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This chapter presents the current scientific knowledge about the effectiveness of workplace interventions implemented to facilitate return to work and some of the challenges linked to their implementation.

21.1 Introduction

This chapter presents a synthesis of knowledge on the effectiveness of interventions directed at the work situation: workplace interventions aiming a long-lasting return to work (RTW) for sick-listed workers. The definition of a workplace intervention and its objectives are described, and the participatory process is introduced as an approach for workplace interventions. Examples of changes at the workplace and in the work organization are provided to illustrate types of work adaptations that can be implemented at the workplace, and finally the effectiveness of workplace interventions is described. Before presenting these key points about workplace interventions, a case

illustration is presented in Fig. 21.1. The case highlights the issue of the usefulness of workplace interventions in a challenging situation in which the health condition and disability status are highly influenced by the individual's workload and work demands.

21.2 Rational for Developing Workplace Interventions

Timely RTW is of great benefit for both the injured workers and their employers. The longer a worker is unable to work, the higher is the probability that he/she will not RTW at all. Both personal and work factors interfere with this process. At the personal level, low self-motivation and low self-efficacy to go back to work make it harder to initiate the RTW process, especially when problems at work are related to the reason for sick leave (Briand et al. 2007; Labriola et al. 2007). At the workplace level, coworkers take over the tasks of the worker on sick leave, work piles up, or another worker is hired to take over the tasks.

The influence of personal and workplace factors on activity and participation levels has been recognized by the World Health Organization's International Classification of Functioning, Disability and Health (ICF) (World Health Organization 2001). If the cause of work disability is associated with workplace factors, then a return to an unchanged workplace (with or without appropriate treatment for the disorder) may

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Sheila, 42 years old, married with two children, is one of the most experienced and motivated workers at a financial department. She has been working at the department since 1999. Her main task is the processing of invoices into the computer. Because of her experience and knowledge of the department, colleagues frequently ask her for advice and she helps them with their tasks.

Since February 2007, resulting from a restructuring within the company, time pressure has increased for everyone, and there was a huge increase in the number of invoices. Even though the pile of invoices lying on Sheila's desk waiting to be processed was increasing, she did not ask her colleagues to assist her. Requests for her advice still continued and despite the high work pressure Sheila continued to help her colleagues although with less enthusiasm and often as quick and as minimal as possible. During the last months she got headaches by the end of the morning more often, got teasily frustrated and irritated when colleagues did not understand her. By the end of the day Sheila was very tired but she had sleep problems during the night, lost her motivation to undertake sport and social activities after work, had frequent arguments with her husband and was easily annoyed by her children. After a long-lasting period of increased workload, Sheila was no longer able to carry out her work, and she took sick leave in August 2007. Her occupational physician diagnosed her complaints to be an adjustment disorder. She felt exhausted all day, suffered from sleeplessness and concentration problems. During the first three weeks of sick leave Sheila slept a lot by day because of her tiredness and she consulted her occupational physician. During the first consultation of the occupational physician, Sheila was reassured, discussed her complaints and got more insight into the causes of her breakdown. The occupational physician informed her about the normal course of adjustment disorders and sick leave and advised an active approach to solve her problems. Although she felt somewhat better during the second consultation, she still reported concentration problems and felt tired. Sheila was now even more distressed since she had not been able to perform any tasks at home or usual activities with her children during the last two weeks. Together with the occupational physician she prepared a schedule to start performing the necessary tasks of daily living, such as children's care and housekeeping. A next session was planned in about one week and Sheila gave permission to contact her supervisor to propose a workplace intervention using the participatory approach.

Fig. 21.1 Case illustration—an example of the need for a workplace intervention

not be successful and may even lead to recurrences of sick leave with longer duration (Adler et al. 2006; Sanderson and Andrews 2006). Personal and workplace factors may turn out to be barriers to RTW. For instance, concentration problems hampering accurate execution of calculations (cognitive work demand) or a height of the desk that is too low (workplace design) may exacerbate pain sensation. Therefore, it is important to identify and reduce potential barriers due to work demands in order to increase the chances for a successful RTW (Nordqvist et al. 2003; Schultz et al. 2007; Young et al. 2005).

21.3 Definition of a Workplace Intervention

For the purpose of this chapter, workplace interventions are defined as interventions focusing on changes in the workplace and equipment design, or in the work organization (including working relationships), or in the job situation, or in the environmental conditions. They can also be the

actions taken for proper occupational (case) management with the active participation of the worker and the employer (Anema 2004; Franche et al. 2005). Active participation is defined as face-to-face conversations about RTW issues between the worker and the employer (or at least involving these two workplace actors).

The definition of “workplace interventions” proposed has been inspired by the International Ergonomic Association's definition (Stapleton 2000) and the Waddell and colleagues' definition of occupational interventions (Waddell and Burton 2001). Workplace and equipment design include changes in the workplace furniture, tools, or materials needed to perform the work tasks. Changes in work organization include, for instance, changes in work schedules or tasks, training in task performance, and communication processes between coworkers. Changes in the job situation refer to the financial and contractual arrangements to facilitate RTW; changes in the work environment concern noise, lighting, vibration, etc.

In summary, workplace interventions include all interventions that are closely linked to the

workplace (work focused) including either work adaptations or involvement of stakeholders from the work environment. This implies that all worker-focused interventions directed to an increase in the work capacity of workers, without changes to the workplace itself or without participation of workplace players in the RTW process, are not within the scope of this chapter (see Chap. 20).

21.4 An Example of the Participatory Approach

Several approaches for selecting the changes to be implemented in the workplace exist. The participatory approach is the most well known in the field of work disability prevention. A particular advantage of this participatory approach is that different stakeholders are active participants throughout the whole process of development and implementation of the changes, which may increase the possibility of a more sustainable and successful RTW (Loisel et al. 1994; Anema et al. 2003).

Participatory interventions are relatively new in the field of RTW research but are well known in the primary prevention of work-related musculoskeletal disorders (de Jong and Vink 2002). Often, the recommendations obtained by this type of intervention are about the necessary changes to working methods; however, this change is rather difficult. Sometimes workers do not perceive changes as a necessity, and they are often expensive. Sometimes workers refuse to adopt new working methods, or it is difficult to find the most appropriate improvement(s) aimed at a reduction of musculoskeletal load and an increase in efficiency in work (de Jong and Vink 2002). The idea behind a participatory approach is that participation of workers may help to overcome these implementation difficulties (Noro 1999). This step-by-step approach usually requires the involvement of a group of workers, supervisors, and a facilitator (i.e., a RTW coordinator) in order to arrive at a consensus about the best solutions for workplace problems. This group-based participatory approach was adopted by Anema and

colleagues with the purpose of uncovering RTW issues for an individual worker and for designing workplace interventions accordingly (Anema et al. 2003).

