The aim of the decision aid was to support VR professionals in delivering tailored care to improve return to work of work disability pension recipients with remaining work capacity. The decision aid supports in identifying potential RTW barriers of the client and suggests relevant directions for VR interventions to target these barriers. The VR trajectories offered at the Dutch SSI and the VR intervention directions in the decision aid differ, as described in text block 3.

Text block 3
At the Dutch SSI the VR interventions are grouped together in overarching VR trajectories. The intervention directions in the decision aid are not fully linked to these overarching trajectories because available interventions differ per SSI office. Therefore, the VR directions suggested by the decision aid are aimed at targeting a certain barrier and are more generally formulated than the VR trajectories used in practice. In this study, VR professionals can choose one of the overarching VR trajectories of the SSI themselves and use the decision aid to describe which specific VR directions for interventions, based on availability within the district, should be offered to the client.

The decision aid consists of five protocol steps, which are presented in table 1. For this study, VR professionals sent the questionnaire to the client either by post or by using the SSI's digital environment. After the questionnaire was filled in and returned, the VR professionals had to fill in the answers of the client in the decision aid. For feasibility of this study, the decision aid was built in Microsoft Excel.

Table 1: Protocol steps of using the decision aid by professional

1. Questionnaire
- Ask the client by telephone to fill in questionnaire
- Send questionnaire and information to the client with the invitation for the VR assessment
- Receive questionnaire that is returned filled in by the client
- Receive questionnaire that is filled in correctly by the client (e.g. not giving multiple answers on a question and readable answers according to the VR professional)
2. Preparation of VR assessment by VR professional
- Analyze the answers of the client on the questionnaire and the results of the decision aid on which factors are barriers
3. VR assessment with client: prioritizing barriers
- Discuss the answers of the client on the questionnaire and the results of the decision aid (which factors are barriers and which factors are facilitators) with the client
- Select most important RTW barriers (max. 3) in consultation with the client
- Select RTW barriers that are suggested by the decision aid or give arguments for deviating from the decision aid
4. VR assessment with client: choosing suitable VR intervention(s)
- Discuss VR interventions that are suggested by the decision aid with the client
- Select the most suitable VR interventions (max. 3) in consultation with the client
- Select VR interventions that were suggested by the decision aid or give arguments for deviating from the decision aid
5. Documentation
- Document outcomes of decision aid

Training session VR professionals

VR professionals were trained in the use of the decision aid in one day. During the training session, they received instructions on how the decision aid was developed and what the protocol steps (table 1) were. After this, VR professionals practiced working with the decision aid using several case vignettes. An overview of the learning objectives can be found in Table A1 in Appendix 2.

Data Collection

Data on the components of the Linnan and Steckler framework (15) and the ASE-model (16) were collected using quantitative and qualitative methods (i.e. checklists, questionnaires and interviews). An overview of the definition, operationalization and data collection of the components can be found in table 2.

Data analysis

The quantitative data were analyzed using descriptive statistics. The qualitative interviews were conducted by author CdG and author MdMB using a deductive approach. The interviews were recorded and then summarized by MdMB and verified by CdG. A coding scheme was constructed to categorize the information of the summarized interviews. The quantitative results were connected to the qualitative results using manifest content analysis. The unit of analysis was sentences or short paragraphs with sentences describing the same topic. CdG conducted the first round of coding and discussed the coding with MDMB. After this, the codes were categorized according to the components in this study (table 2). The categorization was discussed until consensus was reached with MDMB. The results were then discussed with all authors. The results of the qualitative analysis were used to support the quantitative results. Per theme, relevant quotes were retrieved from the interviews.

Table 2: Process measures and data collection

Key component	Definition	Operationalization	Data collection
Recruitment	*Professionals and clients* Procedures and number of initially recruited VR professionals and clients Representativeness and characteristics of the VR professionals and clients Reasons for non-participation	N/A	Researcher logs and checklist*
Reach	*Professionals* Number of professionals that participated in the study as proportion of number of professionals that were invited to participate *Clients* Number of clients that filled in the decision aid as proportion of clients invited to fill in the decision aid	N/A	Researcher logs and checklist*
Dosage	*Professionals* Extent to which the protocol steps were completed	A learning goal was adequately met if more than 75% of the participants scored (4) agree or (5) totally agree. For each client, the VR professional indicated which protocol steps (table 1) were completed. Per protocol step the total number of clients for which the step was completed was calculated. Only clients that filled in and returned the questionnaire, were included in these analyses.	Checklist* and semi-structured interviews** with VR professionals
Satisfaction and experience	*Professionals* Satisfaction and experience with the decision aid itself, with the work process of the decision aid and with the influence of the decision aid on their work compared to the usual situation *Clients* Satisfaction and experience with the questionnaire, with the decision aid and with the VR assessment	• "On a scale of 1 to 10, which grade would you give the decision aid" • "On a scale of 1 to 10, which grade would you give the work process based on the decision aid?". • 7 items on the extent to which the decision aid improved the different steps of the current work process. Answers were given on a five-point Likert-scale ranging from 'Fully disagree' to 'Fully agree'	Evaluative questionnaire and semi-structured interviews** with VR professionals and clients

Key component	Definition	Operationalization	Data collection
Barriers and facilitators	*Professionals and clients* Barriers and facilitators for the use of the decision aid.	13 items of the 'barriers and facilitators assessment instrument' (Peters et al. 2002). An example item is: " This decision aid gives me enough space to make my own assessments". Answers were given on a five-point scale ranging from 'Fully disagree' to 'Fully agree'. Items 1, 11,12 and 13 were reverse-coded.	Evaluative questionnaire and semi-structured interviews** with VR professionals and clients
Attitude	*Professionals* Attitude towards the use of the decision aid in daily practice	9 items based on a scale developed by Zwerver et al., 2013 (18). An example item is: "This decision aid supports in making complex decisions". Answers were given on a five-point scale (Fully disagree-Fully agree).	Evaluative questionnaire and semi-structured interviews** with VR professionals
Intention for future use	*Professionals* Intention to use the decision aid in daily practice	7 items based on a scale developed by Zwerver et al., 2013 (18). An example item is: "I have the intention to use the decision aid or parts of the decision aid in the future" Answers were given on a five-point scale (Fully disagree-Fully agree).	Evaluative questionnaire and semi-structured interviews** with VR professionals
Self-efficacy	*Professionals* Self-efficacy in the use of the decision aid in daily practice	10 items based on a scale developed by Zwerver et al., 2013 (18). An example item is: "I feel I have enough skills to use the decision aid in practice" Answers were given on a five-point scale (Fully disagree-Fully agree).	Evaluative questionnaire and semi-structured interviews** with VR professionals
Knowledge and skills	*Professionals* Self-perceived knowledge and skills to use the decision aid in daily practice	6 items based on a scale developed by Zwerver et al., 2013 (18). An example item is: "I have enough knowledge to use the decision aid in practice" Answers were given on a five-point scale (Fully disagree-Fully agree).	Evaluative questionnaire and semi-structured interviews** with VR professionals

* A checklist was used to measure recruitment, reach and dosage. ** An overview of the interview guide is given in Appendix 1.

Results

Recruitment and Reach

VR Professionals

In June 2021, twelve of the approached 24 VR professionals agreed to participate. Reasons for non-participation were: not meeting the inclusion criteria (e.g. currently not conducting VR assessments with clients with a work disability pension), and not enough time to participate in the study. Four participants of the twelve participating professionals dropped out of the study before including clients due to sickness, new work role, not having assessments with eligible clients, or no time to participate in the study.. To reach the planned number of ten participants, two additional VR professionals were recruited and trained separately. They did not evaluate the training, because they received a shorter version of the training (without case vignettes). In total ten VR professionals participated in this feasibility study and five of them were interviewed. See table 3 for their characteristics.

Table 3: Characteristics of VR professionals and clients

	VR professionals		Clients	
	N	**Median (Range)**	**N**	**Median (Range)**
Gender				
Male	1		2	
Female	9		6	
Age		52 (39-63)		47,5 (39-60)
Years of working experience with long-term disabled workers		6 (2-20)		

Clients

In total, ten VR professionals asked 54 clients to fill in the questionnaire of which 36 (67%) reacted. Reasons for non-response were: 1) Based on the telephone call the VR professional decided not to send the questionnaire, because the client indicated that he/she did not want to fill in the questionnaire, or because the VR professional thought the client was too vulnerable. 2) The questionnaire was not received on time by the client or returned on time to the professional. 3) The client received the questionnaire, but did not fill in the questionnaire due to personal circumstances such as: physically not able, mental problems, or thinking the questions were to personal. Thirty-two of the 36 clients received a VR assessment based on the decision aid. For four clients this was not the case, because the client still received treatment, the VR professional did not have enough time to discuss the questionnaire, or the VR professional did not receive the questionnaire on time. As a result, 32 of the 36 clients that filled in the questionnaire, received a VR assessment based on the decision aid.

Seventeen clients (53%) of the 32 clients for which the decision aid was used, agreed to be interviewed, of whom eight clients were selected by the researchers. See table 3 for their characteristics.

Training Session

All eight participants that evaluated the training rated the training with a 7 or higher (on a scale of 1-10, median = 8, range = 7-9). VR professionals especially appreciated the structure and the clarity of the training session. However, they also mentioned that time was too limited to properly practice with all the case vignettes and suggested to include more participants in the training session (training sessions included two to four VR professionals). Participants agreed that all learning objectives (Appendix 2) were met (range 4.0-4.4 on a scale of 1-5).

Dosage

Table 4 provides an overview of the number of clients and the extent to which protocol steps were completed.

1. Questionnaire of the decision aid

Thirty-six clients filled in the questionnaire of the decision aid. In most cases, clients were (n=33) informed by telephone about the questionnaire. Some VR professionals perceived these calls as time-consuming, because clients started to explain their personal situation during the phone call. Most clients returned a complete questionnaire (n=34) and filled in the questionnaire correctly (n=30). When information was missing, VR professionals discussed this with the clients during the VR assessment and added the information to the decision aid.

2. Preparation of VR assessment

The VR professionals did not always prepare for the VR assessment with the use of the questionnaire and the results of the decision aid. Reasons were that the VR professional had too little time to prepare the VR assessment because he did not receive the questionnaire on time, or a preference to hear the story of the client himself.

