

Evidence-informed decision about (de-)implementing return-to-work coordination – a case study

Christina Tikka (✉ christina.tikka@ttl.fi)

University of Amsterdam: Universiteit van Amsterdam <https://orcid.org/0000-0003-2078-8715>

Jos Verbeek

Amsterdam UMC Location AMC Coronel Institute for Work and Health: Amsterdam UMC Locatie AMC Coronel Instituut voor Arbeid en Gezondheid

Jan Hoving

Amsterdam UMC Location AMC Coronel Institute for Work and Health: Amsterdam UMC Locatie AMC Coronel Instituut voor Arbeid en Gezondheid

Regina Kunz

University of Basel: Universitat Basel

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Abstract

Background

Coordination of return-to-work (RtW) with the aim to decrease sick leave in many countries. Compared to usual care, a Cochrane review found RtW coordination to have no considerable effect on sick leave. The aim of the study is to find out how the evidence from this review can be used for decisions about (de-)implementing RtW coordination in a country specific setting, using Finland as an example.

Methods

We conducted a systematic literature search and online survey with two groups of experts to collect data on the similarity of RtW interventions in Finland and those evaluated in the Cochrane review. Using content analysis methods we analysed how comparable the interventions in the Cochrane review are to Finish practice. We modelled the costs of RtW coordination compared to usual care for Finland. We used the criteria of the evidence-to-decision framework to draw conclusions about (de-)implementing RtW coordination in Finland.

Results

We included 7 documents from the literature search and received survey data from 10 survey participants. RtW coordination included, both in Finland and in the review, at least one face-to-face meeting between the physician and the worker, a workers' needs assessment, and an individual RtW plan and its implementation. Usual care focuses on medical treatment and may include general RtW advice. RtW coordination would be cost saving if it decreases sick leave with at least two days compared to usual care. The evidence in the Cochrane review was mainly of low certainty and the effect sizes had relatively wide confidence intervals. Only a new, high quality and large RCT can decrease the current uncertainty but this is unlikely to happen. The evidence-to-decision framework did not provide arguments for further implementation nor for de-implementation of the intervention.

Conclusions

Interventions evaluated in the Cochrane review are similar to RtW coordination and usual care interventions in Finland. Considering all EtD framework criteria, including certainty of the evidence and costs, de-implementation of RtW coordination interventions in Finland seems unnecessary. Better evidence about the costs and stakeholders' values regarding RtW coordination is needed to improve decision making.

Background

Sickness absence from work has since long been recognised as a public health problem in many countries (1, 2). Average absence rates in Europe range between 3–6% of working time and are associated with high costs to the society (3). Often the lack of coordination between the many stakeholders involved in the return to work (RtW) process is thought to be the cause for prolonged sick leave (4, 5). Thus, improving communication and collaboration between employer, employee, and occupational health service providers is

a common approach to improve the RtW process and popular in many countries. However, evidence from a Cochrane review could not show a different effect of those interventions on the duration of sick leave compared to usual care (6).

It is unclear how the evidence can be translated to practice and policies. De-implementation studies can show us when to stop investments and distribution of interventions that have been proven inefficient or have been overtaken by more efficient intervention (7, 8). Also, evidence-informed health system and public health recommendations and decisions should consider many factors, such as: the effect of the intervention, how substantial the benefits and harms are, the certainty of the evidence, how much people value the main outcomes, and the cost-effectiveness (9).

It has been shown that, especially when studies do not find beneficial effects of an intervention, practice and setting are perceived different from what is evaluated in studies and results are not translated to practice (10). In the case of Finland, the government considerably invested in the development and implementation of RtW coordination (11, 12), while the Cochrane review could not find a beneficial effect (6), and evidence from Finland was missing in the review.

The disparity between the scientific evidence and occupational health practice in Finland calls for a more detailed analysis, to aid those making evidence-informed recommendations and decisions regarding (de-)implementing RtW coordination interventions.

Methods

The aim is to assess the available evidence and draw conclusions about (de-)implementing RtW coordination in Finland using the evidence-to-decision framework(9). We analyse a) how comparable the interventions in the Cochrane review (6) are to RtW coordination practice in Finland and b) collect and assess the available evidence on RtW coordination intervention in Finland using the criteria listed in the evidence-to-decision framework (9).

We conducted a systematic literature search in PubMed, webpages of Finnish research and government institutes, and reference lists of included studies (Supplemental Table 5). One researcher (CT) screened title and abstract and included any type of publication describing or evaluating interventions to coordinate RtW in Finland and the Cochrane review.