In this adaptation, individual participatory workplace interventions comprised of six phases as follows: organizational preparation, an inventory of barriers for RTW, thinking of solutions, preparing the implementation, implementing solutions, and evaluation/control.

In the first phase of the participatory approach, several meetings between a RTW coordinator (=case manager), the sick-listed worker, and the supervisor were planned. At that phase other stakeholders including human resource personnel and the occupational physician are informed about the process by the RTW coordinator who also must collect information about who is the person or department responsible for adjustments in the workplace. The second phase comprises two meetings between the RTW coordinator, the worker, and the supervisor. These meetings are intended to identify barriers for RTW. In the first meeting, the worker completes an overview of his or her tasks at work and identifies obstacles for RTW in a structured interview with the RTW coordinator. They rank the obstacles according to their priority, which is determined on the basis of their frequency and perceived importance. In the second meeting, the supervisor identifies obstacles for RTW from his or her perspective. Table 21.1 shows an example of a matrix including the overview of tasks, obstacles for RTW, and the priority ranking, filled in by the RTW coordinator during the first and second meetings, based on the case of Sheila presented in Fig. 21.1. Few barriers at the workplace were identified in the two meetings by Sheila and her supervisor Tom: a high workload due to the pile of invoices, concentration demands during the processing of invoices on the computer, assistance to colleagues taking time away from her main tasks, and her own difficulty in delegating tasks to others while chairing in the weekly meetings. The high workload due to the pile of invoices occurred continuously; thus, the frequency was rated with the maximum number of stars (four) and this problem was also rated with high importance as an obstacle

Table 21.1 Matrix: examples of identified obstacles for RTW and priority settings

Main tasks	Activities	Obstacle	Frequency	Importance	Priority
Processing of invoices	Arranging invoices	High workload due to pile of invoices	*****	***	1
	Putting invoices into the computer	Concentration problems (too much invoices, very accurate work)	***	***	3
	Archiving invoices				
Helping colleagues with difficult invoices	Giving advice to colleagues	Time consuming, less time for own work	***	***	2
Organizing weekly meetings about distribution of work	Preparing meetings				
	Chairing meetings	Difficulties with delegation of tasks	*	*	4

Name of worker: Sheila

Name of supervisor: Tom

Name of RTW coordinator: Helen

Frequency: report if a certain task occurs frequently or not:

* = Only once in a while (for instance, once a week or month)

** = On a regular basis (for instance, a few times a week, sometimes once a day)

*** = Often (more times a day)

**** = Always (every hour of the day)

Importance: report the importance of every obstacle:

* = Somewhat important

** = Important

*** = Very important

for RTW (three stars). Difficulties with delegation of task during the weekly meetings occurred once a week and were rated as a somewhat important obstacle. Based on the frequency and the importance, the four barriers were ranked with high workload as the first priority and the difficulties with delegation of tasks as the fourth priority (Table 21.1).

In the third phase a third meeting with both the worker and the supervisor takes place. The worker, the supervisor, and the RTW coordinator are jointly involved in a group session to brainstorm solutions. They rank the solutions according to priority, based on feasibility, solving capability, and short-term applicability of the suggested solutions. Table 21.2 shows the matrix of solutions for returning to work and priority setting filled in by the RTW coordinator during the third meeting. The brainstorm session in the case of Sheila resulted in three solutions for the high workload for processing the invoices. Sheila’s job description should be revised in order to clarify her work responsibilities, some extra meetings with Tom about planning her tasks were recommended, and some colleagues should assist in processing the invoices to distribute the workload over all workers in the

department. Based on the criteria for solving capability and the usefulness for decreasing the barrier for a RTW, the last solution regarding the assistance of colleagues with processing the invoices got the highest priority. After the priority ratings, a plan for RTW was formulated in the fourth phase, and the implementation of work adaptations was planned. The matrix used for this fourth phase is shown in Table 21.3. This matrix summarizes all actions that followed from the chosen solutions, for example, scheduling extra meetings and contacting a company social worker to plan training. Furthermore, the matrix specifies the person responsible (Sheila or Tom in this case) and the period of time to implement the solution. The fifth phase was directed to the implementation of work adaptations at the workplace, and if needed a visit for instructions regarding work adaptations was conducted by the RTW coordinator.

In the final phase (sixth phase), the plan for RTW is evaluated by phone and information regarding the actual implementation of solutions and improvements is collected from the worker and supervisor. Follow-up or case management after the implementation of the workplace intervention is discussed with the worker and supervisor.

Table 21.2 Matrix for solutions for RTW and priority setting

Obstacle	Solution	Assessment of criteria			Priority
		1	2	3	
High workload	Job description for clarity about Sheila's responsibilities	++	+++	+	3
	Extra meetings with Tom about planning	+++	+++	+	2
	Spread of workload over workers in department	+/-	+	+++	1
Difficulties with delegation of tasks	Training in delegation of tasks	+++	++	+++	1
	Feedback from Tom after the weekly meetings	++	+++	+	2

Criteria:

1: Solution exists and can be realized in the short term

2: Solution is inexpensive and can be purchased in this framework

3: Solution helps in eliminating/decreasing obstacle for RTW

Meaning of plus and minus signs:

--=A negative score on this criterion (cannot be realized, expensive, does not decrease obstacle for RTW)

=Positive score on this criterion (may vary from + to +++)

+/-=has both positive and negative aspects

Criterion has both positive and negative aspects

Table 21.3 Matrix for planning implementation of solutions at the workplace

Obstacle	Solution	Action	Person responsible	When	Done
High workload	Clarity about Sheila's responsibilities	Write job description	Tom	10-10-2007	dd-mm-yyyy
	2 daily meetings (5 min) about planning	Schedule appointment in the morning and afternoon	Sheila, Tom	From start RTW	dd-mm-yyyy
	Spread of workload over workers in department	Consideration of new schedules for next year	Tom	November 2007	dd-mm-yyyy
Difficulties with delegation of tasks	Training in delegation of tasks	Contact with company social worker to plan training	Sheila	This week	dd-mm-yyyy
	Feedback from Tom after the weekly meetings	Schedule 15 min meeting between Sheila and Tom after each weekly meeting	Tom	From start RTW	dd-mm-yyyy

Several stakeholders may be involved in an individual participatory workplace intervention, at least the sick-listed worker, his or her supervisor, and a RTW coordinator or case manager who guides the process. Involvement of coworkers, a representative of the union, or the insurer is also possible. A RTW coordinator should be trained to guide the process of implementation of a workplace intervention (Shaw et al. 2008). A health professional with expertise on the various health problems experienced by the worker is preferred by workers and supervisors (van Oostrom et al. 2007); however, this type of expertise may not be essential to guide a process that takes place in a workplace intervention. Communication and

problem-solving skills might be more important than expertise in health care. Studies show different professionals in the role of RTW coordinator: ergonomists, occupational hygienist, occupational nurses, occupational physicians, company social workers, return-to-work experts, or insurance agents (van Oostrom et al. 2009a).