3. VR assessment with client: prioritizing barriers

With 26 of 32 clients, VR professionals first discussed the results of the decision aid (which factors are barriers for RTW), according to the protocol. VR professionals mentioned that clients often recognized themselves in the outcomes of the decision aid. VR professionals had different strategies of discussing the RTW barriers. Some VR professionals discussed all factors (including the facilitators), others only discussed the RTW barriers. As one VR professional explains:

> *I did not discuss all questions, only things that stood out to me and of which I thought: hmm…; then I asked. For example, one person left something unanswered [in the questionnaire]. Well, then [after asking] information came up that I did not know from the file. So I could discuss this more in depth. So…, someone happened to do voluntary work, and I found it strange that this had never came up during a previous assessment, but it did in to the questionnaire. And that is very valuable, right? I always think that this [voluntary work] will come up during the assessment, because someone doing voluntary work is in a different position than someone not doing voluntary work..*(VR professional 2)

For 21 clients the most important barriers were selected in consultation with the client. Some VR professionals selected the most important RTW barriers and then discussed these with the client to see if the client agreed these RTW barriers were indeed the most important. If this was not the case, the VR professional changed the most important RTW barriers in the decision aid. Other professionals first discussed the barriers and then, in discussion with the client, choose the most important RTW barriers:

> *Especially the questions that were highlighted in red, that is what you pay attention to, right? Sometimes it turned out not to be important for the client to act upon it [the red highlighted barrier] and sometimes it was. So in general I decided together with the client what was the most important to start working on. But that was guided by the answers, well, by the questionnaire actually.* (VR professional 1)

Some VR professionals did not select barriers due to 1) the VR professionals' conviction that the client was not ready, 2) not having enough time during the first meeting to discuss the barriers, 3) the personal situation of the client, or 4) specific wishes of the client.

4. VR assessment with client: choosing suitable VR interventions

In most of the cases the VR professional discussed the VR interventions that were suggested by the decision aid (n=25). If the client was deemed not ready to receive a VR intervention, VR professionals often planned new meetings to discuss suitable VR interventions.

For two thirds of the clients (n=21) VR professionals chose one or more suitable VR interventions. VR professionals perceived it as more difficult to use the decision aid for this step, than for determining the most important RTW barriers. The main reasons were that the VR interventions were formulated differently from usual care of the SSI, and the complexity of clients' problems. Some VR professionals used the decision aid to check their own ideas, others followed the decision aid to decide upon suitable VR interventions.

For more than half of the clients (n=17) VR professionals selected VR interventions that were also suggested by the decision aid. Sometimes, VR professionals deviated from the decision aid.

5. Documentation

For 23 clients the outcomes of the decision aid were documented. VR professionals used the decision aid to explain their choice for a VR intervention:

> *Yes, and just like I said, I used it for the method to work in an evidence-based way. Yes, so actually also just, (…) to explain why I did what I did. (VR professional 3)*

Table 4: dosage of decision aid

Protocol step	Yes	No	Reasons for not completing protocol step
Client filled in questionnaire of the decision aid (in time) (N=36)			
1. Questionnaire			
Client was asked by telephone to fill in questionnaire, before questionnaire was sent	33	3	No specific reasons mentioned.
Questionnaire and information was sent to client with the invitation for the VR assessment	35	1	Client was not ready to receive a VR assessment at the first meeting. Client received the questionnaire in the second meeting 5 weeks later.
Client returned a complete questionnaire	34	2	One client left one question unanswered. Another client left four questions unanswered.
Client filled in questionnaire correctly (e.g. not giving multiple answers on a question and readable answers according to the VR professional)	30	6	Clients that did not fill in the questionnaire correctly, made a mistake (e.g. giving multiple answers on a question) in two to six questions.
VR professional used decision aid in VR assessment (N=32)			
2. Preparation of VR assessment			
Professional analyzed the answers of the client on the questionnaire and the results of the decision aid on which factors are barriers	27	5	VR professional had too little time to prepare the VR assessment, due to not receiving the questionnaire on time or preference to hear the story of the client him- or herself to earn the trust of the client.

Protocol step	Yes	No	Reasons for not completing protocol step
3. VR assessment with client: prioritizing barriers			
Professional discussed the answers of the client on the questionnaire and the results of the decision aid (which factors are barriers and which factors are facilitators) with the client	26	6	Personal circumstances of the client or not having received the questionnaire on time.
Professional selected most important RTW barriers in consultation with client	21	11	According to the VR professional, clients were not ready to receive a VR intervention, due to personal circumstances of the client or because the client already had a job.
Professional selected RTW barriers that were also suggested by the decision aid	29	3	VR professionals selected other RTW barriers than suggested, because of barriers that became clear during the meeting or because of circumstances of the client.
4. VR assessment with client: choosing suitable VR intervention(s)			
Professional discussed VR interventions suggested by the decision aid with client	25	7	VR professionals thought the client was not eligible to receive a VR intervention. Several arguments were given: client has already received a VR intervention, client is at the moment not ready to receive a VR intervention. VR professionals often did plan a new meeting to discuss a relevant VR intervention.
Professional used decision aid to choose the most suitable VR interventions in consultation with client	21	11	VR professionals did not have enough time during the interview to discuss VR interventions, the personal situation of the client or specific wishes of the client.
Professional selected VR interventions that were also suggested by the decision aid	17	15	No additional specific reasons mentioned.
5. Documentation			
Outcomes of decision aid were documented	23	9	For some clients, the VR professionals did not do this, because the Excel file with the decision aid was too slow due to technical difficulties.

Satisfaction and Experience

VR Professionals

After using the decision aid in practice, all VR professionals rated the decision aid overall with a 7 or higher (range 7-8, median 8, on a scale of 1-10). Working with the decision aid in contact with the clients was rated with a 7 or higher by eight VR professionals, the two other VR professionals rated this with a 5 or a 6 (range 5-9, median 7.5, on a scale of 1-10). According to the VR professionals, the advantages of using the decision aid during the VR assessment outweighed the extra time it took. All VR professionals appreciated the complete overview the decision aid provided of the client before the first meeting. VR professionals noted that with the support of the decision aid, they could better identify the problems of the client (n=10 (fully) agreed), conduct the VR assessment (n=7 (fully) agreed) and use the perspective of the client in the assessment (n=7 (fully) agreed), compared to usual care. A VR professional described the advantages of the questionnaire as follows:

> *It gives a good insight in the opinion of the client on vocational rehabilitation. I can focus my conversation on this, which is more efficient. And, on top of this, in my experience, the client feels more heard. The client has the feeling that he or she is in control, which gives me the idea that this [decision aid] is of added value, because the client, has a different attitude during the conversation.* (VR professional 3)

Using the decision aid did not improve selecting suitable VR interventions for the client compared to usual care (n=6 neither agreed nor disagreed). VR professionals had mixed opinions on how the VR interventions are presented by the decision aid. Some VR professionals wanted the VR interventions to be more fitting with the overarching VR trajectories currently available at the SSI to offer the client. However, other VR professionals liked the opportunity to use the information to find a fitting VR intervention/ VR trajectory, while still being able to make their own decisions:

> *It would be easier if the decision aid would tell colleagues: this specific trajectory, or that trajectory. (…) but I actually expect from people who perform these assessments, that they will think for themselves. (VR professional 2).*

> *Considering the VR interventions, it is good that you can check yourself which products we have that we can use. (…) It is better to look more at the VR intervention directions than at products that already exist.* (VR professional 4)

VR professionals also indicated that the decision aid did not improve informing the client on VR interventions compared to usual care (n=4 neither agreed nor disagreed, n=2 disagreed). An overview of all statements and the responses is presented in table 5.

Table 5: added value of the decision aid compared to the usual situation n=10.

	(Fully) disagreed	Neither agreed nor disagreed	(Fully) agreed
Compared to usual care, using the decision aid improves:			
1. Identifying the problems in different domains of life of the client	0%	0%	100%
2. Conducting the VR assessment	20%	10%	70%
3. Selecting suitable VR interventions	0%	60%	40%
4. Informing the client about the VR interventions	20%	40%	40%
5. Supporting the selection of VR interventions with arguments	10%	30%	60%
6. Including the perspective of the client in the advice	10%	20%	70%
7. Documenting the results of the VR assessment	0%	40%	60%

Clients

Clients were satisfied with the decision aid. Most questions were clear to them and not too much of a burden to answer. Some clients regretted that they did not receive a copy of their answers on the questionnaire or an overview of the outcomes of the decision aid. Also, some clients mentioned that they missed the option to explain their answers in the questionnaire:

> *Filling in the questionnaire went quite smooth, actually. Not everything was equally…, well let me say it like this, …it was clear, but it was not so easy to give a clear answer. You are thinking: on one hand it's yes, and on the other hands it's no. Therefore, I made a comment at the end of the questionnaire about some questions of which I thought, well, I could not give a clear answer. At the end, I made a note for her [the VR professional].* (Client 1)

For some people, with medical conditions that influence their energy level, filling in the questionnaire was a burden:

> *There were many questions (…) but I knew already that it was quite a task. (...) So I discussed with [the VR professional] that I thought it was a lot, but that could also be me, because my energy level is very low. And I also have [physical complaints] so it was quite a burden for me, so to say.* (Client 2)

For some clients the questions felt inappropriate for their situation. One client already had a job and another client thought the questionnaire was not appropriate for his level of work capacity.

Clients appreciated that the VR professional already had information about their situation before the start of the meeting:

> *He [the VR professional] knew of course about my situation and that was pleasant Because otherwise I would get someone on the phone and tell my story again. And now you can take your time and think about it on paper, and then put it away again and [a little later] get back to it.* (Client 2)

Clients felt they had the opportunity to explain their answers in the meeting with the VR professional. They also felt heard and felt involved in the process of choosing RTW barriers and a fitting VR intervention.

Barriers and Facilitators

Figure 1 shows the barriers and facilitators that VR professionals (n=10) experienced while using the decision aid. Six of the VR professionals had a general resistance to working according to a protocol. VR professionals did not see the cooperation of colleagues (n=10 (fully) disagree/neutral), managers (n=10 (fully) disagree/neutral) or clients (n=9 (fully) disagree/neutral) as a barrier to using the decision aid in practice. Opinions varied about whether using the decision aid costs a lot of time; (n=4 (fully) agree, n=6 (fully) disagree/neutral).

