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# Return-to-work interventions for sick-listed employees with burnout: a systematic review

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## ABSTRACT

Burnout is a work-related mental health problem that often causes long-term sickness absence. Return-to-work (RTW) interventions for burned-out sick-listed employees aim to prevent long-term work disability. This systematic review addresses two questions: (1) Which interventions for burned-out sick-listed employees have been studied?; (2) What is the effect of these interventions on RTW?

We performed a systematic literature review and searched PubMed, Cochrane Central Register of Controlled Trials, Embase, CINAHL and Web of Science from 1 January 2000 to 31 December 2022. We searched for articles of interventions for burned-out sick-listed employees. We conducted the review in line with the Preferred Reporting Items for Systematic Reviews and Meta-Analysis guidelines. Outcome was RTW.

We identified 2160 articles after removal of all duplicates. Eight studies met inclusion criteria. RTW outcomes were number of sick-leave days, sick-leave rates, median period of RTW and worked hours per week. Five studies described person-directed interventions, one described a workplace-directed intervention, one described a combination of both intervention types and one study described all three types of intervention. Only the workplace-directed intervention showed a significant improvement in RTW compared with the comparator group: at 18-month follow-up, 89% of the intervention group had returned to work compared with 73% of the comparator group.

Only a limited number of studies have explored interventions specifically focused on burned-out sick-listed employees and the effect on RTW. Due to heterogeneity and moderate to high risk of bias of these studies, no firm conclusions can be drawn on the described interventions and their effect on RTW. The study was registered with the International prospective register of systematic reviews (PROSPERO, registration number: CRD42018089155).

## INTRODUCTION

Throughout the Organization for Economic Co-operation and Development countries, workers with mental health problems report more sick-leave days per year compared with workers without mental health problems.<sup>1</sup> More than one in six people across European Union (EU) countries had a mental health problem in 2016.<sup>2</sup> Besides the cost for the individual suffering from a mental disorder, the economic costs of mental ill-health for employers and society are high. The International Labour Organization estimates them at 3–4% of gross domestic product in the EU.<sup>3</sup> Healthcare use represents a part of these costs but sickness absence,

## WHAT IS ALREADY KNOWN ON THIS TOPIC

- ⇒ Burnout is a work-related mental health problem that often causes long-term sickness absence.
- ⇒ Previous literature reviews on factors associated with return to work on burnout and on return-to-work interventions for people with burnout show no, inconclusive or only marginal effects on return to work. These literature reviews included a variety of studies regarding study design and participants which may explain the lack of conclusive results.

## WHAT THIS STUDY ADDS

- ⇒ Only a limited number of studies have explored interventions specifically focused on burned-out sick-listed employees and the effect on return to work.
- ⇒ Although these studies target a specific population, heterogeneity of studies (eg, duration of sickness absence before the start of the intervention) remains considerable. This, combined with a moderate to high risk of bias, makes it impossible to draw firm conclusions on interventions and their effect on return to work.

## HOW THIS STUDY MIGHT AFFECT RESEARCH, PRACTICE OR POLICY

- ⇒ Future research should focus on developing well-defined interventions for a specific population (eg, burned-out employees on sick leave less than 6 months). Conducting qualitative feasibility studies will help to understand all factors impacting the effect of the intervention.

reduced productivity at work and unemployment account for the vast majority of these costs.<sup>3</sup>

One of the causes of mental ill-health is burnout. The WHO defines burnout as a syndrome resulting from chronic workplace stress that has not been successfully managed, characterised by three dimensions: feelings of energy depletion or exhaustion; increased mental distance from one's job, or feelings of negativism or cynicism related to one's job; and reduced professional efficacy. The WHO states that burnout refers specifically to phenomena in the occupational context and should not be applied to describe experiences in other areas of life.<sup>4</sup> Burnout affects employees' health and well-being. Burnout is associated with a higher risk of cardiovascular disease,<sup>5 6</sup> type 2 diabetes<sup>7</sup> and job



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dissatisfaction.<sup>8</sup> Furthermore, burnout is associated with an increase of long-term sickness absence<sup>9–11</sup> and permanent work disability.<sup>12</sup> Long-term sickness absence decreases the likelihood to return to work (RTW): the probability of returning to work for those absent between 3 and 6 months is less than 50%. For those absent more than 12 months, the probability is less than 20%.<sup>13</sup> Sick leave due to burnout causes an economic burden on both employers and social security systems. A Dutch study showed that of all kinds of stress-related illnesses, burnout had the longest duration of sick leave (with 313 calendar days and 163 working days), and that one episode of sick leave due to burnout results in an average cost of €30,770 for the employer.<sup>14</sup> Additionally, burnout impacts coworkers of employees suffering from burnout. Burnout is negatively associated with job performance,<sup>15</sup> which may complicate coworkers' tasks and often coworkers will take over tasks of a burned-out employee on sickness absence.