Due to large differences in legislation and compensation systems between countries, the roles of stakeholders differ and the most appropriate professional to guide a participatory approach may vary. Because of these differences, there is no standard list of recommended stakeholders that should be involved in workplace interventions. Within each jurisdiction,

key stakeholders should be identified in order to implement changes in the workplace.

21.4.1 Types of Work Adjustments

Workplace interventions often result in the implementation of work adjustments at the level of the workstation and at the level of work organization. The participatory approach is an approach used to identify and implement these work adjustments. The following subsections briefly present some examples of changes at the workplace or in the work organization.

21.4.1.1 Workplace Design and Equipment

Interventions for workplace design and equipment are usually directed to the prevention of accidents and injuries and they include the design of ergonomic chairs, new computer devices, and lifting aids. However, several studies have proposed that changes in workplace design and equipment should be implemented at the workplace for RTW purpose (Loisel et al. 1994; Anema et al. 2003; Lambeek et al. 2009; van Oostrom et al. 2009b). For example, in a study about workplace interventions with workers with chronic low back pain, 21% of the RTW solutions were related to equipment design and 6% to workplace design (Lambeek et al. 2009). Examples of the proposed solutions were obtaining a hand-free telephone in order to improve incorrect postures during phone conversations, the provision of a desk lamp to prevent painful eyes because of insufficient light at the workplace, and the use of lifting resources to avoid low back pain. About 36% of the solutions for workers with subacute low back pain are categorized into workplace and equipment design. These solutions have been mostly implemented in the short term, that is, within 3 months (Anema et al. 2003). The proportion of solutions regarding workplace layout or equipment design was much higher in another study among workers with subacute low back pain, namely, 56% (Loisel et al. 1994).

21.4.1.2 Work Organization

Interventions at the work organization level comprise a broad category of solutions. It includes changes in job schedule or tasks, training directed to improve task performance, and also changes in the structure of the social dynamics in the workplace. These interventions are more directed to the prevention of psychosocial strains imposed by the organizational structure and also to facilitate the RTW. At that level changes in the work organization—such as job rotation and task breaks, promotion of communication activities like regular meetings with supervisor and collecting more feedback from supervisor, and training related to time management and skills training—are essential (van Oostrom et al. 2009b). Interventions directed to work organization and workers' training have been frequently applied for workers with low back pain (Anema et al. 2003; Lambeek et al. 2009).

21.5 Effectiveness of Workplace Interventions

A Cochrane systematic review on workplace interventions was published in 2009 (van Oostrom et al. 2009a) and it has been updated for this handbook to include publications up until March 2011. The objective of this review was to determine the effectiveness of workplace interventions in preventing long-term work disability among sick-listed workers, when compared to usual care. All randomized controlled trials (RCTs) concerning workplace interventions aimed at preventing work disability by means of job accommodation or involvement of at least the worker and the employer, as key stakeholders in the RTW process, were described and a meta-analysis was performed. Outcome measures included were time until RTW, cumulative duration of sickness absence, functional status, pain, symptoms, and general health.

The Cochrane review identified six studies evaluating the effectiveness of workplace interventions from European countries, North America, and Canada which met inclusion criteria. Inclusion criteria for the studies in this review were very

strict; only RCTs of workplace interventions aimed at RTW for workers where sickness absence was reported as a continuous outcome were included in the review. The updated literature search (March 2011) revealed three additional publications of European effectiveness studies on workplace interventions (Bultmann et al. 2009; Lambeek et al. 2010; van Oostrom et al. 2010).

21.5.1 Study Populations

The characteristics of the nine studies are presented in Table 21.4. Four studies concerned workers with back pain (Lambeek et al. 2010; Anema et al. 2007; Loisel et al. 1997; Verbeek et al. 2002), one included workers with work-related upper extremity disorders (Feuerstein et al. 2003), two included musculoskeletal disorders in general (Bultmann et al. 2009; Arnetz et al. 2003), and two included mental health problems (van Oostrom et al. 2010; Blonk et al. 2006). The duration of work disability varied largely in the studies; six out of the nine studies focused on sickness absence shorter than 3 months (Bultmann et al. 2009; van Oostrom et al. 2010; Anema et al. 2007; Loisel et al. 1997; Verbeek et al. 2002; Blonk et al. 2006), while two studies included only workers sick listed for more than 3 months (Lambeek et al. 2010; Feuerstein et al. 2003), and this was unclear for the study of Arnetz (Arnetz et al. 2003). One study included self-employed workers only (Blonk et al. 2006). In total seven out of the nine studies concern workers with musculoskeletal disorders; therefore, subgroup analyses for musculoskeletal disorders only are described.

21.5.2 Risk of Bias of Studies

Assessment of risk of bias is an important step in conducting a systematic review and meta-analysis. High-quality studies increase confidence that the effects found are a consequence of the intervention and not due to a suboptimal study design or bias. Ten quality criteria were assessed: adequate sequence generation for randomization, allocation

concealment, blinding of outcome assessor, dropout rate described and acceptable, intention-to-treat analysis performed, free of selective reporting, similar prognostic factors at baseline, co-interventions avoided or similar, compliance acceptable, and timing of the outcome assessment comparable. Studies with more than 5 points on the risk of bias assessment have a low risk of bias. The risk of bias scores of the nine studies is shown in Table 21.5. Only one out of the nine studies scored less than 5 points. It should be remembered that blinding of participants and care providers for the allocation of interventions is often included in the assessment of risk of bias. This is easily arranged in RCTs studying effectiveness of drug medications. Because of the nature of workplace interventions, it is almost impossible to blind participants and care providers, and all of the nine studies studied did not meet the criteria of blinding.