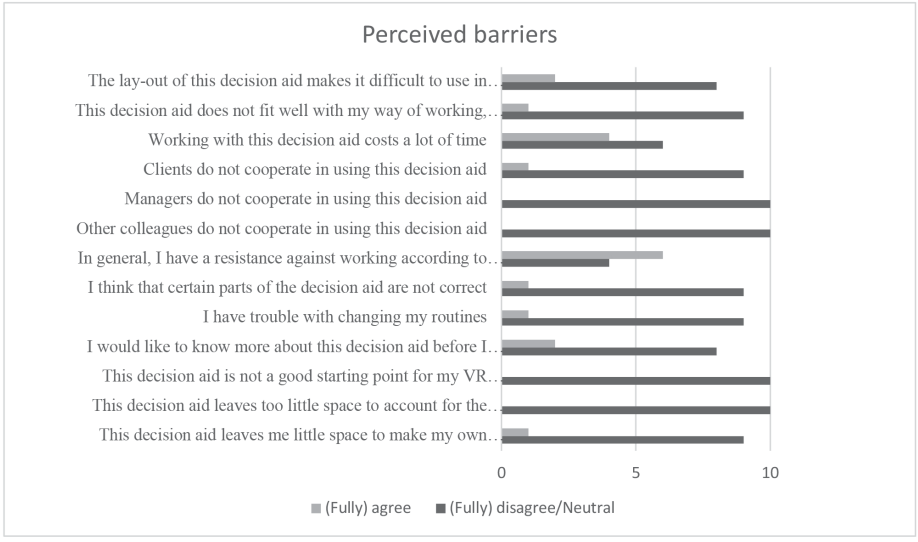

Figure 1: perceived barriers. (R): item was reversed.

In the interviews, VR professionals did not mention many barriers concerning the use of the decision aid. Barriers that were mentioned, were mainly related to the process that was chosen to implement the decision aid in this feasibility study. VR professionals agreed that this process should be altered when the decision aid is implemented in practice:

> *Questionnaires were not received on time, also people did not reply. Also, it was more labor intensive, because you had to get the questionnaire, fill in the questionnaire [in Excel]. I did chose to do this myself, because I know that our administration unit is already quite busy. But if you are going to implement this, then I would choose a different way.* (VR professional 2)

VR professionals would appreciate it if they could receive the decision aid filled in with the answers of the client. They also mentioned that the current decision aid is slow. A solution participants mentioned, is embedding the decision aid within the IT-systems of the SSI.

Attitude

In general, VR professionals had a positive attitude towards the use of the decision aid in practice (n=9 (fully) agree). The decision aid supports in further professionalizing the work of the VR professional (n=9 (fully) agree) and it improves the quality of VR care (n=9 (fully) agree). An overview of all quantitative results for attitude, intention for future use, self-efficacy and knowledge and skills can be found in Tables A2-A5 in Appendix 3.

Intention for Future Use

Eight VR professionals had the intention to use (parts of) the decision aid in the future. Six VR professionals indicated that they especially wanted to use the decision aid to get an overview of the RTW barriers of the client.

According to most VR professionals the use of the decision aid should not be mandatory in the future (n=8 (fully) agree). VR professionals do want to use the decision aid as a supportive tool in their assessments, especially if the barriers for the use of the decision aid mentioned above, are addressed.

> *I think it can work well in a supportive manner, especially for colleagues who are new, but I don't think that the decision aid, in this form, should be leading.* (VR professional 3).

> *Indeed, I see it has added value (…), as a supportive tool. In the assessment and in drawing conclusions, and in documentation, and overall.* (VR professional 5)

Half of the VR professionals (n=5) found the decision aid not applicable for all clients. In the questionnaire, VR professionals indicated that they would not recommend applying the decision aid for clients that have insufficient reading skills, have too little knowledge of the Dutch language or clients that are already participating in a VR intervention.

Self-efficacy

VR professionals felt confident in using the decision aid for most aspects of their assessment. Examples are: preparing the assessment (n=9 (fully) agree), getting an overview of the RTW barriers (n=10 (fully) agree), discussing with the client which barriers play a role in returning to work (n=10 (fully) agree), and choosing suitable VR interventions (n=9 (fully) agree).

Knowledge and Skills

Although all VR professionals felt they have enough knowledge and skills to use the decision aid in practice, half of them expressed the need for more training. VR professionals would appreciate to have peer-to-peer sessions to discuss the use of the decision aid with their colleagues once they were using the decision aid in practice:

> *I would like to have something more, maybe some sort of peer-to-peer session, or something on how to interpret, what do I do with it? Reading the questionnaire was not difficult, and to see where the points requiring attention were, was also not very difficult to me. But then the next step, which parts of the VR need attention, it is almost inside your head, right? The questionnaire sharpens you mind, but maybe there are also other things that should be intervened upon or that we should focus on. Thus, I could benefit from some more training or support with this [working with the decision aid].* (VR professional 1)

Discussion

Our results showed that, overall, most VR professionals were satisfied with the training and with the decision aid. Also, clients were satisfied with the VR assessments based on the decision aid. Important barriers for implementation could be the general resistance of VR professionals to working according to a protocol (some professional autonomy should remain) and the administrative process that was part of this study. VR professionals had the intention to use the decision aid in the future, but would appreciate additional training.

Comparison with literature

The result that VR professionals are positive about using the decision aid for identifying the most important RTW barriers for a client, is in line with earlier studies that developed tools for a similar population (i.e. (11) (12)). Most of the VR professionals in our study want to use (parts of) the decision aid in practice. Other studies also showed that most of the participating rehabilitation professionals were interested in working more evidence-based (19, 20).

We can conclude that some VR professionals perceive insufficient time as a potential barrier for using the decision aid. Earlier studies have also shown that barriers, such as lack of administrative support, insufficient time, and need for training can limit the use of evidence-based practices (19). Our results should, however, be seen in the light of the pilot phase of the decision aid.

Half of our VR professionals indicated a need for more training, especially in periodical discussions about working with the decision aid with colleagues. The importance of this need is supported by a study that showed the limited effect of a single workshop on long-lasting attitude, knowledge and intention to use evidence-based medicine (21). Clients appreciated that the VR professional already had information about their situation and that they had the opportunity to explain their questionnaire answers in the meeting. This way, the decision aid supports including clients in shared decision making. Shared decision making assists empowerment and self-determination in choices and decisions (22, 23). That clients are more satisfied with VR care if they feel part of the process (24), and that addressing barriers early on makes clients feel more heard (24, 25), strengthens this approach.

Strengths and Limitations

A strength of this study is that we used comprehensive components of theoretical frameworks ((15) (16)) to test the feasibility of the decision aid, which resulted in detailed information on its use and implementation in practice. Moreover, we included the perspectives of both VR professionals and clients and used a mixed methods design.

A limitation of this study is that selection bias is likely to have occurred in the selection of VR professionals and clients. The VR professionals in this study participated voluntarily and were motivated to use the decision aid in practice. Contrary to our instructions, the VR professionals selected clients (based on, for example, educational level). Therefore, it is likely that the results of this study are more positive than could be expected in a more general population of VR professionals and clients.

A final limitation is the limited length of this study, often only including the first or sometimes second meeting of VR professional and client. Information on VR interventions the VR professional determined using the decision aid after the first or second meeting with the client is not included.

Implications for Practice, Policy and Research

A decision aid can support VR professionals in guiding clients in returning to work. But to improve efficiency, it is essential to embed the decision aid in the IT-systems of the Dutch SSI. However, the digital literacy of the client population should be kept in mind.

Future research should indicate what level of VR interventions is the most feasible for this decision aid and whether the training should be altered to support VR professionals in choosing the correct VR trajectory. Also, the role of contextual factors on the RTW of this group should be addressed. Future research should focus on if and how contextual factors can be implemented in the decision aid.

The protocol should be refined to improve the accessibility of the decision aid, for example by including options to support the client with filling in the questionnaire, or by including criteria to help the VR professional determine for which clients the decision aid is suitable. On top of this, future research should indicate the content and form of additional training in the decision aid.

Future research should indicate if it is feasible to implement the decision aid among a general population of VR professionals and the total population of clients. Future studies should also focus on satisfaction of clients with the decision aid, with the care received by the Dutch SSI, and if the decision aid leads to more clients returning to work.

Conclusion

This study showed that it is feasible to implement and use the decision aid in practice. Identifying the most important RTW barriers was perceived as more feasible to use in practice than selecting the most suitable VR interventions. Overall, clients and professionals were satisfied with the decision aid, providing good reasons for further implementation.

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Appendix 1: Interview Guide

Themes discussed in the interviews with VR professionals and clients:

Interviews with VR professionals
How the VR professional used the decision aid
Barriers and facilitators of using the decision aid
Satisfaction with the decision aid
Future use of decision aid
Barriers and facilitators of implementing the decision aid
Influence of the decision aid on evidence-based working

Interviews with clients
Satisfaction with the questionnaire of the decision aid
Barriers and facilitators for filling in the questionnaire
Satisfaction with the process concerning the decision aid
Satisfaction with the contact with the VR professional
Satisfaction with the decision aid
Satisfaction with the suggested VR interventions

Appendix 2 : learning objectives for the training session

Table A1: Learning objectives for the training session

	The professional:
1	Knows how the decision aid was developed
2	Knows on which information the decision aid is based
3	Knows how the decision aid can be used in the assessment with the client
4	Knows how the decision aid can be used to recognize RTW barriers of the client
5	Knows what it means if a factor is a RTW barrier
6	Knows how the barriers are measured using the questionnaire
7	Can select the most important RTW barriers in the decision aid
8	Knows what the VR interventions used in the decision aid entail
9	Can select the most suitable VR interventions in the decision aid based on the client's needs
10	Knows how to document the results of the meeting(s) with the client

Appendix 3: Quantitative results attitude, intentions for future use, self-efficacy and knowledge and skills

Table A2: Attitude: (number of participants that fully disagree/fully agree, n=10)

		(Fully) disgree/ neutral	(Fully) agree
1	Dit instrument kan helpen bij het maken van complexe beslissingen The decision aid can support the VR professional in making complex decisions	2	8
2	Het instrument zorgt voor verdere professionalisering van arbeidsdeskundigen / adviseurs intensieve dienstverlening The decision aid stimulates professionalizing the work of the VR professional	1	9
3	Werken volgens het instrument is niet te rigide om toe te passen op de individuele werkzoekende (R) Working according to the decision aid is not too rigid to apply to the individual client	3	7
4	Het instrument zorgt voor een toename in de kwaliteit van de dienstverlening aan de WIA-WGA klant The decision aid increases the quality of VR care	2	8
5	Het instrument kan de AD/AID - klant relatie verbeteren The decision aid can improve the relationship between the VR professional and the client	3	7
6	Het instrument laat genoeg ruimte voor de autonomie van de AD/ AID(R) The instrument allows sufficient space for professional autonomy	3	7
7	Werken volgens het instrument belemmert professionals niet in het zich eigen maken van nieuwe inzichten betreffende WIA-WGA klanten(R) Working according to the decision aid does not hinder VR professionals in gaining new insights about clients	3	7
8	Ik kan me vinden in de inhoud van het instrument I agree with the content of the decision aid	2	8
9	Mijn houding ten opzichte van het instrument is positief I have a positive attitude towards the decision aid	1	9

Table A3: Intention for future use: (number of participants that fully disagree/fully agree, n=10)