RTW interventions for sick-listed people with burnout may prevent long-term sickness absence and the associated higher risk of not returning to work and economic burden. Therefore, it is important to know which RTW interventions have already been developed and their effect on RTW. Several authors conducted literature reviews on RTW interventions for people with burnout in recent years.<sup>16–20</sup> These reviews vary in terms of (1) study design of included articles: some reviews include experimental studies only, others include observational studies as well; (2) employment of participants: a mixture of self-employed and employees or employees only; (3) sickness absence of participants: some reviews include participants on sick leave, other reviews include both participants on sick leave and at work; (4) outcome measures: improvement in burnout symptoms and/or RTW. These recent literature reviews show no inconclusive or only marginal effects of the described interventions on RTW. A possible reason for these results is heterogeneity of the included studies. In this review, we tackle this heterogeneity of included studies by including only intervention studies with RTW as outcome and where participants are employees on sick leave due to burnout. To meet the objective of this study, finding interventions for sick-listed employees with burnout with a positive impact on RTW, we formulated two questions:

- ▶ Which interventions for sick-listed employees with burnout have already been studied?
- ▶ What is the effect of these interventions on RTW, that is, in terms of number of sick-leave days, sick-leave rates, mean duration of sick leave and worked hours?

## METHODS

### Protocol and registration

This study was conducted and reported following the Preferred Reporting Items for Systematic Reviews and Meta-analyses statement for reporting systematic reviews and meta-analyses.<sup>21</sup> It was registered with the International prospective register of systematic reviews (registration number: CRD42018089155).

### Eligibility criteria

We included randomised controlled trials (RCTs) and non-RCTs describing RTW interventions for employees with burnout. Studies were eligible if participants (1) were between 18 and 65 years old, (2) had paid work as an employee, (3) were on sick leave because of burnout. Studies reporting interventions for self-employed, unemployed or people who perform unpaid work, for example, students or volunteers, were not included. We included studies (1) that described burnout as a work-related

mental (stress) disorder and (2) where participants were not primarily diagnosed with another mental disorder, for example, depression or post-traumatic stress disorder. We included experimental studies that tested different types of interventions: person-directed interventions, workplace-directed interventions and combinations of both intervention types. Studies in English, French and Dutch were included.

### Information sources

We searched PubMed, Cochrane Central Register of Controlled Trials, Embase, CINAHL and Web of Science. The reference lists of all eligible studies were also consulted. We conducted the complete literature search in December 2022. Articles published between January 2000 and December 2022 were included. We included articles from the year 2000 onwards because the number of articles concerning burnout and RTW has steadily increased since then.

### Search strategy

The search strategy was developed in collaboration with a medical librarian and consisted of terms relating to burnout, sick leave and RTW. The full search strategy is available in online supplemental material 1.

### Selection process

Two researchers (CL and SV) screened all references on title and abstract and retrieved the full papers of the references that met eligibility criteria according to at least one of the two reviewers. Next, the same two authors independently screened the full texts. If disagreements could not be resolved by consensus, a third author (LG) was consulted. We used EndNote<sup>22</sup> to remove duplicates from all retrieved references. We used Rayyan QCRI<sup>23</sup> to manage references and to screen titles and abstracts.