21.5.3 Content of Workplace Interventions

The identified workplace interventions were all directed to RTW of a sick-listed worker but varied largely in their content. Table 21.6 presents information about the content of all workplace interventions. Changes to the workplace and equipment were implemented in all studies, changes of work design and organizations in eight out of nine studies, changes to working conditions in two studies only, and changes in work environment in six studies. Case management with the worker and employer (supervisor) occurred in seven studies. The number of contacts between the worker, the supervisor, and the RTW coordinator during the workplace intervention was often not clear from the publications, but for studies providing this information, it ranged from one to six contacts. Face-to-face contact took place in all studies, mostly at the workplace and in one study at the occupational health service (Verbeek et al. 2002). Table 21.7 presents the different stakeholders involved in the workplace interventions. The worker, the supervisor or employer, and a professional in occupational health were always involved

Table 21.4 Characteristics of the studies on the effectiveness of workplace interventions

Study	Country	Participants	Intervention	Usual care	Outcomes	Duration of follow-up
Anema et al. (2003, 2007), Steenstra et al. (2003)	The Netherlands	196 Sick-listed workers with low back pain	Work site assessment and work adjustments based on methods used in participatory ergonomics	Dutch occupational guideline on low back pain ergonomics	Time until lasting RTW, time until first RTW, cumulative duration of absence, functional status, pain	12 months
Ametz et al. (2003)	Sweden	137 Workers with diagnosed first or recurrent musculoskeletal disorders	Early workplace intervention, adaptation at work, all stakeholders meet at the workplace, ergonomic assessment	Non-standardized treatment: 8-week RTW plan	Cumulative duration of sickness absence	12 months
Blonk et al. (2006)	The Netherlands	122 Workers with adjustment disorders	Brief cognitive behavioral therapy and advice from labor expert directed to lower the workload and job demands and increase the decision latitude	Two brief sessions with general practitioner to check legitimacy of the work disability benefit	Time until first RTW, symptoms	360 days sickness absence, 10 months symptoms
Bultmann et al. (2009)	Denmark	119 Workers on sick leave for 4–12 weeks due to musculoskeletal disorders	Coordinated and tailored work rehabilitation, work disability screening by interdisciplinary team followed by the collaborative development of a RTW plan	Conventional case managements provided by the municipality	Cumulative sickness absence hours, pain, functional disability	12 months
Feuerstein et al. (2003), Shaw et al. (2001)	United States	123 Work-related upper extremity disorder claimants and sick listed for more than 90 days	Quality medical case management, case management plan, work site ergonomic assessment	Usual case management limited to monitoring of the claims process and surveillance of medical treatment	Time until first RTW, functional status, general health status, symptoms	12 months sickness absence, 16-month self-reported outcomes

Lambeek et al. (2007, 2009, 2010)	The Netherlands	134 Adults aged 18–65 sick listed for at least 12 weeks owing to low back pain	Integrated care, workplace intervention based on participatory ergonomics, and a graded activity program based on cognitive behavioral principles	Usual treatment from medical specialist, occupational physician, general practitioner, and/or allied health professionals	Time until lasting RTW, cumulative duration of absence, functional status, pain	12 months
Loisel et al. (1994, 1997, 2002)	Canada	104 Workers with thoracic or lumbar back pain incurred at work, sick listed between 4 weeks and 3 months	Participatory ergonomics evaluation including work site assessment	Treatment from attending physician	Time until first RTW, functional status, pain	12 months
van Oostrom et al. (2008, 2009b, 2010)	The Netherlands	145 Employees with distress, sick listed for 2–8 weeks	Participatory workplace intervention, with the sick-listed employee and supervisor, aimed at reducing obstacles for RTW	Dutch occupational guideline on mental health problems	Time until lasting RTW, cumulative duration of absence, symptoms	12 months
Verbeek et al. (2002), van der Weide et al. (1999)	The Netherlands	120 Workers on sick leave with low back pain for at least 10 days	Occupational physician guideline for low back pain consisting of interventions aimed at removing barriers for return to normal work and advice about modifying the work demands	Medical treatment by general practitioner	Time until first RTW, recurrences, functional status, general health perception, pain	12 months

Table 21.5 Risk of bias scores in the nine studies

	Adequate sequence generation	Allocation concealment	Blinding	Free of selective reporting	Intention-to-treat analysis performed	Co-interventions avoided or similar	Compliance acceptable	Timing of outcome assessments comparable in all groups	Groups similar at baseline regarding important prognostic factors?	Dropout rate described and acceptable?
Anema et al. (2007)	+	+	+	+	+	-	?	+	+	+
Arnetz et al. (2003)	+	-	+	+	+	?	?	+	+	?
Blonk et al. (2006)	+	-	+	+	-	-	?	+	-	?
Bultmann et al. (2009)	+	-	+	+	+	?	?	+	+	+
Feuerstein et al. (2003)	+	?	+	-	-	+	?	+	+	+
Lambeek et al. (2010)	+	+	+	+	+	?	?	+	+	+
Loisel et al. (1997)	?	+	+	+	-	+	?	+	+	+
van Oostrom et al. (2010)	+	+	+	+	+	?	+	+	-	+
Verbeek et al. (2002)	+	+	+	+	+	-	?	+	+	+

+ indicates that the study fits the specific quality criterion, - indicates that the study does not fit the specific quality criterion, ? indicates that it is unclear whether the study fits the specific quality criterion

Table 21.6 Content of the workplace interventions in the nine studies

	Characteristics of the workplace interventions							
	Changes in workplace design or equipment	Changes in work design and organization including working relationships	Changes in working conditions	Changes to the work environment	Case management with worker and employer	Number of meetings	Face-to-face contact	Meeting at the workplace
Anema et al. (2007)	+	+	-	+	+	3	+	+
Arnetz et al. (2003)	+	+	-	-	+	1	+	+
Blonk et al. (2006)	+	+	+	-	-	5-6	+	+
Bultmann et al. (2009)	+	+	-	+	+	2	+	?
Feuerstein et al. (2003)	+		-	+	+	4-5	+	+
Lambeek et al. (2010)	+	+	-	+	+	3	+	+
Loisel et al. (1997)	+	+	+	+	+	?	+	+
van Oostrom et al. (2010)	+	+	-	+	+	3	+	+
Verbeek et al. (2002)	+	+	-	-	-	3	+	-

+ indicates that the study fits the specific intervention characteristic, ? indicates that it is unclear whether the study fits the specific intervention characteristic, - indicates no data

Table 21.7 Stakeholders involved in the workplace interventions in the nine studies

	Stakeholders involved in the workplace interventions						
	Worker	Employer/supervisor	Occupational physician	Occupational nurse	Ergonomist	Representative of union	Representative of insurer
Anema et al. (2007)	+	+	-	+	+	-	-
Arnetz et al. (2003)	+	+	-	-	+	-	+
Blonk et al. (2006)	+	Self-employed	-	-	-	-	+
Bultmann et al. (2009)	+	+	+	+	-	-	-
Feuerstein et al. (2003)	+	+	-	+	-	-	-
Lambeek et al. (2010)	+	+	+	+	-	-	-
Loisel et al. (1997)	+	+	+	-	+	+	-
van Oostrom et al. (2010)	+	+	-	+	-	-	-
Verbeek et al. (2002)	+	+	+	-	-	-	-

+ indicates that the specific stakeholder participated in the workplace intervention, - indicates nonparticipation

in the interventions, except for one study on adjustment disorders where no supervisor was involved (Blonk et al. 2006). Insurer representatives were involved in two studies (Arnetz et al. 2003; Blonk et al. 2006) and union representatives in one study (Loisel et al. 1997).