	(Fully) disgree/ neutral	**(Fully) agree**
Ik heb de intentie om het instrument, of onderdelen van het instrument, te blijven gebruiken I intend to use (parts of) the decision aid in the future	2	8
Ik verwacht in de nabije toekomst elementen van het instrument te gebruiken I expect to use elements of the decision aid in the near future	3	7
Ik heb de intentie om het gehele instrument te blijven gebruiken of te gaan gebruiken I intent to keep on, or start using the entire whole decision aid	6	4
Het gebruik van het instrument bij begeleiding van de klant zou verplicht moeten worden It should be mandatory to use the decision aid when supporting clients	8	2
Klanten, die ik begeleid, zouden voordeel hebben van de implementatie van het instrument Clients that I support, would benefit from implementing the decision aid	2	8
Naar mijn mening, is het instrument voor alle klanten bruikbaar (r) In my opinion, the decision aid is applicable to all clients	5	5
Het gebruik van het instrument zal leiden tot meer uniformiteit in de begeleiding van WIA-WGA klanten naar werk Using the decision aid will result in more uniformity in guiding clients to work	3	7

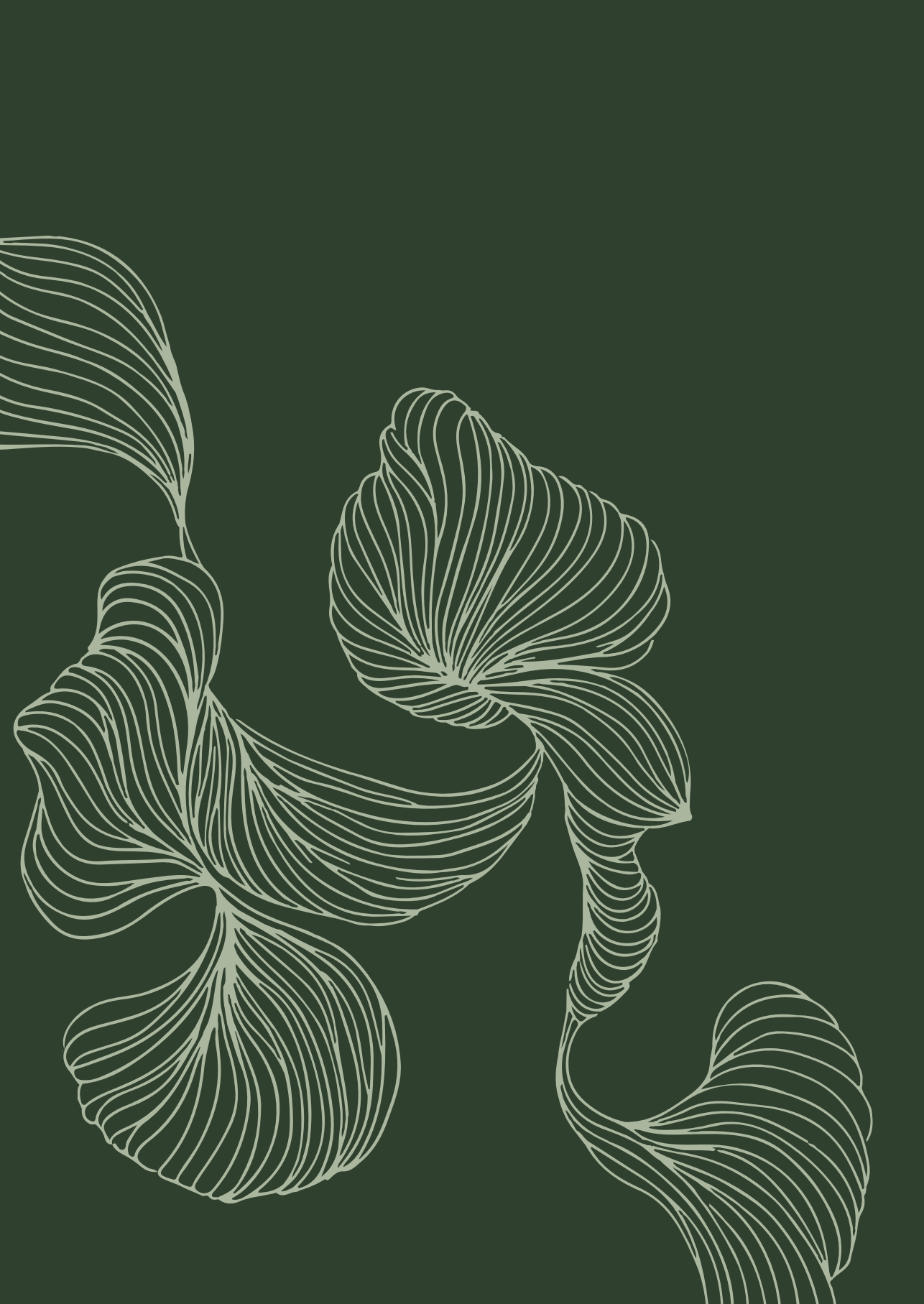
Table A4: Self-efficacy (number of participants that fully disagree/fully agree, n=10)

		(Fully) disgree/ neutral	(Fully) agree
1	Ik voel mij voldoende vaardig om het instrument toe te passen in de praktijk I feel sufficiently skilled for using the decision aid in practice	0	10
2	Het instrument heeft een positieve invloed op de kwaliteit van mijn begeleiding van de klant The quality of my support to clients is positively influenced by use of the decision aid	3	7
3	Het instrument is voor mij bruikbaar om het oriëntatiegesprek met de klant voor te bereiden The decision aid is useful in preparing the assessment with the client	1	9
4	Het instrument is voor mij bruikbaar om de informatie van SMZ in beeld te krijgen The decision aid is useful in gaining insight in the information from the work capacity assessment	9	1
5	Het instrument is voor mij bruikbaar om de belemmerende factoren voor werkhervatting van de klant in beeld te krijgen The decision aid is useful in providing an overview of the RTW barriers of the client	0	10
6	Het instrument is voor mij bruikbaar om in gesprek te gaan met de klant over waar de belemmeringen zitten om terug te keren naar werk The decision aid is useful for discussing the RTW barriers with the client	0	10
7	Het instrument is voor mij bruikbaar om in gesprek te gaan met de klant over welke belemmeringen aangepakt moeten worden The decision aid is useful for discussing with the client which RTW barriers should be addressed	2	8
8	Het instrument is voor mij bruikbaar om samen met de klant passende re-integratiedienstverlening uit te kiezen The decision aid is useful for choosing suitable VR interventions with the client	1	9
9	Het instrument is voor mij bruikbaar om de klant over te dragen aan het re-integratiebureau The decision aid is useful for the transfer of the client to the reintegration agency	2	8
10	Het instrument is voor mij bruikbaar om de klant te monitoren tijdens het re-integratieproces The decision aid is useful for monitoring the client during the vocational rehabilitation process	3	7

Table A5: Knowledge and skills (number of participants that fully disagree/fully agree, n=10)

		(Fully) disgree/ neutral	(Fully) agree
1	Ik heb voldoende kennis van het instrument om het toe te passen in de praktijk I have sufficient knowledge of the decision aid to use it in practice	0	10
2	Ik heb de vaardigheden om het instrument te kunnen gebruiken I have the skills to use the decision aid	0	10
3	Ik heb geen behoefte aan meer training en oefening in het instrument (r) I have no need for further training in using the decision aid	5	5
4	Ik heb genoeg tijd beschikbaar om met het instrument te leren werken (r) I have enough time available to learn how to use the decision aid in practice	6	4
5	De huidige werkwijze bij UWV laat voldoende ruimte om met het instrument te kunnen werken The current working process of the SSI leaves enough space for using the decision aid	6	4
6	Ik geloof dat het haalbaar is om het instrument in de praktijk te gebruiken I believe that it is feasible to use the decision aid in practice.	2	8

(r) : item was reversed.



CHAPTER 7

General discussion

The overall aim of this thesis was to develop and test an evidence-based decision aid for vocational rehabilitation (VR) professionals in order to enhance the quality of VR for individuals with a long-term (partial) work disability, to increase their chances on work participation. This chapter starts with a summary of the main findings of this thesis and methodological considerations. Then, the value of the decision aid for evidence-based VR is discussed. Finally, this chapter ends with recommendations for future research, policy and practice.

Main findings

1. In-depth analysis of Dutch VR

To get an overview of the current practice of VR in the Netherlands, we conducted an in-depth analysis of client files to investigate the VR the Dutch Social Security Institute (SSI) offers to people receiving a long-term (partial) disability pension (chapter 2). The VR of the Dutch SSI consists of two different trajectories with different aims. Because of the different aims, the trajectories are supposed to contain different interventions. However, we found that in practice the content of these tailored trajectories largely overlaps. It was difficult to determine why a certain trajectory was offered to a client, due to a lack of substantiation in the client files. Nevertheless, many trajectories were successful in reaching their goal. We concluded that professionals should be clear about which interventions should be offered to clients and why, in relation to the clients' barriers, to increase the clients' chances to work. Also, this substantiation should be documented in the client file. A decision aid may be a helpful tool for the professional in doing so.

2. Developing the decision aid

The second aim of this thesis was to develop an evidence-based decision aid to support Evidence-Based Practice (EBP) among VR professionals. In the scientific literature, we identified 58 factors that could be of importance to the return to work (RTW) of people on long-term sick leave. Furthermore, in a systematic literature review (chapter 3), we identified 25 VR interventions of which the effectiveness was tested among people on long-term sick leave. Ten of these interventions showed to be more effective on RTW for this group compared to usual care. This indicates that VR interventions can play a role in supporting people who have been on long-term sick leave to return to work. We also found that the content of the effective interventions varied widely, but effective interventions were often more extensive than usual care. Common elements were "motivational interviewing", "placing the client in work", "teaching practical

skills" and "advising at the workplace". We could not identify differences in elements between effective and non-effective interventions.

To determine which RTW factors and VR interventions should be included in the decision aid according to VR professionals, the retrieved RTW factors and VR interventions were utilized in a Delphi Study (chapter 4). Based on the results of this Delphi Study we have developed an evidence-based decision aid to support the methodology for VR professionals used by the Dutch SSI. For a pilot study, the decision aid was developed as an interactive Microsoft Excel document. The decision aid contains a client questionnaire that collects information on RTW factors that are, according to professionals, the most important for people with a long-term work disability, and contains VR interventions that target these factors. The RTW factors were structured according to the ICF model. The ICF model is a biopsychosocial model that conceptualizes functioning as "a dynamic interaction between health conditions and contextual factors (environmental factors and personal factors) (1)".