We invited experts on RtW coordination in Finland to participate in an online survey in March and April 2019 using Survey Monkey. We defined experts as a) researchers who participated in the development of a training course on RtW coordination in Finland (13) and b) participants of the training course. Both expert groups were invited via email and reminders were sent after one and two weeks. Participants of the training course were invited one day after the training course by the course coordinator. Participants of the research project were invited by CT. In the survey both expert groups were asked about the difference between RtW coordination and usual care for workers on sick leave in Finland (Supplemental Table 7).

We used content analysis methods to extract and summarize the literature and survey data. Prior to data-extraction, we defined categories (such as content of RtW coordination) and corresponding themes (meetings, workers' needs assessment, RtW plan, implementation management) based on the description of interventions included in the review (Supplemental Table 4). One author (CT) collected data for each category (names, year, setting, participants, content) for RtW coordination and usual care interventions in the review and Finland using Excel.

Data analysis was done independently by two authors (CT and JV). Within each category, authors summarized similarities and differences between RtW coordination in Finland and the review and judged each category as either similar, mostly similar, different, or unclear if data for a comparison was missing. Judgements were compared using Excel and disagreements resolved via discussion.

We applied all criteria from the EtD framework for health system and public health recommendations (9) to draw conclusions about (de-)implementing RtW coordination in Finland.

We compared the costs of sick leave for all workers on long-term sick-leave in Finland with RtW coordination to those without RtW coordination. We used 254 Euro per day for the costs of sick leave in Finland based on the average lost production, including salaries (14, 15) plus personnel costs (16, 17). We calculated the average total sick leave days per worker who has already been on 4 weeks sick-leave as 106 days using statistical data provided by the Finish Social Insurance Institution (KELA) (18).

We calculated the costs of the intervention based on the content of RtW coordination in Finland described by our findings and assumed that a) a basic workers needs' assessment is part of usual care, b) a RtW plan is developed during a RtW coordination meeting and can be directly implemented, c) the RtW coordination meeting is additional to care as usual, d) changes to the plan and evaluation of the implementation are dealt with in follow-up meetings. Therefore, we calculated the costs of RtW coordination as the costs of the meetings without adding the costs for the workers needs assessment or the implementation of the RtW plan. We used an average of 1,5 RtW coordination meetings per worker on sick leave in Finland based on 3-years registry data of a Finnish occupational health service provider (19). We estimated the costs of the intervention at 300 Euro, considering salary costs for one hour for the employer, employee, and physician (20).

For the effect of RtW coordination on sick leave we based our calculation on the effect estimate found by the Cochrane review (Analysis 1.3) (6). The meta-analysis found a statistical non-significant beneficial effect of RtW coordination after 12 months follow up but showed substantial heterogeneity in studies. In our model we used an effect of RtW coordination that was not excluded by the analysis and assumed a reduction of 5 days of annual sick leave per worker on long term sick leave. We used the assumed effect of RtW coordination to calculate the effect that this would have on the costs of sick leave. We updated the literature search from the Cochrane review (6) until 07 March 2019 and included randomised controlled trials that fulfil the inclusion criteria of the review to judge if new studies are available that are likely to change the results of the review.

Results

We included the Cochrane review (6) and six publications that described the content of RtW coordination interventions in Finland. Three publications from Finland were recommendations and part of information and training material (12, 21, 22). Three publications reported empirical data of the content and process of actual RtW coordination interventions in Finland evaluated between 2014 and 2018 (19, 23, 24). The review included 14 randomised controlled trials, conducted in six European countries, Canada, and USA (Supplemental Table 6). For our survey, we invited 39 of 42 eligible participants due to missing contact information. Two participants declined participation. We received responses from 24% (10 of 42).

RtW coordination – Cochrane review vs Finland

We judged RtW coordination and usual care interventions in Finland and those evaluated in the Cochrane review (6) to be mostly similar (Table 1). Coordination of RtW included at least one face-to-face meeting between the physician and the worker, which was often joined by the employer. In these meetings participants discussed the progress of RtW and temporary work accommodations. The workers' needs assessment consisted of an evaluation of the workers' disability and functioning as well as considering factors from the type of work and the workplace. The RtW plan contained goals and multiple actions, such as temporary work accommodations. Goals could be a full or partial RtW or being available for the labour market in other ways. The plan was jointly developed by the health care professionals and the worker, but also other participants could join the development process, such as the employer or the worker's support person. Mostly, the employer or the occupational physician was responsible for implementing the RtW plan and contacting the worker to ensure goals were achieved. The plan could be changed if this were deemed appropriate. In the Cochrane review, interventions always included a workers' needs assessment that focuses on workability and barriers for RtW and an individually tailored RtW plan. According to Finnish recommendations this is very similar to interventions in Finland. However, in practice not all components of the RtW coordination intervention are delivered as intended. Low adherence to the study intervention was described for 2 out of the 14 included trials in the review. Similarly, the survey results showed that in Finland the content of the workers' needs assessment and the RtW plan doesn't always comply with the recommendations and might only include factors that are either related to the individual worker or his workplace (Supplemental Table 7).