21.5.4 Outcomes of the Workplace Intervention Studies

The outcomes varied in nine effectiveness studies of workplace interventions. Roughly there are few categories of outcomes that were evaluated: duration of sickness absence or time until RTW, total days of sickness absence, functional status, symptoms, pain, and general health. Not all sickness absence periods are alike in terms of their consequences and a differentiation between short-term and long-term sickness absence is needed (Uegaki et al. 2007). Use of dichotomous outcomes such as work status results in a loss of information because there is no information on the exact duration of work disability and the episodic nature of work disability is neglected. This is especially important when an intervention is focused on RTW. Therefore, for the purpose of this overview, dichotomous sickness absence outcome measures were not included. For the outcome time until RTW, the durability of a RTW may differ. A RTW of 1 day, which means that a worker returned to work and after 1 day there is a new episode of sick leave, can be distinguished from a sustainable RTW. The definition of a sustainable RTW is usually related to national social security legislation systems. For example, in the Netherlands this means a full RTW for a minimum of 4 weeks without recurrences of sick leave. The sickness absence and RTW outcomes will be discussed in the next paragraphs followed by a short summary of the other outcomes.

21.5.4.1 Effects of Workplace Interventions on Time Until Sustainable RTW

Time until a full and sustainable RTW has been evaluated in three Dutch studies (Lambeek et al. 2010; van Oostrom et al. 2010; Anema et al. 2007).

Two studies on low back pain found a reduction of the time until first RTW in favor of the workplace intervention, whereas a study on workers with stress-related health problems found no reduction of the time until first RTW. Anema et al. studied the effectiveness of a workplace intervention for workers who are sick listed for a maximum of 6 weeks with low back pain and found that the median time from the first day of sick leave until RTW was 77 days in the workplace intervention group and 104 days in the usual care group. Time until sustainable RTW significantly favored the workers who participated in the workplace intervention with a hazard ratio of 1.7 (95% CI 1.2–2.4) (Anema et al. 2007). The interpretation of a hazard ratio is not as straightforward as other statistical ratios (e.g., relative risks). A hazard ratio of 1.7 in favor of the workplace intervention suggests that the chances that a worker will return to his work more frequently and quicker than a worker in the usual care condition and, more specific, a worker who has not yet achieved a sustainable RTW by a certain time are 1.7 times more likely to RTW at the next point in time compared with a worker in the usual care condition. Lambeek et al. reported for workers with chronic low back pain a median duration of sick leave (after randomization) of 88 days in the integrated care group (including a workplace intervention) and 208 days in the usual care group (Lambeek et al. 2010). The hazard ratio was 1.9 (95% CI 1.2–2.8).

For sick-listed workers with distress, no favorable results were found in the main analysis, and the median duration of sick leave after randomization was 96 days in the workplace intervention group and 104 days in the usual care group. A hazard ratio of 1.0 (95% CI 0.7–1.4) indicated no effect of the workplace intervention on sustainable RTW (van Oostrom et al. 2010). However, an additional subgroup analysis showed that the workplace intervention significantly reduced the time until sustainable RTW for workers who at baseline intended to RTW despite symptoms. These workers can be classified as the most motivated to RTW since their thoughts and cognitions already assist working despite their symptoms. For these highly motivated workers, a hazard

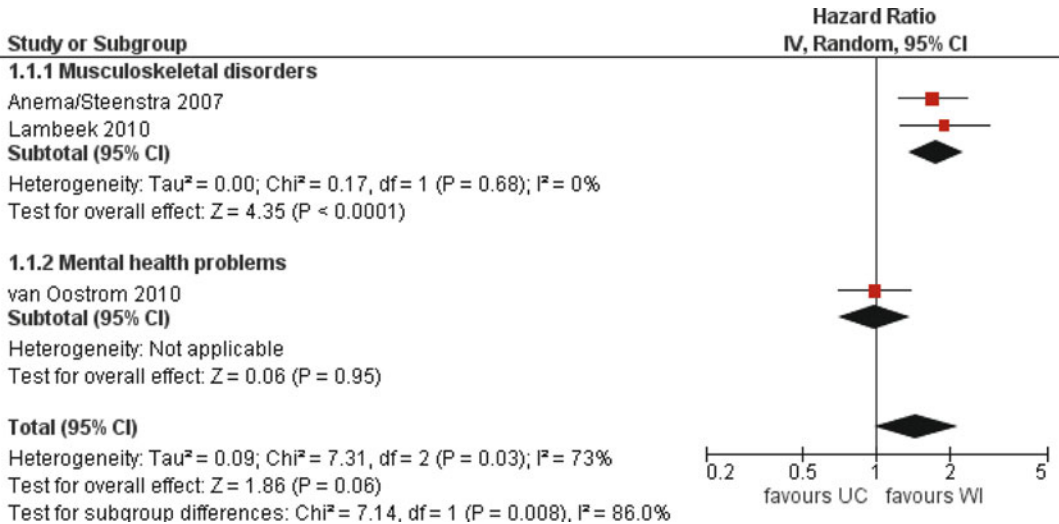


Fig. 21.2 Forest plot for the outcome time until sustainable RTW

ratio of 2.1 (95% CI 1.2–3.5) was found. Workers who beforehand intended to RTW despite symptoms showed a sustainable RTW after 55 days in the workplace intervention group and after 120 days in the usual care group. No such effect of the intervention was found for workers without intentions to RTW despite symptoms at baseline (hazard ratio 0.8, 95% CI 0.5–1.3). Since these last results were based on a subgroup analysis, they should be repeated in another study to confirm these findings.

Figure 21.2 presents a forest plot of three studies pooled together on the outcome time until full and sustainable RTW.¹ By pooling studies on a particular outcome, a forest plot presents the overall effect of workplace interventions for that outcome. The forest plot of time until sustainable

RTW shows that workplace interventions were no more effective than usual care, with a pooled hazard ratio of 1.5 (95% CI 1.0–2.2). A subgroup analysis on the studies on musculoskeletal disorders showed results that favor the workplace intervention with a pooled hazard ratio of 1.8 (95% CI 1.4–2.3).