3. Testing the decision aid

After the development of the decision aid, it was tested in an experimental proof-of-concept study using case vignettes (chapter 5). This study showed that using the decision aid to identify the most important RTW barriers and to identify the most suitable VR interventions led to a larger agreement between professionals on a gold standard. This indicates that the decision aid can help to decrease practice variation and increase the quality of the VR services. The use of the decision aid did not increase the confidence of the VR professionals in their assessment.

The feasibility of using the decision aid in practice was tested in a feasibility study with actual clients (chapter 6). Ten VR professionals used the decision aid in their assessments of in total 32 clients. Both VR professionals and clients were in general satisfied with the decision aid. However, professionals were more satisfied with using the decision aid to identify important RTW barriers than with using it to identify the most suitable VR interventions. Professionals indicated that, to improve the use of the decision aid among VR professionals and clients, it is important that the decision aid is implemented in the digital systems of the SSI. VR professionals would also appreciate peer consultation on the use of the decision aid.

Methodological considerations

In this discussion, methodological issues with regard to three themes are addressed: 1) the quality of the research evidence, 2) including the client perspective in the development of the decision aid, and 3) the effectiveness of the decision aid.

In this thesis, the decision aid was developed based on both scientific evidence (Chapter 3) and expert consensus (Chapter 4) following the method of clinical guideline development (2). RTW factors and interventions aimed at people on long-term sick leave (> 90 days) were extracted from (scientific) literature. Since hardly any evidence was available for individuals who had been on sick leave for a duration exceeding two years, a Delphi study was conducted. In this study was determined, through expert consensus, which factors and interventions were applicable to the situation of our target population, i.e. people with a long-term (>2 years) sick leave duration.

While the decision aid incorporates both scientific evidence and perspectives of VR professionals and insurance physicians, it is crucial to acknowledge that perspectives of other important stakeholders, such as clients, employers, healthcare providers, and VR professionals employed at VR agencies that offer the VR interventions to the client, were not incorporated. Research shows that the various stakeholders in the VR of a client do not always have consensus on which RTW factors are deemed crucial. For example, stakeholders vary in their opinion on the importance of age, gender and the RTW recommendation by the physician for the RTW of the client (3).

Including the perspectives of clients is important, since clients are the subjects of the interventions. Moreover, they often have difficulties with the VR service (4), which can lead to secondary psychosocial harm (5). Applying for a work disability pension often causes high levels of stress in clients, which hampers their recovery and thus their return-to-work (6). Including clients in the development of a decision aid could have led to another selection of RTW factors and VR interventions in the decision aid. Which could have led to a tool that includes more of the needs and values of clients themselves, and may thus result in less difficulties and stress, as well as a better relation between the client and the VR service (7). Although the client perspective was not included in the developmental phase of the decision aid, in the feasibility study the client's perspective was included (Chapter 6). Having clients react on a prototype of the decision aid in the feasibility study may have been easier than thinking along from scratch. In this study, however, clients did not mention content-related feedback. The results are input for further, future development.

The efficacy and feasibility of the decision aid were tested in two studies. In the case vignette study (chapter 5) we have tested the proof of concept of the decision aid under controlled circumstances. The use of case vignettes made it possible to test the separate steps (both choosing the most important RTW barriers and the most suitable VR interventions) of the decision aid. Next, we tested the use of the decision aid in practice in a feasibility study (chapter 6). In this study, both VR professionals and clients reflected on the feasibility of using the decision aid in practice. Although both the case vignette study and the feasibility study provided important information on the potential efficacy of the decision aid on practice variation and implementation of the decision aid in practice, we were not able to test the effectiveness of the decision aid in real clients. To determine if the decision aid results in making VR more targeted to the client's barriers for RTW and more effective on sustainable return to work for this population, more research is necessary. An RCT could be carried out to investigate if using the decision aid in VR has a positive effect on faster and more sustainable RTW of clients.

Interpretation of the results

The findings of this thesis show that a decision aid can be a promising tool to support evidence-based practice by facilitating informed decision-making among professionals in VR. Evidence-based practice (EBP) is based on "*the integration of the best research evidence with clinical expertise and client values in making practice decisions" (p.9)* (8). In this paragraph we will explore how the decision aid that we have developed can contribute to EBP within VR.

Evidence-based practice in VR

1. Research evidence

The first element of EBP is the availability of relevant research evidence. Within EBP there is a hierarchy in research methods. Some methods, such as systematic reviews and meta-analyses are more reliable and are better to directly inform practice about effectiveness of interventions compared to other research methods (8). Like other areas of social (medical) care (8), the field of VR for long-term disabled workers is understudied. There is a lack of systematic reviews, meta-analysis and RCTs. The lack of research evidence for this specific population is two-fold, both evidence on facilitators and barriers for RTW and evidence on effective VR interventions is missing.

The Delphi Study (Chapter 4) and the decision aid developed in this thesis adds to the scientific evidence on VR of people with a long-term (partial) work disability, but further development is needed. For example, many interventions incorporated

in the decision aid could not be based on scientific evidence, since studies on their effectiveness among people with a long-term disability were either scarce or not available. On top of this, studies were often unclear about the RTW barriers that were targeted by the VR interventions or the assumed underlying working mechanism(s) of the intervention. VR interventions were often aimed at a specific target group, for instance individuals with a certain disease, without looking at the specific personal and external factors that might play a role in the life of the person. Thus, providing this link between RTW barriers and interventions in the decision aid was innovative. It requires research to further develop this evidence base.

Another advantage of the decision aid is that by suggesting suitable VR interventions that address the clients' barriers, it provides the VR professional with a course of action and reduces unwanted practice variation among professionals. In medicine, it was shown that tools can support professionals in delivering more effective personalized care. For example, the study by Taimela (9) showed that offering an occupational health intervention based on a tool which indicated the risk of a worker on sickness absence, is effective in lowering sickness absence days. In our feasibility study, professionals mentioned that the decision aid helped in identifying the problems of the client. However, the feasibility study also showed that the VR professionals had mixed opinions on how the VR interventions were included in the decision aid. Including more specific VR interventions instead could improve the personalized VR offered with the decision aid.

Lastly, the decision aid can play an important role in developing evidence-based rehabilitation pathways. The decision aid can be used during the whole process of VR; from the moment the client gets a medical assessment until the client has indeed returned to work. This data can be used to monitor the progress the client makes and can be used to tailor the interventions to the client's needs. A decision aid could also help in registering and analyzing this data.

2. Clinical expertise

The second element of EBP is the amount of clinical expertise of the professional. VR professionals in the Netherlands have diverse educational backgrounds and experiences. Additionally, they are not as well-organized as a profession as, for example, doctors are in professional associations that initiate research and develop evidence-based guidelines. Research shows that VR professionals are interested in EBP, but experience many barriers that prevent them from applying it in daily practice (10). Professionals experience difficulties with translating research into usable information and products (10). They also experience a lack of time (10), lack of support from colleagues and senior management (11), and a lack of supervisors with adequate

experience with EBP (11). There are thus many opportunities to improve the clinical expertise of the VR professional and to bridge the gap between research and practice. The decision aid can help to transfer scientific knowledge into practice in two ways:

1. The decision aid shows which evidence-based factors in general play an important role in the RTW of people with a long-term disability and shows which factors are a barrier for a particular client. Based on this information, the VR professional can get a better overview of which factors play a role in the situation of the client, and intervene on these, without having to study research articles themselves. That this is indeed feasible, is indicated in an earlier study that showed that the ICF framework and ICF tools can be a first step to support evidence-based practice by VR professionals. By helping identify common barriers and facilitators, and helping categorize these factors (12).
2. The decision aid shows which evidence-based interventions can be deployed to help the client return to work. This way, the decision aid has the ability to give professionals an overview of VR interventions that were proven (cost-)effective for this target population. Again, without the professionals having to look into scientific literature themselves.

Our study on the usual care for people with a long-term disability of the Dutch SSI (Chapter 2) showed that argumentation for why a particular VR intervention is offered to a client is often missing from the client file. Based on the client characteristics that were described in the files, we could also not determine which client characteristics were decisive for the professional to choose certain VR interventions. The lack of proper argumentation and documentation can lead to unwanted practice variation among VR professionals. By providing a step-by-step plan in the decision aid, VR professionals were helped in methodologically identifying relevant RTW barriers, discussing the barriers with the client and choosing suitable VR interventions in collaboration with the client. The decision aid also supports in documenting these steps. Following this method should reduce the unwanted variation in practice between VR professionals.

The decision aid is thus a tool to support the professional in delivering evidence-based personalized VR, and can address some of the barriers that prevent a professional from applying EBP. However, the decision aid was designed in such a way that it would not replace the professional. This is also how VR professionals view the decision aid. The feasibility study (Chapter 6) showed that VR professionals indeed viewed the decision aid as a tool that supported them in making the right decision:

> *"I see it as an added value (…), as a supportive tool. In the assessment and in the conclusion, and in the documentation, and overall. (13)"*

Although the decision aid can contribute to improving the evidence-based practice of VR professionals, more attention should be given to training them in its use. In the experimental study and the feasibility study, professionals received a training session of one day in which they learned how the decision aid was developed and how to use the decision aid in practice. Although professionals were in general satisfied with the training, they indicated that they would appreciate follow-up training sessions and peer-to-peer consultation sessions to discuss the use of the decision aid in practice and to exchange experiences with one another. These sessions were not included in the training of the professionals in our study. Earlier studies showed that follow-up sessions are important for implementing EBP. A study among insurance physicians showed that a single workshop has only a limited effect on long-lasting attitude, intention to use and knowledge of evidence base medicine (14). Similarly, a study among therapists showed that ongoing discussion, exchange of experiences and additional training after the initial training is critical to influence the adherence and skill of therapists use of evidence-based practice (15). Additional ongoing peer or expert consultations were also shown helpful for professionals to integrate innovations in existing practice (16).

3. Client values

The third element of EBP are the values of the client. The preferences, concerns and expectations of the client need to be acknowledged by the professionals to be able to properly help the client. This is in line with the idea behind shared decision making (SDM). When using SDM, not only scientific evidence is important in making a decision, but also informed preferences (what is important to patients and their families) (17). Although SDM is used in the curative sector, it can also play an important role in VR. In general, clients are willing to participate in SDM (18) and VR professionals see the importance of collaborating as a team with the client (19). Including the client in the decision making process is thus an important part of evidence-based VR. VR professionals are often only using a limited set of the steps of SDM (19). Therefore in the decision aid, we aimed to increase client involvement by having the professional discuss the main barriers and the choices for a VR intervention with the client and including this perspective in the decision.