Table 1

Similarities and differences between RtW coordination interventions in the Cochrane review and in Finland

Categories	Summary	Judgement
Names	Mostly use of keywords that suggest coordination, only some studies in the review used keywords that did not suggest coordination (such as case management and consultation)	Similar
Setting	Interventions are mostly situated in European welfare states and can start after a long-term sick leave of the worker. In the Cochrane review all workers were at least 4 weeks on sick leave but almost half of the Finnish workers had less than 4 weeks accumulated sick-leave and may not have been on sick leave at the time of the RtW meeting.	Mostly similar
Year(s) studied	Data from different but overlapping timespans ¹ , most studies were recent and conducted after the year 2000	Mostly similar
Participants	No differences: The worker, the employer or a workplace representative, and a physician (most often occupational physician) participate in the intervention. Possibility for other health care providers (such as occupational health nurse or physiotherapist) and other stakeholders (such as occupational safety representative, social worker) to participate in the intervention.	Similar
Content	No differences: Interventions include: - at least one face-to-face meeting between worker and coordinator, which is often but not always joined by the employer. - a workers' needs assessment that includes a focus on employee's work ability. - a collaboratively developed RtW plan which consists of dates, goals, and actions for RtW - one person responsible for the implementation of the RtW plan (evaluating the progress and making changes to the RtW plan if appropriate). In practice the RtW coordination intervention might not always be fully implemented as recommended.	Similar
Intervention duration ²	In the review, interventions lasted 3 months until more than 1 year. Information about the duration of the intervention in Finland was missing.	Unclear
<i>¹ Review data: 18 years (1995–2016), Finland data: 5 years (2014 and 2018); ² defined as from first meeting until last follow-up</i>		

In both the Cochrane review and Finland, the main differences between RtW coordination and usual care were that usual care mostly focuses on medical treatment, does not provide an individual tailored RtW plan and does not include considerations of the work or the workplace (Supplemental Tables 7 and 8). Also, in

usual care the worker may receive general advice to return to work and communication between health care providers is possible.

Effect of the intervention

The review found no beneficial effect on four outcomes across all time points, although some of the confidence intervals around the effects did not exclude a clinically relevant benefit (6). For example, there were no statistically significant effects after 12 months on time to RtW (low-quality evidence), cumulative sickness absence (low quality evidence), the proportion of participants at work at end of the follow-up (low quality evidence), nor on the proportion of participants who had ever returned to work (moderate quality evidence) (Fig. 1). The included evidence does not provide results on the importance of the outcome for participants. We judged that a small decrease in the duration of sick leave might not be relevant to the individual worker but for the employer, especially of small companies and blue-collar workers.

The update of the search strategy from the review identified 2858 references including duplicates. Three studies were eligible for inclusion in the review and included between 98 and 180 participants. One study found a decrease in sick leave by 10 days (25) while two reported no statistically significant effects on RtW (26, 27). Evaluation of the effects of RtW coordination in Finland is available from one uncontrolled before-after study (19) and from our survey of expert opinions. Results from both studies indicated that RtW coordination in Finland increase the number of workers returning to work and decrease the duration of sick leave compared to usual care.

Costs

In Finland there were on average 1.6 meetings per worker receiving RtW coordination (19), which cost on average 480 € per person. The cost analysis shows that the cost for RtW coordination equals the costs of about two days of sick leave (Table 2). A five days reduction of cumulative sick leave would result in 790 € savings, when coordination of RtW is used.

Table 2

Cost analysis of RtW coordination for persons on a long-term sick leave in Finland in 2019 (Euros)

For an average person on > 4 weeks sick leave in Finland				
Item	Number	Costs per unit	Costs Practice as usual (PAU)	Costs PAU plus coordination of RtW
RtW coordination meeting	1.6	300	-	480
Sick leave days	106	254	26 924	26 924
Sick leave days prevented	5	254		-1270
Total costs			26 924	26134
Cost savings	790 (3%)			

Other criteria

To improve the RtW process, the Ministry of Health and Social Affairs in Finland invested in projects that aim to improve the coordination between the many stakeholders involved in the RtW process (11). Further, the Finnish Institute of Occupational Health (FIOH) promotes and provides training courses on how to coordinate the RtW process (12). The intervention is a common intervention by occupational health service providers in Finland (24).

Drawing conclusions based on the EtD framework criteria

Based on the evidence we made a judgement for each of the EtD framework criteria (Table 3).

We judged RtW to be a priority for Finland due to the support of the Ministry and FIOH for RtW coordination. Joined meetings between the employer, employee and occupational health service providers have become a common RtW coordination intervention in Finland but might not be implemented well.