21.5.4.2 Effects of Workplace Interventions on Time Until First RTW

We identified five studies reporting on the outcome time until first RTW. Three studies found a reduction of the time until first RTW in favor of the workplace intervention (Anema et al. 2007; Loisel et al. 1997; Blonk et al. 2006), and the other two studies did not show a significant difference (Verbeek et al. 2002; Feuerstein et al. 2003).

Workers with low back pain achieved a first RTW in 70 days after the workplace intervention and in 99 days after usual care (Anema et al. 2007). In line with the results for the outcome sustainable RTW, a hazard ratio of 1.7 (95% CI 1.2–2.3) was found. Another study on workers with low back pain also showed that workers who participated in a workplace intervention returned 64 days earlier to their work than workers who received usual care, with a hazard ratio of 1.91

¹A forest plot displays effect estimates and confidence intervals for both individual studies and meta-analyses. Each study is represented by a block at the point estimate of intervention effect with a horizontal line extending either side of the block. The area of the block indicates the weight assigned to that study in the meta-analysis, while the horizontal line depicts the 95% confidence interval. The confidence interval depicts the range of intervention effects compatible with the study's result and indicates whether each was individually statistically significant. Studies with larger weight (larger size of block and usually those with narrower confidence intervals) dominate the calculation of the pooled result.

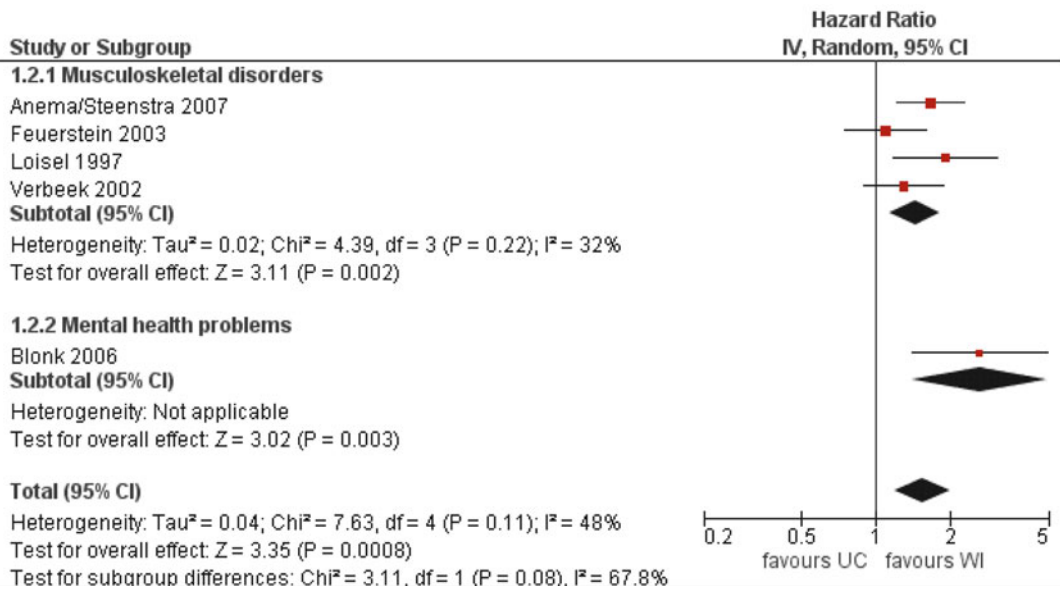


Fig. 21.3 Forest plot for the outcome time until first RTW. Copyright Cochrane Collaboration, reproduced with permission. Van Oostrom, S.H., Driessen, M.T., de Vet, H.C.,

Franche, R.L., Schonstein, E., Loisel, P., et al. (2009). Workplace interventions for preventing work disability. *Cochrane Database of Systematic Reviews*, (2), CD006955

(95% CI 1.2–3.1) (Loisel et al. 1997). Workers with adjustment disorders who took part in a workplace intervention returned to their work after 122 days, while it took 320 days to RTW for those without this intervention (hazard ratio 2.6 [95% CI 1.4–5.0]) (Blonk et al. 2006). The two studies showing no significant difference on the time until first RTW concerned workers with low back pain and work-related upper extremity disorders. The workers with low back pain returned to their work in 51 days after a workplace intervention and in 62 days without this intervention (hazard ratio 1.3 [95% CI 0.9–1.9]) (Verbeek et al. 2002). It took 21 weeks to RTW after the workplace intervention and 23.1 weeks with usual care for workers with work-related upper extremity disorders (hazard ratio 1.1 [95% CI 0.8–1.6]) (Feuerstein et al. 2003). There was a highly noticeable difference in median duration of time until first RTW between the workplace intervention group and the usual care group ranged from 14 to 198 days in these studies.

The forest plot of time until first RTW shows that workplace interventions were more effective than usual care for time until first RTW, with a

pooled hazard ratio of 1.6 (95% CI 1.2–2.0) (Fig. 21.3) (van Oostrom et al. 2009a). Although two individual studies found no significant effect of workplace interventions, the forest plot based on all five studies found a significant hazard ratio in favor of the workplace intervention. The pooled hazard ratio for musculoskeletal disorders was 1.6 (95% CI 1.2–1.8).

21.5.4.3 Effects of Workplace Interventions on Cumulative Sickness Absence Days

Six studies reported cumulative duration of sickness absence, which is defined as the total duration of sick leave for the entire 12-month follow-up of the studies (Bultmann et al. 2009; Lambeek et al. 2010; van Oostrom et al. 2010; Anema et al. 2007; Verbeek et al. 2002; Arnetz et al. 2003). Four out of six studies showed a significant difference in total days of sickness absence during the follow-up. For workers with chronic low back pain, the median number of days of sick leave (including recurrences) during the 12 months of follow-up in the integrated care group was 82 days compared with 175 days in the usual care group