The decision aid that we developed provides a well-defined framework for SDM that helps the professional involve the client in making decisions. This thesis showed that clients appreciated that they could tell their story to the professional based on the questionnaire they had filled in before the assessment. A VR professional that participated in the feasibility study described it as follows:

> *"And, on top of this, in my experience, the client feels more heard. The client has the feeling that he or she is in control, which gives me the idea that this [decision aid] is of added value, because the client, has a different attitude during the conversation (13)".*

The decision aid could also play a role in improving the trust of clients in the SSI. An earlier study showed that besides improving the RTW of the client, SDM can also improve the often difficult relationship between client and the social security system (7). In the feasibility study clients also mentioned that they appreciated that they got insight in which barriers played a role in their situation. The insight in the process the decision aid provides can help increase the trust clients have in professionals and the perceived justice of the VR process of the SSI.

Recommendations

Considering the results of this thesis and the discussion above, several recommendations can be made for future research, practice and policy. These recommendations are outlined below.

Recommendations for future research

To improve the quality of the evidence-based content of the decision aid, more research is needed on the VR of people with a long-term (partial) work disability. First, further research on identifying which factors are important for the RTW of people with a long-term disability is necessary. For example, by conducting a longitudinal study on which RTW factors play a role in the RTW of people with a long-term work disability or by conducting qualitative studies on the client's perspectives of relevant RTW factors. Second, further research is needed on which VR intervention works best to address a specific RTW barrier, specifically for people with a long term work disability. More studies, such as RCT's and process evaluations, are necessary to fill this gap. On top of this, the interventions in the studies should be described in more detail to identify which RTW barriers are addressed by VR interventions studied in RCTs to identify which elements make a VR intervention effective. As long as there is a lack of scientific evidence on this topic, expert-based evidence could be used to further explore relevant VR interventions and link the VR interventions to the RTW barriers.

In order to establish the effectiveness of the decision aid on the return to work of the client in practice, we recommend that an effectiveness study is conducted. For example, a RCT in which the intervention group receives VR services based on the decision aid, while the other arm receives usual care.

Recommendations for policy and practice

Next to the recommendations for future research, we also have recommendations for policy and practice.

After improving the decision aid, it is recommended to implement the decision aid in the VR of the SSI for people with a (partial) work disability pension to support transferring scientific knowledge to practice, to support the professional in offering personalized, evidence-based care to the client with a long-term (partial) work disability and to support the professional in documenting the steps taken with the client. The SSI should also investigate the use of the decision aid to identify the facilitators for RTW of the client and to make use of these in the RTW process. For a successful implementation of the decision aid in daily practice, it is recommended that professionals are supported by investing in the development and implementation of guidelines and training. Especially follow-up peer consultation sessions should be implemented in practice to support professionals in the use of the decision aid and EBP in general. It is also important that managers have the knowledge and skills to support VR professionals in using the decision aid and EBP in general, and by ensuring that VR professionals have sufficient time to (learn to) use the decision aid in daily practice and sufficient time to discuss working with the decision aid with their colleagues. Especially in the beginning learning how to work with the decision aid could cost more time. We recommend that the decision aid is implemented within the digital system of the SSI. To diminish barriers that the clients experienced it is important to ensure that the decision aid is accessible for all clients and that clients receive a copy of their answers on the questionnaire of the decision aid.

We also recommend to further explore the use of data to improve VR. The data collected by using the decision aid in practice can be used to monitor the progress of the client. Using the decision aid on separate moments during the VR process of the client, could perhaps make it possible to monitor during the VR process. On top of this, the data collected by the decision aid could help research on which RTW factors contribute the most to RTW of the client.

Next, we recommend to use the decision aid to promote SDM by involving clients in key decisions, in order to enhance client engagement and motivation, and to avoid stressful encounters between clients and SSI professionals. Key decisions in which clients should be actively involved are:

- Choosing the most important RTW factors that should be addressed in the VR intervention;
- Choosing the most suitable VR intervention;
- Choosing an appropriate provider for the VR intervention.

Lastly, we recommend that rehabilitation pathways are developed. The decision aid can be used throughout the entire VR process and can help improve the transfer of client information between the VR professional, the client and the VR agencies offering the intervention. By utilizing the decision aid multiple times throughout the VR process, the progress of the client can be monitored. However, more research and development on this is needed.

Taking the previous recommendations into account, we recommend that the decision aid is implemented in practice. One VR professional that participated in the feasibility study described the advantages as follows:

> *"It gives a good insight in the opinion of the client on VR. I can focus my conversation on this, which is more efficient. And, on top of this, in my experience, the client feels more heard.(13)"*

Conclusion

The overall aim of this thesis was to develop and test an evidence-based decision aid for VR professionals in order to enhance the quality of VR for individuals with a long-term (partial) work disability, to increase their chances on work participation. This thesis demonstrates that a decision aid which links RTW factors to effective VR interventions, supports professionals in delivering methodically, personalized, evidence-based VR to individual clients. The decision aid showed to be promising in decreasing unwanted practice variation among VR professionals. Moreover, we showed that the decision aid is feasible to use in daily practice and both VR professionals and clients are in general satisfied with using the decision aid. The decision aid can stimulate shared decision making between professional and client. Although additional research on the content and effectiveness of the decision aid is desirable, we conclude that a decision aid can be a valuable tool to improve the quality and effectiveness of VR services.

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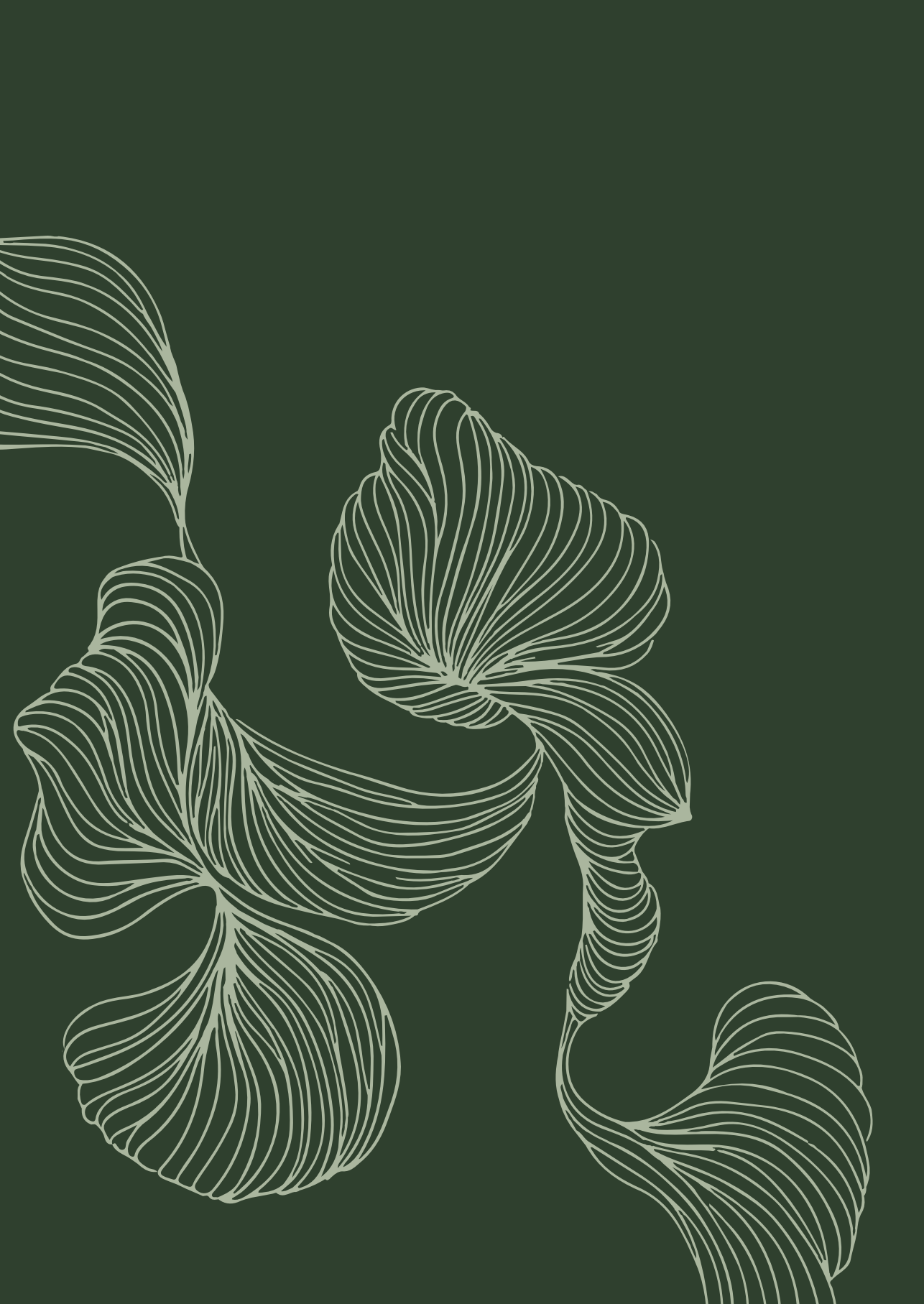

APPENDICES

SUMMARY

The number of people receiving a long-term work disability pension is growing. Being work disabled significantly influences an individual's life, since being employed has a positive impact on mental health, quality of life and well-being. Moreover, the growing number of people receiving a work disability pension leads to a large financial strain on society. Assisting people in their return to work is thus beneficial for both the individual and for society as a whole.

In the Netherlands, like in other Western countries, people who receive a work disability pension receive help from the Social Security Institute (SSI) to enhance their prospects of returning to work. Vocational rehabilitation (VR) professionals of the SSI identify return to work (RTW) barriers and offer VR interventions to tackle these barriers, in order to increase the chances of work for their client. However, the support offered by the SSI is often not based on scientific evidence, which can lead to unwanted practice variation among professionals and a lower quality of the VR services which people on a work disability pension (clients) receive. Thus, there is a need for more evidence-based VR services which are tailored to the needs of the client.

Tools, such as a decision aid, can help to improve personalized and evidence-based VR. A decision aid can support the VR professional in identifying which factors play a role in the RTW process of a specific client. Also, it helps in choosing VR interventions that are effective to address these RTW barriers, in order to increase the chances for the client to return to work.

Chapter 1 described the general introduction to this thesis, and outlined the objectives. The overall aim of this thesis was to develop and test an evidence-based decision aid for VR professionals in order to enhance the quality of VR for individuals with a long-term (partial) work disability, to increase their chances on work participation.