We found the interventions evaluated in the Cochrane review (6) to be similar to those currently implemented in Finland. The systematic review could not show a desirable or undesirable effect of RtW coordination on sick leave compared to usual care. The quality of the evidence of the effect of RtW coordination is of moderate to very low-quality, due to the imprecision of the results and the risk of bias in primary studies. We judged that the results of the review do not exclude a small beneficial effect of coordination of RtW compared to usual care.

A small reduction in the amount of sick leave days per year may not be relevant to workers from the individual perspective. From the population perspective, however, already a small reduction of 5 days of sick leave would reduce the total costs of sick leave.

We judged that the resource requirements of RtW coordination were little in comparison to the costs of sick leave, but that the evidence on benefits and harms was not in favour of the intervention.

Table 3
Evidence to decision framework criteria and judgements for RW coordination in Finland

Criteria	Judgement
Priority of the problem	Long-term sick-leave has an important impact on the worker and the society in terms of productivity. RtW is a recognised priority by policy makers in Finland.
Benefits and harms	RtW coordination compared to usual care does not increase nor decrease the length of sick leave and neither increases the number of workers returning to work.
Certainty of the evidence*	<p>Moderate quality evidence for the outcomes:</p> <ul style="list-style-type: none"> - Cumulative sickness absence in workdays for follow-up of 6 months and more than 12 months - Proportion who had ever returned to work - long-term follow-up: 12 months <p>Low quality evidence for the outcomes:</p> <ul style="list-style-type: none"> - Time to return to work: for follow-up of 6 months, 12 months and more than 12 months - Cumulative sickness absence in workdays -long-term follow-up: 12 months - Proportion who had ever returned to work - very long-term follow-up: more than 12 months - Proportion at work at end of the follow-up - follow-up: 6 months, 12 months, more than 12 months <p>Very low-quality evidence for the outcomes:</p> <ul style="list-style-type: none"> - Proportion who had ever returned to work - short-term follow-up: 6 months
Outcome importance	The included evidence does not provide information on stakeholders' values of a possibly small decrease in the duration of sick leave. Duration of long-term sick leave in Finland lasts on average 106 days. A small decrease by 5 days of sick leave might not be that relevant to the individual worker but for the employer, especially of small companies and blue-collar workers, might be relevant.
Balance between desirable and undesirable effects	Coordination of RtW did not have a desirable or undesirable effect on RtW.
Resource use	
Resource requirements	The analysis of the costs showed that the saving from the reduction of 5 days of sick leave outweigh 1.6 times the cost of RtW coordination.
Certainty of the evidence	The analysis of the costs was done as a brief calculation that may not include all important items of the costs and benefits of RtW coordination, such as the costs of implementing the plan.

Criteria	Judgement
Impact on health equity	Interventions that increase RtW improve the access to the labour market and decrease inequity between healthy and disabled workers. The effect of usual care and RtW coordination on sick leave might be similar.
Acceptability	The intervention is already a common intervention by occupational health service providers in Finland (24). We did not evaluate the attitudes of workers, employers and health service providers towards the intervention.
Feasibility	Our survey showed that the intervention might not be implemented according to the recommendations. We did not evaluate important barriers that would prevent the implementation of RtW coordination in Finland.
* The quality of evidence reflects the extent to which the review authors (6) are confident that an estimate of the effect is correct. (28)	

Discussion

Comparison with other studies

According to some Finnish experts in our survey and the findings from a single before-after study, RtW coordination in Finland is considered effective in increasing the number of workers returning to work and decreasing the duration of sick leave compared to no coordination of care. In contrast to these opinions, the results from the Cochrane review do not show a considerable effect. The review included studies up to 2016 and provided evidence of moderate to very low-quality showing no beneficial effect of RtW coordination on sick leave. New high-quality studies with large sample sizes may change the results. We found three new eligible studies, that could be included in an update of the review. However, based on the study findings and methods used, studies were unlikely to alter the results of the review or the quality of the evidence base.

Our findings of no beneficial effect of RtW coordination is consistent with the findings of multiple other Cochrane reviews that could not find considerable effects of additional clinical interventions on RtW for workers on sick leave compared to usual care (29–33).

Strength and limitations

Routinely collected data on the quality of RtW coordination is missing and publications on RtW interventions usually describe the ideal intervention. Empirical data on what really happens in practice are scarce. We used data from a systematic literature search including grey literature and interviewed experts in a survey to describe the (intended) content and process of the RtW coordination practice in Finland. We compared in detail the current practice in Finland to what has been evaluated in studies in the Cochrane review. We don't think that additional empirical data about Finnish practice would considerably change our conclusions about the similarities and differences between the interventions.

We combined data from different sources and study designs but data on stakeholders' values, attitudes, barriers to implementation of RtW coordination, and costs is either missing or very limited. Future studies that show little support from stakeholders for the intervention could alter our findings and support de-

implementation strategies of RtW coordination. On the other hand, large support from stakeholders could support better implementation of RtW coordination.