### Data extraction

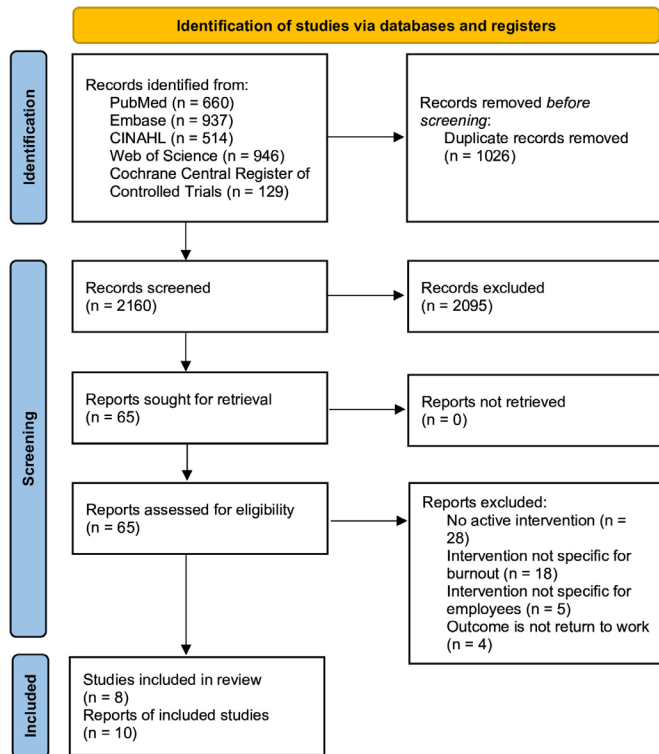
A customised data extraction form was used to extract data from the included studies: research characteristics (authors, year of publication, country of origin, study design), study population (sample size, dropouts, sickness absence duration at baseline), intervention and comparison (type of intervention, comparator, recruitment), follow-up time, outcome measure (sickness absence) and study results. Two researchers independently extracted data (CL and SV). If disagreements could not be resolved by consensus, a third reviewer (LG) was consulted. The data extraction form is available in online supplemental material 2.

### Risk of bias

The same pair of researchers (CL and SV) evaluated the risk of bias of the RCTs by using the RoB 2 tool (ie, a revised Cochrane risk-of-bias tool for randomised trials),<sup>24</sup> while another pair of reviewers (CL and KG) evaluated the risk of bias of the non-RCTs by using the ROBINS-I tool (ie, a Cochrane risk-of-bias tool for non-randomised trials).<sup>25</sup> Robvis was used to visualise the risk of bias results.<sup>26</sup>

### Data analysis

The primary outcome of interest was RTW. No restrictions were applied when it comes to outcome measures (eg, days of sickness absence, sick-leave rates, mean duration of RTW). Due to the heterogeneity across interventions and outcome measures, the findings are presented in a narrative way.



**Figure 1** PRISMA flow diagram. PRISMA, Preferred Reporting Items for Systematic Reviews and Meta-Analyses.

**RESULTS**

**Study selection**

The initial search resulted in 2160 references, duplicates not included. Based on title and abstract, the full text of 65 papers was assessed. In total, 10 papers<sup>27–36</sup> met the inclusion criteria for this review. In two cases, we found a paper describing the short-term effects and a paper describing the long-term effects of the same study population and intervention.<sup>29 30 34 35</sup> Consequently,

the 10 included papers represent 8 different studies. **Figure 1** summarises the study selection process.

**Characteristics of studies**

**Tables 1 and 2** summarise the characteristics of the included studies. More detailed characteristics are available in the data extraction form in online supplemental material 2. Six of the included studies are RCTs,<sup>27 28 31–36</sup> the other two are non-RCTs.<sup>29 30</sup> Five studies were conducted in Sweden,<sup>28–31 33–35</sup> two in the Netherlands<sup>27 32</sup> and one in Denmark.<sup>36</sup> The studies were published between 2008 and 2022.

**Characteristics of study populations**

Overall, participants were sick-listed employees from both private and public sectors, recruited by occupational health services and general practitioners. Two studies<sup>27 32</sup> also used (social) media to recruit participants. One study recruited participants in collaboration with social insurance offices.<sup>29 30</sup> All studies included both male and female participants, except one study<sup>28</sup> which had only female participants. Sample sizes ranged from 24<sup>28</sup> to 152.<sup>33</sup> All participants had at least 25% sickness absence at baseline but the duration of sickness absence at baseline varied between studies: from 2–26 weeks<sup>36</sup> to 1–3 years.<sup>28</sup> One study<sup>32</sup> did not describe duration of sickness absence at baseline.