Objective I: Describe the current Dutch VR services for people who receive a (partial) work disability pension

In **Chapter 2** the current Dutch VR services for people who receive a (partial) work disability pension is described with the data of 197 clients who attended a VR trajectory at the Dutch SSI between January 2017 and December 2018. Based on the needs of clients, VR professionals can choose one out of two VR trajectories to offer the client. These trajectories differ in content, in purpose and in intensity and duration. The first trajectory, i.e. Fit-for-Work, is aimed at taking away the barriers of clients to be able to return to a workplace, and is a high intensity trajectory. An example of an activity within this trajectory is identifying what job a client wants to do. The second

trajectory, i.e. Ready-to-Work, is aimed at helping a client actually return to work (with activities targeting the return to paid work, e.g. improving job application skills), and is a trajectory with a lower intensity. However, although both trajectories have a different aim and supposedly different activities, the study showed that in practice their content largely overlaps. For both types, about half of the trajectories were effective in reaching the goal of the trajectory, while a fifth of the trajectories ended prematurely. The most commonly mentioned reasons for not completing a trajectory successfully, were that the barriers of the client were more complicated than first assessed by the professional and that the client was not able to find work.

Objective II: To develop an evidence-based decision aid to support clients and VR professionals in vocational rehabilitation to improve return to work and to reduce practice variation

In **Chapter 3** a systematic literature review is described. This systematic literature review aimed to identify effective VR interventions for enhancing the return to work of clients that are on long-term (>90 days) sick leave. The review was also aimed at identifying the elements that distinguish effective from non-effective interventions. Twenty-one articles were included in the review. Twenty-five different VR interventions were described in these articles, of which ten were more effective than usual care in facilitating the return to work of the client and two showed mixed results. The effective VR interventions varied widely in content, but were often more extensive in terms of intensity and duration. Common elements of these interventions "motivational interviewing", "placing the client in work", "teaching practical skills" and "advising at the workplace". However, we concluded that these elements were also often included in the VR interventions that were not effective on return to work compared to usual care. This led to the conclusion that it is difficult to establish what makes a VR intervention effective. To provide more insight into what makes VR interventions effective, future experiments should more extensively describe the population and content of the VR interventions that are being tested.

Chapter 4 described a Delphi study in which the most important RTW factors and effective VR interventions were determined for people with a long-term (work) disability. First, RTW factors that were relevant for people on sick leave (regardless of sick leave duration) were collected in (scientific) literature. These factors and the VR interventions that were identified earlier on (Chapter 3) were included in the Delphi study. A multidisciplinary panel consisting of labour experts, caseworkers and insurance physicians of the SSI first reached consensus on which RTW factors were the most important for the return to work of Dutch people who have been on sick leave for more than two years. For example, they agreed that the amount of motivation

to return to work and financial problems were important factors. They also reached consensus on which interventions should be used to target these factors. For example, they concluded that the factor "amount of motivation for return to work" could be targeted with an intervention aimed at improving the self-image and self-esteem. In general, we found that many of the factors that play a role in the return to work of people with a short-term sick leave, also play a role in the return to work of people with long-term sick leave. Also, many of these factors can be targeted with a VR intervention. These results were used to develop the content of our decision aid for VR professionals and clients.

Objective III: To test the efficacy and feasibility of the evidence-based decision aid

In **Chapter 5** an experimental study with case vignettes was described in which the efficacy of the decision aid was tested among 23 VR professionals. The experiment aimed to assess whether VR professionals, after following training in the use of the decision aid and having access to the results of the decision aid during their assessment, showed an increased agreement with a predefined gold standard. The experiment showed that using the decision aid led to a significantly higher agreement with the gold standard. This was the case for both identifying the most important RTW barriers, and for selecting the most suitable VR interventions. Using the decision aid, however, did not lead to a significant higher confidence of the professional in their assessment. This results show that a decision aid can be a promising tool to increase the quality and uniformity of assessments by VR professionals.

Chapter 6 focused on a feasibility study that described the implementation and use of the decision aid in practice. For this study, ten VR professionals used the decision aid in their daily work of assessment of clients and in advising them. Thirty-two clients, who receive long-term (partial) disability benefits, filled in the questionnaire belonging to the decision aid. These clients then received VR services based on the decision aid. Both VR professionals and clients were satisfied with the VR services. Only a few barriers, such as the inability to use the decision aid in the digital system of the SSI, clients not getting a copy of their answers on the questionnaire of the decision aid, the accessibility of the decision aid for all clients and a desire for further training in the decision aid, were mentioned. This study showed that it is feasible to implement the decision aid in the daily practice of VR professionals, provided that the barriers are addressed. However, to support the implementation of the decision aid it is necessary that the decision aid is integrated in the digital systems of the SSI.

In the general discussion in **Chapter 7** we concluded that a decision aid which links RTW factors to effective VR interventions can contribute to all three elements of evidence-based practice:

1. The decision aid helps in using scientific knowledge in practice;
2. The decision aid supports the professional in EBP by removing barriers, and;
3. The decision aid helps include the preferences of the client in the vocational rehabilitation.

After improving the VR interventions included in the decision aid, we suggest that the decision aid is implemented in daily practice. After implementation, however, it is necessary that the decision aid is refined with more evidence on the content and effectiveness of the decision aid.

Conclusion

This thesis showed that a decision aid can support professionals in providing personalized, evidence-based VR to clients with a long term disability pension, with larger involvement of the client. Further development of the decision aid with the lessons learned in this thesis and research on the effectiveness of this specific decision aid are necessary. However, the satisfaction of VR professionals and clients with the decision aid and the added value of decision aids in enhancing the quality and effectiveness of VR services, paves the way for implementation.

SAMENVATTING

Niet kunnen werken door arbeidsongeschiktheid heeft een grote invloed op iemands leven. Wel werken zorgt namelijk voor een hogere kwaliteit van leven en draagt bij aan een betere mentale gezondheid. Arbeidsongeschiktheid zorgt voor een financiële druk op de samenleving. Het ondersteunen van mensen met een arbeidsongeschiktheidsuitkering bij hun terugkeer naar werk is dus van belang voor zowel de persoon zelf als voor de samenleving. In Nederland ontvingen in 2023 253.000 mensen een WIA WGA-uitkering.

In Nederland krijgen, net als in veel andere Westerse landen, mensen die (al dan niet gedeeltelijk) arbeidsongeschikt zijn hulp om hun kansen op terugkeer naar werk te vergroten. In Nederland wordt deze hulp geboden door adviseurs intensieve dienstverlening en arbeidsdeskundigen van UWV (die we in dit proefschrift aanduiden als re-integratieprofessionals). Zij brengen onder andere belemmeringen voor terugkeer naar werk in kaart en bieden interventies aan om deze belemmeringen aan te pakken zodat zo de kans op succesvolle re-integratie toeneemt. De ondersteuning die deze professionals bieden, is echter vaak niet gebaseerd op wetenschappelijk bewijs *(evidence-based)*, omdat dit niet voorhanden is. Dit kan zorgen voor ongewenste praktijkvariatie onder de betrokken professionals en een lagere kwaliteit van de dienstverlening voor mensen met een arbeidsongeschiktheidsuitkering (die we in dit proefschrift aanduiden als cliënten). Er is daarom behoefte aan meer *evidence-based* re-integratiedienstverlening die meer is afgestemd op de specifieke behoeften van de cliënt en waarin de stem van de cliënt wordt meegenomen.

Instrumenten, zoals een beslishulp, kunnen bijdragen aan het verbeteren van *evidence-based* re-integratiedienstverlening en het op maat aanbieden hiervan. Een beslishulp kan de professional helpen bij het identificeren van de aanwezige belemmeringen die een negatieve rol spelen bij de terugkeer naar werk en de aanwezige sterke punten die positief zouden kunnen bijdragen aan werkhervatting. Daarnaast kan een beslishulp helpen bij het kiezen van relevante re-integratie-interventies die effectief zijn om deze belemmeringen aan te pakken. Dit alles om de kansen van de cliënt om succesvol terug te keren naar werk te vergroten.

Hoofdstuk 1 van dit proefschrift bevat de algemene introductie op het onderwerp en beschrijft de doelen van dit proefschrift. Het overkoepelende doel van dit proefschrift was om een *evidence-based* beslishulp te ontwerpen ter ondersteuning van de re-integratieprofessional en de effectiviteit en de haalbaarheid van het gebruik te testen. Het uiteindelijke doel daarvan was om de kwaliteit van de re-integratiedienstverlening

voor personen met een langdurige (gedeeltelijke) arbeidsongeschiktheid te verbeteren en hiermee hun kansen op terugkeer naar werk te vergroten.

Doel I: beschrijving van de huidige Nederlandse re-integratiedienstverlening voor mensen met een (gedeeltelijke) WIA WGA-uitkering

In **hoofdstuk 2** is de huidige Nederlandse re-integratiedienstverlening voor mensen met een (gedeeltelijke) WIA WGA-uitkering in kaart gebracht aan de hand van de gegevens van 197 cliënten die re-integratiedienstverlening hebben ontvangen bij UWV tussen januari 2017 en december 2018. In de huidige situatie kan de re-integratieprofessional kiezen uit twee re-integratietrajecten die aangeboden kunnen worden aan de cliënt. Deze keuze baseert de professional op de behoeften van de cliënt. Deze trajecten verschillen in inhoud, doel, intensiteit en duur. Het eerste traject, 'Werkfit', is gericht op het wegnemen en beheersbaar maken van belemmeringen om weer aan het werk te kunnen gaan. Dit is een intensief traject. Een voorbeeld van een activiteit binnen dit traject is een cliënt helpen ontdekken welk werk hij of zij zou willen gaan doen. Het tweede traject, 'Naar werk', is gericht op het helpen van de cliënt, die al klaar is om weer aan het werk te gaan, in het daadwerkelijk terugkeren naar werk. Een voorbeeld van een activiteit is het verbeteren van de sollicitatievaardigheden. Dit traject is minder intensief. Deze studie toonde aan dat - hoewel beide trajecten in theorie een ander doel hebben en andere activiteiten bevatten - de inhoud in de praktijk voor een deel overlapt. In beide categorieën was ongeveer de helft van de trajecten effectief in het bereiken van het doel, terwijl een vijfde van de trajecten voortijdig werd beëindigd (Werkfit: 21,5% en Naar werk: 15,1%). De meest genoemde redenen voor het niet succesvol afronden van een traject waren dat de belemmeringen van de cliënt complexer waren dan aanvankelijk beoordeeld door de professional en dat de cliënt geen werk kon vinden.

Doel II: het ontwikkelen van een *evidence-based* beslishulp om re-integratieprofessionals en mensen met een (gedeeltelijke) WIA WGA-uitkering te ondersteunen in de re-integratiedienstverlening om praktijkvariatie te verminderen en terugkeer naar werk te bevorderen

Voor het ontwikkelen van een beslishulp die professionals kan helpen bij het kiezen van bij de cliënt passende re-integratiedienstverlening, is eerst in de literatuur gekeken welke informatie daar al beschikbaar is. Vervolgens is deze informatie voorgelegd aan professionals om te kijken wat het best passend is bij de WIA WGA-doelgroep. Hieronder wordt dit proces nader beschreven.