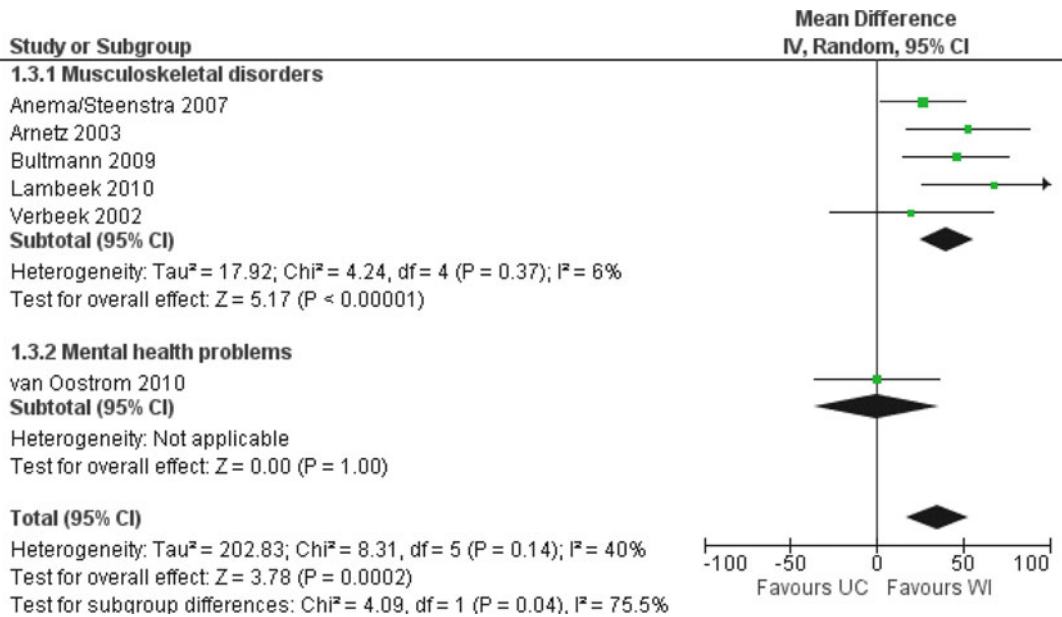


Fig. 21.4 Forest plot for the outcome cumulative sickness absence days

(Lambeek et al. 2010). A difference of a total of 27 days of absence in favor of the workplace intervention is shown for workers with low back pain (Anema et al. 2007). Arnetz and coauthors conducted a study among sick-listed workers with musculoskeletal disorders that showed a significant difference of 53 days in total, again, in favor of the workplace intervention (Arnetz et al. 2003). Another study among workers with musculoskeletal disorders found a lower number of sickness absence hours after a workplace intervention with an average 476 h in the group that received a workplace intervention and 892 h in the control condition (Bultmann et al. 2009). These results are confirmed when evaluated on the short term (0–6 months) and in the long term (6–12 months). However, positive effects of workplace interventions on total days of sickness absence were not supported in one study among workers with low back pain and in one study among workers with distress. Verbeek and coauthors found no significant difference on the total duration of sickness absence in a 1-year follow-up, being 114 days in total for those who took part in a workplace intervention and 134 for those in usual care (Verbeek et al. 2002). The total

number of days of sick leave for workers with distress was 141 days in both groups (van Oostrom et al. 2010).

The forest plot of cumulative sickness absence days shows that workplace interventions were more effective than usual care, with a pooled estimate of 35 days (95% CI 17–53 days) (Fig. 21.4) less sickness absence with the workplace interventions. The pooled estimate for musculoskeletal disorders was 41 days (95% CI 25–56 days) less sickness absence with the workplace interventions.

21.5.4.4 Summary of the Evidence on RTW Outcomes

The evidence on the outcomes, time until first and sustainable RTW, and total days of sickness absence showed positive findings regarding the effectiveness of workplace interventions. The studies from the updated search have confirmed and further strengthened the evidence for effectiveness of workplace interventions for workers with musculoskeletal disorders (van Oostrom et al. 2009a); however, the evidence regarding the effectiveness of workplace interventions for workers with mental health problems is still scarce and

inconsistent. Only two studies addressed workers sick listed due to mental health problems, with one of them showing unclear conclusions. No studies for other health conditions were identified. This means that the positive findings on the effectiveness of workplace interventions to facilitate RTW of workers with musculoskeletal disorders cannot be generalized for now to workers with other health conditions.

21.5.4.5 Effects of Workplace Interventions on Functional Status

All five studies on low back pain and the study on work-related upper extremity disorders evaluated perceived functional status by questionnaire (Bultmann et al. 2009; Lambeek et al. 2010; Anema et al. 2007; Loisel et al. 1997; Verbeek et al. 2002; Feuerstein et al. 2003). Only two studies found a significant difference in functional status (Lambeek et al. 2010; Feuerstein et al. 2003). The other four studies showed that functioning increased within both groups, but there was no difference between the groups at follow-up. Functional limitations due to upper extremity complaints, which were assessed by questioning participants to rate their difficulties performing 12 common daily activities, were also significantly lower among those workers who took part in a workplace intervention than for those receiving usual care.

21.5.4.6 Effects of Workplace Interventions on Symptoms

Regarding pain, five studies on low back pain reported baseline and follow-up values (Bultmann et al. 2009; Lambeek et al. 2010; Anema et al. 2007; Loisel et al. 1997; Verbeek et al. 2002; Feuerstein et al. 2003). All of these studies showed that pain decreased significantly within both groups, but no differences between the workplace intervention and usual care were found. The study on adjustment disorders reported that scores for depression, anxiety, and stress had decreased after 4 and 10 months of follow-up in both groups (Blonk et al. 2006). Oostrom and coauthors also found no differences between the improvements on stress-related symptoms in the

workplace intervention group and the usual care group (van Oostrom et al. 2010). A study on upper extremity disorders showed no difference on upper extremity pain and symptoms (Feuerstein et al. 2003).

21.5.4.7 Effects of Workplace Interventions on General Health

The study on upper extremity disorders and one study on low back pain evaluated the effect of workplace interventions on general health (Verbeek et al. 2002; Feuerstein et al. 2003). For workers with upper extremity disorders, a significant difference between the two groups at 16-month follow-up was found, in favor of the workplace intervention group (Feuerstein et al. 2003).

21.5.4.8 Summary of Evidence on Health-Related Outcomes

In general, workplace interventions were not effective to improve health outcomes among workers with musculoskeletal disorders. The lack of effect on health outcomes may be explained by the focus of a workplace intervention on reducing barriers to RTW and not on symptomatic recovery. RTW seems to be influenced by a worker's ability to function and to adapt to pain rather than through complete resolution of pain and symptoms (Baldwin et al. 2007; Bultmann et al. 2007).

21.6 Working Mechanism of Workplace Interventions

To this date the working mechanism of workplace interventions is largely unknown. By its definition, a workplace intervention carries two important elements: the involvement of relevant stakeholders during the RTW process and the implementation of changes at the workplace and in the work organization. The involvement of relevant stakeholders is crucial for the successful implementation of interventions at the workplace. Applying a workplace intervention without involvement of the sick-listed worker is likely to fail: the real problems of a worker may be easily overlooked and solutions may be suboptimal if there is no support from the worker himself. The supervisor is

also a key player when implementing a workplace intervention. Through personal contact with the worker, knowledge of his or her work activities, and the workers' role in the department, a supervisor can identify additional problems in the work situation from his or her view. He/she can then assess the feasibility of work modifications. Workers and supervisors have often conflicting interests and concerns in the RTW process (Frank et al. 1998). By reaching consensus between them about the work modifications, the support for the intervention implementation is higher. By the commitment of both on a feasible action plan for RTW with clear agreements on responsibility of each, there is a higher chance that the actions will take place in real life.