Even so we do not know barriers to RtW coordination in Finland, our survey results show that coordination might not be implemented as recommended. Although our survey included a small number of participants and results from bigger studies could alter our findings, it is questionable whether better implementation would achieve a larger decline in sick leave days. Other interventions might be better suited alternatives, such as changes in sickness certification policies or incentives for employers to improve RtW rates of their workers (34). We don't think that additional data about implementation barriers to RtW coordination would considerably change our conclusions.

Our cost analysis indicated cost benefits from RtW coordination if two days of sick leave were averted. A possible small decrease of sick leave might result in meaningful economic consequences important for employers and society.

Conclusion

Our study provides an example on how to make transparent evidence-informed decisions that consider the wider social and political environment. RtW coordination practice in Finland and the interventions in the Cochrane review are similar and the review findings apply to Finland. Considering all EtD framework criteria, including costs and certainty of the evidence, investment in de-implementation strategies or better implementation of RtW coordination interventions in Finland is currently not required.

New studies evaluating the effect and the costs of the intervention based on better quality data would help improve the evidence base. Both would empower decision makers to implement interventions that are clinically and economically worthwhile. We recommend that changes in RtW practices should be implemented as part of a controlled evaluation study, including detailed descriptions of the content of interventions and usual care. New studies need to be sufficiently powerful to detect small but clinically relevant effect sizes, such as two days of reduced sick leave. Given the popularity of RtW coordination, a randomized controlled trial of RtW coordination in Finland would be difficult to realize.

Decision makers can use the EtD framework and its' criteria as a tool to make transparent evidence-based decisions in occupational health and safety. We advise to call for a comprehensive cost-benefit analysis, an assessment of stakeholders' values, and better-quality evidence on the effectiveness of coordination on time to RtW for Finland.

Abbreviations

- RtW: Return to work
- EtD: Evidence to decision
- PAU: Practice as usual
- FIOH: Finish Institute of Occupational Health

Declarations

Ethics approval and consent to participate

Our study included a survey of experts' opinions in Finland. According to the practices of ethical review in human sciences in Finland an ethical approval is not required.

Consent for publication

Not applicable.

Availability of data and materials

The datasets supporting the conclusions of this article are included within the article and its additional files.

Competing Interests

The authors declare no conflict of interests for this article.

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Authors' contributions

The research plan and manuscript were written by CT and JV with substantial contributions from JH and RK. CT and JV designed and conducted the literature search and survey. Data extraction was performed by CT. Data analysis was performed by CT and JV with substantial contributions from JH and RK. Eila Kankaanpää contributed to the cost analysis.

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Supplemental Tables

Supplemental Table 4 Categories and themes for data-extraction and analysis of RtW coordination interventions

Categories	Themes
Name	key words
Content and process	Meetings Workers' needs assessment RtW plan Implementation management RtW plan
Duration	Individual intervention Including follow-up
Setting	Country Place/Location Which phase of sick leave Which year
Participants	Disease of the worker Description of sick leave Involvement of employer (yes/no) Provider (professions of all providers included)
Evaluation	Study design Comparison Number of participants Outcome Analysis method Follow-Up Results

Supplemental Table 5 Search strategy and results April 2019

Cochrane Library, run 18.03.2019			
search	Query	results	included
#1	(Coordination AND return to work [in Title Abstract Keyword]) AND Vogel [in Author]	1	1
PubMed, last run 26.04.2019			
search	Query	results	included
#1	Finnish OR Finland	160023	-
#2	"occupational health"	74442	-
#3	workability OR work-ability OR "work ability" OR "sickness absence" OR sick-leave OR "sick leave" OR sickleave OR "return to work"	18503	-
#4	cooperation OR collaboration OR meeting* OR negotiation* OR coordination	401625	-
#5	#1 AND #2 AND #3 AND #4	17	2
Webpages and snowball principle, last search 29.04.2019			
webpage	provider	results	included
www.uta.fi	University of Tampere	33	4
www.ttl.fi	Finnish Institute of Occupational Health		
www.thl.fi	National Institute for Health and Welfare		
https://stm.fi	Ministry of Social Affairs and Health		