In **hoofdstuk 3** wordt een systematische literatuurreview beschreven. Deze review had als doel effectieve re-integratiedienstverlening te identificeren voor mensen die langdurig (>90 dagen) niet kunnen werken door ziekte. De review was ook gericht op het identificeren van elementen die de effectieve interventies van de niet-effectieve zouden onderscheiden. In totaal werden 21 artikelen geïncludeerd in de review. In deze artikelen werden 25 interventies beschreven, waarvan er tien vaker tot werkhervatting leidden dan de gebruikelijke dienstverlening en waarvan twee wisselende resultaten lieten zien. Deze effectieve interventies waren erg verschillend qua inhoud, maar waren wel vaak intensief. Elementen die vaak in deze interventies naar voren kwamen, waren coaching, counseling en motiverende gespreksvoering. Deze elementen waren echter ook vaak aanwezig in de interventies die niet significant vaker tot werkhervatting leidden dan de gebruikelijke dienstverlening. We concluderen daarom dat het moeilijk is om vast te stellen wat een re-integratie-interventie effectief maakt. Dat zou eenvoudiger worden als toekomstige studies de deelnemers en de inhoud van de re-integratie-interventies die getest worden beter omschrijven.

Hoofdstuk 4 beschrijft een Delphi-studie waarin de belangrijkste factoren voor werkhervatting en werkzame interventies voor mensen met langdurig ziekteverlof (> 2 jaar) werd bepaald. Eerst werden factoren die belangrijk zijn voor de re-integratie (ongeacht de lengte van het ziekteverzuim) verzameld in de(wetenschappelijke) literatuur. Slechts enkele van deze factoren waren van toepassing op mensen met een langdurig ziekteverlof. De factoren en de eerder verzamelde re-integratie-interventies (zie hoofdstuk 3) werden geïncludeerd in deze Delphi-studie. Een multidisciplinair panel bestaande uit arbeidsdeskundigen, adviseurs intensieve dienstverlening en verzekeringsartsen van UWV werd gevraagd om consensus in de groep te bereiken over welke factoren het belangrijkst zijn voor de re-integratie van mensen met langdurige ziekteverlof. Het panel bereikte consensus over welke factoren belangrijk waren voor de werkhervatting van deze doelgroep (bijvoorbeeld motivatie om terug te keren naar werk en financiële problemen). Ook bereikten ze consensus over welke interventies ingezet kunnen worden om de belemmerende factor te verminderen. Zo kwamen ze bijvoorbeeld tot de conclusie dat de factor ‘motivatie’ beïnvloed kon worden met een interventie gericht op het verbeteren van het zelfbeeld en zelfkennis, en dat de factor ‘financiële problemen’ aangepakt kan worden door te verwijzen naar een andere instantie. Veel van de factoren die een rol spelen in de re-integratie van mensen met een korter ziekteverlof blijken ook van belang voor de re-integratie van mensen die langdurig verzuimen. Een groot gedeelte van deze factoren kan aangepakt worden met een re-integratie-interventie. De resultaten van deze Delphi-studie zijn vervolgens gebruikt om de inhoud van een beslishulp voor re-integratieprofessionals en cliënten te ontwikkelen.

Doel III: evaluatie van de *evidence-based* beslishulp

In **hoofdstuk 5** wordt een experimentele studie omschreven waarin gebruik werd gemaakt van cliëntcasussen. In deze studie werd de beslishulp geëvalueerd door 23 re-integratieprofessionals. Het experiment was erop gericht om te onderzoeken of professionals die getraind zijn in het gebruik van de beslishulp en de uitslag van de beslishulp tot hun beschikking hebben, vaker belemmeringen en interventies kozen die overeen kwamen met een gouden standaard. De gouden standaard bestond per casus uit de belemmeringen en interventies die het best bij die fictieve cliënt pasten en was eerder samengesteld op basis van consensus onder re-integratieprofessionals. Het experiment liet zien dat het gebruik van de beslishulp leidde tot een significant hogere overeenkomst met de gouden standaard. Het gebruik van de beslishulp leidde echter niet tot een significant hoger vertrouwen van de professional in zijn of haar beoordeling. We concluderen dat de beslishulp een veelbelovend instrument zou kunnen zijn om de kwaliteit van de dienstverlening van re-integratieprofessionals te verhogen.

Hoofdstuk 6 focust op een haalbaarheidsstudie waarin de implementatie en het gebruik van de beslishulp in de praktijk werden onderzocht. Voor deze studie hebben tien re-integratieprofessionals de beslishulp gebruikt in de dienstverlening aan de cliënt en in hun bijbehorende advies naar de cliënt. Tweeëndertig cliënten vulden deze vragenlijst in en kregen vervolgens dienstverlening gebaseerd op de beslishulp. Zowel re-integratieprofessionals als cliënten waren tevreden met deze dienstverlening. Re-integratieprofessionals gaven bijvoorbeeld aan dat de vragenlijst hen hielp bij het voeren van een meer inhoudelijk gesprek. Cliënten gaven aan dat ze het fijn vonden dat, doordat zij voorafgaand aan het gesprek een vragenlijst hadden ingevuld, de re-integratieprofessional voor het gesprek al informatie over hun situatie had. Er werd ook een aantal belemmeringen genoemd voor de implementatie van de beslishulp. Zo was het voor professionals belemmerend dat de beslishulp niet in het digitale systeem van UWV was geïntegreerd en is verdere training in het gebruik van de beslishulp gewenst. Ook moet nagedacht worden over de toegankelijkheid van de beslishulp voor de cliënt. Deze studie liet zien dat het haalbaar is om de beslishulp in de dagelijkse praktijk van de re-integratieprofessional te implementeren. Het is dan echter wel belangrijk om de genoemde belemmeringen aan te pakken.

In de algemene discussie in **hoofdstuk 7** wordt geconcludeerd dat een beslishulp waarin belemmeringen voor werkhervatting gekoppeld worden aan re-integratie-interventies re-integratieprofessionals ondersteunt in alle drie de onderdelen van *evidence-based* werken:

1. De beslishulp ondersteunt in het gebruik van wetenschappelijke kennis in de praktijk;
2. De beslishulp ondersteunt de professional in *evidence-based* werken door het wegnemen van mogelijk barrières hiervoor en;
3. De wensen van de cliënt kunnen door het gebruik van de beslishulp beter en makkelijker worden betrokken in het re-integratieproces.

Na het verbeteren van de interventies in de beslishulp, raden wij UWV aan dat de beslishulp wordt geïmplementeerd in de re-integratiedienstverlening aan mensen met een WIA WGA-uitkering. Vervolgens kan gewerkt worden aan het verbeteren van de inhoud en effectiviteit van het beslishulp.

Conclusie

Dit proefschrift laat zien dat een beslishulp re-integratieprofessionals ondersteunt in het geven van gepersonaliseerde, *evidence-based* dienstverlening aan mensen met een WIA WGA-uitkering. Op basis van de uitkomsten van dit proefschrift kan de beslishulp verder ontwikkeld worden. Daarnaast is meer onderzoek nodig naar de effectiviteit van de beslishulp. Desondanks toont dit proefschrift aan dat professionals en cliënten tevreden zijn met re-integratiedienstverlening waarin gebruik wordt gemaakt van een beslishulp en dat de beslishulp waardevol kan zijn om de kwaliteit en effectiviteit van de re-integratiedienstverlening te verbeteren, wat de weg vrijmaakt voor implementatie van de beslishulp in de praktijk.

ABOUT THE AUTHOR

Christa was born in Dirksland on March 12, 1994. After obtaining her VWO diploma at C.S.G. Prins Maurits in Middelharnis in 2012, she started a bachelor's program Sociology at the Erasmus University Rotterdam. During the Sociology program she also started with a bachelor's program Philosophy of a Science and completed several courses of the bachelor's program in Law. She earned her bachelor's degree Sociology in 2015 and her bachelor's degree Philosophy of a Science in 2018. In 2016, she started with a research master's program Public Administration and Organisational Science at the University of Utrecht. She received her master's degree from this program in 2017.

After a brief period working in a traineeship at UWV, Christa started her PhD at the Department of Public and Occupational health at Amsterdam UMC in 2018. She was involved in teaching and mentoring Psychology and Health Science students in addition to her research activities. She also completed several epidemiology courses of the post-graduate Epidemiology program of VU University Medical Center.

Christa currently works as a researcher at the research center of seven municipalities in the Netherlands (Onderzoekcentrum Drechtsteden), where she conducts research on social, health, and cultural topics.

LIST OF PUBLICATIONS

Publications in this thesis

de Geus, C.J.C., van Rijssen, H.J., de Graaf-Zijl, M., Anema, J.R., & Huysmans, M.A. (2024). Tailored vocational rehabilitation for people with a work disability pension in The Netherlands; an in-depth data analysis of the content and outcomes of vocational rehabilitation trajectories of the Social Security Institute. Disability and Rehabilitation, 1-8. https://doi.org/10.1080/09638288.2024.2328335

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Publications not included in this thesis

de Geus, C.J.C., Ingrams, A., Tummers, L. and Pandey, S.K. (2020), Organizational Citizenship Behavior in the Public Sector: A Systematic Literature Review and Future Research Agenda. Public Admin Rev, 80: 259-270. https://doi.org/10.1111/puar.13141

PORTFOLIO

PhD training program Amsterdam public Health research institute (APH)
Name: Christa de Geus

Name	Year	EC
Courses		
Systematische reviews en meta-analyse	2018	2.00
Kwalitatief onderzoek in de praktijk van de gezondheidszorg	2018	2.00
Research integrity course	2018	2.00
Principes van epidemiologische data analyse	2018	3.00
Regressie technieken	2019	5.00
Epidemiologisch onderzoek: basisprincipes	2019	4.00
Medische basiskennis	2019	8.00
Praktische epidemiologie: het opzetten van een onderzoek	2019	4.00
Conferences		
Attending EUMASS 2018	2018	1.00
Poster presentation Bedrijfsgeneeskundige dagen	2019	1.00
Poster presentation Verzekeringsgeneeskundige dagen	2019	1.00
Presentation EUMASS 2021	2021	2.00
Other academic activities		
Journal club department of Societal Participation and Health	2018	1.00
Meetings department of Societal Participation and Health	2018	1.00
Teaching/Student supervision		
Workgroup tutor Health@Work bachelor Health Sciences	2020 & 2021	2.00
Supervising thesis master student Psychology	2021	1.00
Total number of ECTS credits		**40**

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