When workplace interventions are aiming to facilitate RTW for musculoskeletal disorders, it is uncertain whether the provision of work modifications or the communication process leading to these modifications—alone or combined—is effective. In many studies, the number of work modifications or adaptations that is actually implemented is quite low (Loisel et al. 2001; Anema et al. 2003; van Oostrom et al. 2009b; Lambeek et al. 2010); therefore, one can assume that the provision of work adaptations alone cannot be the only effective component. From the analysis of these studies, it was difficult to separate the different components of workplace interventions. We hypothesize that the combination of work modifications or adaptations and structured communication are the crucial components for these interventions effects.

Moreover, it is argued that RTW is accompanied by a behavior change in sick-listed workers. Only few studies explored determinants of the RTW behavior, like attitude to RTW, social support, and self-efficacy to RTW (van Oostrom et al. 2007; Brouwer et al. 2009; Vermeulen et al. 2009). Brouwer et al. found evidence for the relevance of behavioral determinants in predicting the duration of sick leave (Brouwer et al. 2009). This prospective, longitudinal cohort study revealed an association between the work attitude, social support and self-efficacy, and a shorter duration until RTW for employees on long-term sickness absence, which supports the relevance of

behavioral determinants for RTW. For more detailed information we refer to Chap. 10. However, it is not clear whether workplace interventions might impact upon the determinants of RTW behavior. Future studies identifying the most effective working component(s) of workplace interventions are needed.

21.7 Workplace Interventions: Implications for Future Research?

Most studies reported on the effectiveness of workplace interventions for musculoskeletal disorders, and only two studies focused on mental health problems. One reason for the lack of effectiveness studies on health problems other than musculoskeletal disorders may be related to differences in workers' compensation systems. For instance, in the USA, disabled workers can only apply for workers' compensation if they can prove that their health problems are work-related, and mental health problems are not considered for worker's compensation benefits. An important difference between musculoskeletal disorders and mental health problems was the duration of sickness absence until a RTW. Time until RTW in the studies concerning workers with mental health problems was generally longer than in workers with back pain. It seems more difficult to discuss RTW in case of mental health problems, both for supervisors and for health professionals (van Oostrom et al. 2007). Despite a shift towards a more proactive approach for RTW of individuals with mental health problems in the last decade in some countries, it is still more acceptable to RTW after an episode of low back pain than after an episode of mental health problems. A focus group study indicated that culture is a barrier for RTW. In many healthcare environments, the traditional view that employees should take the necessary time to recover completely before they RTW still exists (Oomens et al. 2009). Sometimes workers and supervisors are afraid of a possible increase in stress when a worker with mental health problems RTW in a too early stage. However, studies showed that earlier RTW is not associated with

an increase or decrease in stress-related complaints (Blonk et al. 2006; van der Klink et al. 2003; Bakker et al. 2007; Schene et al. 2006) but is part of the recovery process. A (partial) RTW could assist a worker to regain control of his/her life and to recover more quickly. To overcome possible barriers for a RTW, a participatory workplace intervention seemed a well-suited approach. However, the lack of motivation to RTW and cognitions about being able to work with existent mental health problems seemed important barriers for the success of such an intervention. This is supported by the finding that workers who before a workplace intervention intended to RTW despite stress-related symptoms achieved a sustainable RTW much sooner and frequently than those without this intention (van Oostrom 2010). Elements of cognitive interventions may be additionally needed for these workers to prepare them to RTW. More research is needed into effective strategies to facilitate the relatively long-lasting RTW process of workers with mental health and other health problems.

The studies described in this chapter concern workers with a part-time or full-time permanent work arrangement. The percentage of fixed-term employees without an employment at the labor market increased in the past decade in Europe. This issue has been considered remarkably important in many developing countries where unemployment rates are very high and RTW means also seeking for a new job. Workers without an employment contract are, for instance, temporary agency workers (employed only on a short-term contractual basis), those working in the informal sector (no work registry), and unemployed workers. These workers are at high risk for long-term disability pension (or even long-term disability without a pension) since there is no workplace or employer to return to when sick listed. Vermeulen and colleagues developed a participatory RTW intervention for temporary agency workers and unemployed workers sick listed due to musculoskeletal disorders (Vermeulen et al. 2009), consisting of a stepwise procedure rather similar to the workplace interventions described in this chapter. The intervention aimed at making a consensus-based return-to-work plan with the

possibility of a temporary (therapeutic) workplace. In a RCT, it was shown that the median duration until sustainable first RTW was 161 days in the participatory RTW intervention group, compared to 299 days in the usual care group. The participatory return-to-work program resulted in a significant advantage in RTW rate but only after 90 days of sickness absence (hazard ratio 2.2 [95% CI 1.3–3.9]) (Vermeulen et al. 2011). This study does not fulfill the strict inclusion criteria of the systematic review (update), since a substantial part of the participants was unemployed at the moment of randomization for the study.

21.8 Conclusions and Recommendations

In conclusion, workplace interventions are effective to reduce sickness absence among workers with musculoskeletal disorders when compared to usual care. This conclusion is in line with the Cochrane review that was conducted in 2009, but the updated search confirmed and further strengthened the evidence for workers with musculoskeletal disorders. The literature review presented further showed that evidence for improvements in health outcomes after workplace interventions compared to usual care was not found. This was an expected finding since the focus of a workplace intervention is on reducing barriers to RTW and not on symptomatic recovery. Unfortunately, no conclusions could be drawn regarding interventions for people with mental health problems and other health conditions, owing to a lack of studies.

Workplace interventions are a relatively new approach to reduce or prevent work disability. They seem to be designed to adopt a new paradigm shift, that is, shifting from disease prevention and treatment, with a main focus on symptom recovery, to disability prevention and management, with a main focus on RTW (see also Chaps. 5, 6 and 13).

Although the findings regarding workplace interventions are promising, especially for musculoskeletal disorders, there is still a need for more research in the following areas: (1) identification of the successful feature of workplace interventions and (2) workplace interven-

tions for workers with mental health or other health problems and workers with or without employment contracts.

Healthcare providers, other stakeholders, and policy-makers are recommended to implement workplace interventions to facilitate a RTW for workers with musculoskeletal disorders. Since symptoms, functioning levels, and general health may not improve more than with usual care, all stakeholders in the RTW process (worker, supervisor, healthcare providers, unions, insurers) should agree on a common goal of the workplace intervention, that is, the facilitation of RTW.

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