Supplemental Table 6 Key characteristics of included trials in Vogel et. al 2017

14 RCTs that compared return-to-work coordination programmes to usual practice (data from Vogel et al 2017)

Reference ID*	Control intervention¹	Country	Intervention year(s)	Reason for workers sick leave	RtW Outcome(s)
Bültmann 2009	moderate level of support	Denmark	2004-2005	low back pain or musculoskeletal disorders as the main cause of sick leave	cumulative sickness absence, proportion of participants at work at end of the follow-up
Davey 1994	low level of support	Scotland, North-East England	unknown	injuries likely to result in absence from work of 6 months or more	proportion of participants at work at end of the follow-up, proportion of participants who had ever returned to work
Donceel 1999	low level of support	Belgium	1996-1998	surgery for disc herniation	time to return to work, proportion of participants at work at end of the follow-up, proportion of participants who had ever returned to work
Feuertsein 2003	moderate level of support	USA	1999-2002	work-related upper extremity disorder	time to return to work, proportion of participants who had ever returned to work
Jensen 2012	high level of support	Denmark	2004-2009	low back pain	cumulative sickness absence, time to return to work, proportion of participants at work at end of the follow-up, proportion of participants who had ever returned to work
Lambeek 2010	moderate level of support	Netherlands	2005-2008	non-specific chronic low back pain	cumulative sickness absence, time to return to work, proportion of participants who had ever returned to work
Lindh 1997	low level of support	Sweden	not reported	non-specific chronic	proportion of participants at

				musculoskeletal pain	work at end of the follow-up, proportion of participants who had ever returned to work
Myhre 2014	moderate level of support	Norway	2009-2012	neck pain (10%) and low back pain (90%)	cumulative sickness absence, time to return to work, proportion of participants who had ever returned to work
Purdon 2006	low level of support	United Kingdom	2003-2005	any condition likely to result in a 50% chance to return to work (musculoskeletal, mental and behavioural problems, injuries)	proportion of participants at work at end of the follow-up, proportion of participants who had ever returned to work
Rossignol 2000	low level of support	Canada	1995-1997	any work-related injury to the middle or lower vertebral column, not surgery or multiple injuries	time to return to work, proportion of participants who had ever returned to work
Scholz 2015	moderate level of support	Switzerland	2002-2012	severe accidents, occupational and non-occupational	cumulative sickness absence
Stapelfeldt 2011	high level of support	Denmark	2007-2009	low back pain	cumulative sickness absence, time to return to work, proportion of participants who had ever returned to work
Van der Feltz Cornelis 2010	moderate level of support	Netherlands	not reported (3 years)	anxiety, depression, somatoform disorder	time to return to work, proportion of participants at work at end of the follow-up, proportion of participants who had ever returned to work
Volker 2015	moderate level of support	Netherlands	not reported	common mental disorders	cumulative sickness absence, time to return to work, proportion of participants who had ever returned to work

¹ defined by Vogel et al. 2017 as usual practice with low, moderate or high level of support

*Citations to reference IDs: **Bültmann** U, Sherson D, Olsen J, Hansen CL, Lund T, Kilsgaard J. Coordinated and tailored work rehabilitation: a randomized controlled trial with economic evaluation undertaken with workers on sick leave due to musculoskeletal disorders. *Journal of Occupational Rehabilitation* 2009;19(1):81–93.; **Davey** CA. The Implementation and Evaluation of a Rehabilitation Co-ordinator Service for Personal Injury Claimants. Edinburgh: University of Edinburgh, 1994. **Donceel** P, Du Bois M, Lahaye D. Return to work after surgery for lumbar disc herniation. A rehabilitation-oriented approach in insurance medicine. *Spine* 1999;24(9):872–6.; **Feuerstein** M, Huang GD, Ortiz JM, Shaw WS, Miller VI, Wood PM. Integrated case management for work-related upper-extremity disorders: impact of patient satisfaction on health and work status. *Journal of Occupational and Environmental Medicine* 2003;45(8):803–12.; **Jensen** C, Jensen OK, Nielsen CV. Sustainability of return to work in sick-listed employees with low-back pain. Two-year follow-up in a randomized clinical trial comparing multidisciplinary and brief intervention. *BMC Musculoskeletal Disorders* 2012;13:156.; **Lambeek** LC, van Mechelen W, Knol DL, Loisel P, Anema JR. Randomised controlled trial of integrated care to reduce disability from chronic low back pain in working and private life. *BMJ* 2010;340:c1035. [DOI: 10.1136/bmj.c1035]; **Lindh** M, Lurie M, Sann H. A randomized prospective study of vocational outcome in rehabilitation of patients with non-specific musculoskeletal pain: A multidisciplinary approach to patients identified after 90 days of sick-leave. *Scandinavian Journal of Rehabilitation Medicine* 1997;29(2): 103–12.; **Myhre** K, Marchand GH, Leivseth G, Keller A, Bautz-Holter E, Sandvik L, et al. The effect of work-focused rehabilitation among patients with neck and back pain: a randomized controlled trial. *Spine* 2014;39(24):1999–2006.; **Purdon** S, Stratford N, Taylor R, Natarajan L, Bell S, Wittenburg D. Impacts of the job retention and rehabilitation pilot. Leeds: Department for Work and Pensions. 2006. Research Report No 342.; **Rosignol** M, Abenhaim L, Seguin P, Neveu A, Collet JP, Ducruet T, et al. Coordination of primary health care for back pain. A randomized controlled trial. *Spine* 2000;25 (2):251-8; discussion 258-9.; **Scholz** SM, Andermatt P, Tobler BL, Spinnler D. Work incapacity and treatment costs after severe accidents: standard vs. intensive case management in a 6-year randomized controlled trial. *Journal of Occupational Rehabilitation* 2016;26(3):319–31.; **Stapelfeldt** CM, Christiansen DH, Jensen OK, Nielsen CV, Petersen KD, Jensen C. Subgroup analyses on return to work in sick-listed employees with low back pain in a randomised trial comparing brief and multidisciplinary intervention. *BMC Musculoskeletal Disorders* 2011;12:112.; **Van der Feltz-Cornelis** CM, Hoedeman R, de Jong FJ, Meeuwissen JA, Drewes HW, van der Laan NC, et al. Faster return to work after psychiatric consultation for sicklisted employees with common mental disorders compared to care as usual. A randomized clinical trial. *Journal of Neuropsychiatric Disease and Treatment* 2010;6:375–85.; **Volker** D, Zijlstra-Vlasveld MC, Anema JR, Beekman AT, Brouwers EP, Emons WH, et al. Effectiveness of a blended web-based intervention on return to work for sick-listed employees with common mental disorders: results of a cluster randomized controlled trial. *Journal of Medical Internet Research* 2015;17(5):e1116.

Supplemental Table 7 Survey results expert judgements (n=10)

	Survey a (n=6)	Survey b (n=4)	Percentage of all respondents (n=10)
Over the last three years how many workers in Finland, that have been on sick leave for more than 4 weeks, received occupational health negotiations ("työterveysneuvottelu")?			
more than 80%	0	0	0%
at least 50% but less than 80%	3	0	30%
less than 50% but at least 20%	1	1	20%
less than 20%	2	3	50%
Comments	1	0	
Comment 1: Most of the sick leaves of this length end without a need for occupational health negotiation			
What is the difference between the process of occupational health negotiations most commonly conducted in Finland during the last three years (below referred to as usual practice) and the process now described on the e-learning platform "Työterveysneuvottelu-ratkaisuja-työhön" (below referred to as best practice)?			
Best practice does include an assessment of the worker's needs, usual negotiation practice does not.	3	2	50%
Best practice does lead to an individually tailored return-to-work plan directed at the worker, the workplace, and the employer that includes more than one possible action (e.g. treatment and work accommodation), usual negotiation practice does not.	4	2	60%
With best practice the affected worker has at least one joint face-to-face meeting with the occupational physician and the employer/supervisor (and maybe others such as occupational health nurse), in usual negotiation practice the worker has no joint face-to-face meetings with the occupational physician and the employer/supervisor.	1	1	20%
There is no difference between best practice and usual practice for occupational health negotiations in Finland.	0	1	10%
Other (please specify):	0	0	
What is/are the main difference/s between occupational health negotiations and other return-to-work interventions (usual care) in Finland?			
Compared to occupational health negotiations, in most cases, other interventions only focus on treatment and health or work capacity evaluations and an assessment of possible work accommodations is missing.	2	3	50%
In most cases, with other interventions the worker receives no guidance on how to return-to-work, but with occupational health negotiations he does.	3	2	50%
In most cases, with other interventions the advice on how to return-to-work is only general but with occupational health negotiations	4	1	50%

the worker receives an individually tailored return-to-work plan directed at the worker, the workplace, and the employer.			
In most cases, other interventions do not include joined face-to-face meeting(s) with occupational health services and workplace representative, but occupational health negotiations do.	3	3	60%
None of the above.	0	0	0%
Other (please specify):	0	0	0%
Which intervention(s) are more effective?			
All interventions are similar effective in the length of sick leave and the number of workers returning to work	1	1	20%
Occupational health negotiations are more effective than other interventions (worker take shorter sick-leaves and/or more worker return-to-work)	1	4	50%
Occupational health negotiations that fulfil all criteria advocated on the e-learning platform are more effective than occupational health negotiations that don't fulfil all criteria (worker take shorter sick-leaves and/or more people return-to-work)	3	1	40%
Other outcome or statement (please specify) (comments)	2	0	20%
Comment 1: depending on the circumstances (original: "valitaan tilanteen mukaan")			
Comment 2: Effectiveness of the interventions need to be assessed in their own contexts (based on the case in question). It is impossible to compare effectiveness of the different interventions directly. The model provided for ideal intervention on the e-learning platform does not result to shorter sick-leaves and/or more people return-to-work but suggest a smoother negotiation process in the occupational health negotiation and joint decision making concerning RtW.			
Total number of respondents:	6	4	
^a researchers ^b training course participants			

Supplemental Table 8 Description of usual care interventions included in the review by Vogel et al. 2017 according to main aspects of RtW coordination interventions

	Frequency	Participants	Setting	Type (type of contact)	Content
Contact	<u>low level support:</u> no restrictions	<u>low level support:</u> no restrictions - <u>moderate level support:</u> contact to occupational physician, general practitioner and mental health professional, contact to other healthcare professionals not restricted	<u>low level support:</u> no restrictions	<u>low level support:</u> no restrictions - <u>high level support:</u> coordination between stakeholders - <u>moderate level support:</u> multidisciplinary intervention, contact or no personal contact	<u>low level support:</u> no restrictions, - <u>moderate level support:</u> Medical records and return-to-work schedules were sent to participants and their general physician
workers' needs assessment	<u>low level support:</u> no restrictions,	<u>low level support:</u> no restrictions, <u>high level of support</u> by a physician	<u>low level support:</u> no restrictions,	<u>low level support:</u> no restrictions - <u>high level support and moderate level support:</u> standard low back pain or clinical examination -	<u>low level support:</u> no restrictions, <u>moderate level of support:</u> relevant imaging, information about the findings, emphasis on removing fear-avoidance beliefs, restoring activity level, and enhancing self-care and coping" ensure that the patient receives the rehabilitation deemed necessary

					focus on medical care <u>high level of support:</u> clinical examination, relevant imaging and examinations ordered, and treatment options discussed
RtW plan	<u>low level support:</u> no restrictions	<u>low level support:</u> no restrictions	<u>low level support:</u> no restrictions	<u>low level support:</u> no restrictions <u>high level support:</u> advice	<u>low level support:</u> no restrictions, <u>high level of support:</u> to resume work when possible, adjusted medical pain management, physiotherapy <u>moderate level of support:</u> ensure that the patient receives the rehabilitation deemed necessary focus on medical care
Implementation management	<u>low level support:</u> no restrictions	<u>low level support:</u> no restrictions	<u>low level support:</u> no restrictions	<u>low level support:</u> no restrictions <u>moderate level of support:</u> standard management procedure	<u>low level support:</u> no restrictions <u>moderate level of support:</u> focus on handling acute emerging problems and helping with return to work

Figures

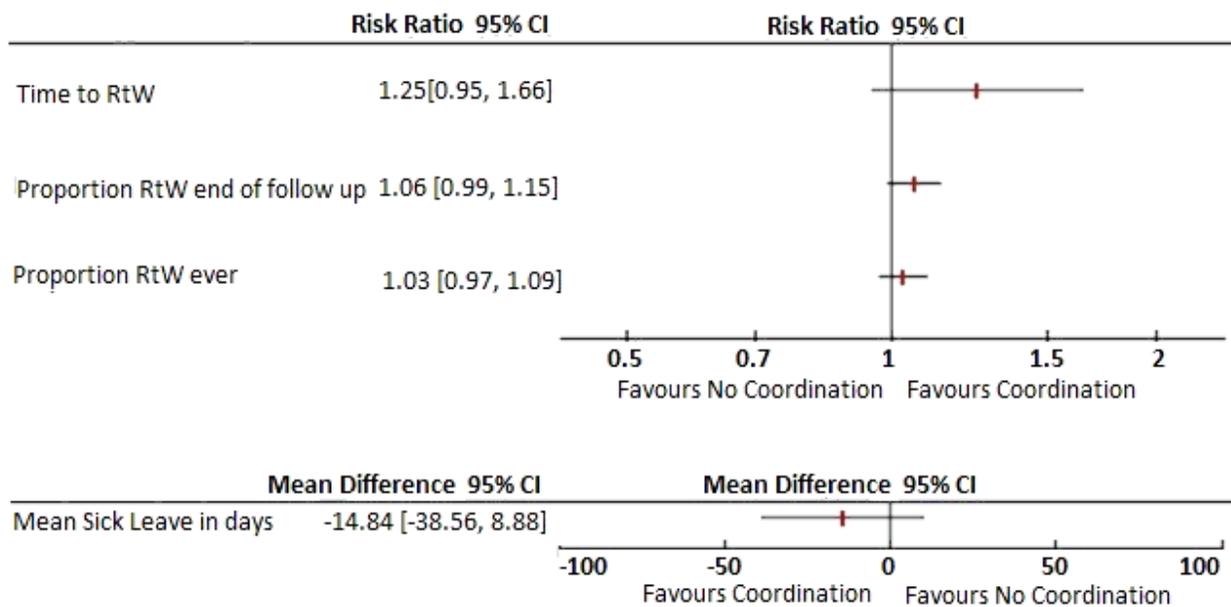


Figure 1

Review results - effect of RtW coordination on sick leave