**Characteristics of interventions**

Included studies varied highly in terms of intervention characteristics (content, last time of follow-up, measures of RTW). Five studies described person-directed interventions, including cognitive-behavioural therapy, light therapy, physical activity, memory training and stress management.<sup>27 31 32 34–36</sup> One study described a workplace-directed intervention (convergence dialogue meeting with the patient and the supervisor)<sup>29 30</sup> and one study described a combined intervention of person-directed and workplace-directed measures.<sup>28</sup> One study described a person-directed intervention, a workplace-directed intervention and a combined intervention<sup>33</sup> and compared these interventions with each other (while the other studies compared the intervention with care as

**Table 1** Characteristics of the included RCTs

Author, year, country	Sickness absence duration prior to the intervention	Follow-up	Intervention(s)	Comparator(s)	Sample size, dropouts	Difference in RTW between intervention(s) and comparator
De Vente <i>et al.</i> <sup>27</sup> 2008, The Netherlands	2 weeks–6 months	10 months	► CBT-based individual SMT ► CBT-based group SMT	Care as usual	n=82, n=20	n.s.
Lindegård <i>et al.</i> <sup>31</sup> 2022, Sweden <sup>31</sup>	<6 months	15 months	Care as usual+individually tailored interventions	Care as usual	n=142, n=7	n.s.
Nieuwenhuijsen <i>et al.</i> <sup>32</sup> 2017, The Netherlands	Not described	6 months	Light therapy/electromagnetic field therapy+coaching	► Not activated light therapy/ electromagnetic field therapy+coaching ► Coaching	n=96, n=12	n.s.
Salomonsson <i>et al.</i> <sup>33</sup> 2020, Sweden	1–6 months	1 year	► CBT ► RTW intervention ► RTW intervention+CBT	Comparison of the interventions with each other	n=152, n=6	n.s.
Stenlund <i>et al.</i> <sup>34 35</sup> 2009+2012, Sweden	3–24 months	2009: 1 year 2012: 3 years	Cognitively oriented behavioural rehabilitation+Qigong	Qigong	2009: n=136, n=43 2012: n=107, n=37	n.s.
Willert <i>et al.</i> <sup>36</sup> 2011, Denmark	2–26 weeks	11 months	Stress management intervention	Wait list	n=61, not described	n.s.

CBT, cognitive-behavioural treatment; n.s., non-significant; RCTs, randomised controlled trials; RTW, return to work; SMT, stress management training.

**Table 2** Characteristics of the included non-RCTs

Author, year, country	Sickness absence duration prior to the intervention	Follow-up	Intervention(s)	Comparator(s)	Sample size, dropouts	Difference in RTW between intervention(s) and comparator
Grossi and Santell, <sup>28</sup> 2009, Sweden	1–3 years	5 years	Care as usual+group rehabilitation programme+individual rehabilitation meetings	Care as usual	n=24, n=0	n.s.
Karlson <i>et al.</i> , <sup>29</sup> 2010+2014, Sweden	2–6 months	2010: 18 months 2014: 30 months	Care as usual+convergence dialogue meeting	Care as usual	2010: n=148, n=18 2014: n=136, n=12	s.

n.s., non-significant; RCTs, randomised controlled trials; RTW, return to work; s., significant.

usual (CAU), wait list or another intervention in the same category as the studied intervention). Last time of follow-up varied between 6 months and 5 years. Studies used different measures of RTW including number of sick-leave days,<sup>27 31 33</sup> sick-leave rates (100%, 75%, 50%, 25%, 0%),<sup>28–30 34 35</sup> median period of RTW<sup>36</sup> and number of worked hours per week.<sup>32</sup>

### Effectiveness of interventions

Person-directed interventions compared with CAU, wait list or another person-directed intervention

Of the five studies describing person-directed interventions,<sup>27 31 32 34–36</sup> two studies compared the intervention with CAU,<sup>27 31</sup> one with wait list<sup>36</sup> and two with another intervention.<sup>32 34 35</sup> None of these studies showed a significant difference in RTW between the intervention and comparator group.

### Workplace-directed intervention compared with CAU

One study described a workplace-directed intervention<sup>29 30</sup> and compared this with CAU. This intervention consisted of a convergence dialogue meeting (a meeting between patient and supervisor to find solutions to facilitate RTW). This is the only included study that found a significant improvement in RTW in the intervention group compared with the comparator group: 89% of the intervention group had returned to work compared with 73% of the control group. However, this result was only found among participants of all ages at 18-month follow-up. At 30-month follow-up, the improvement in RTW was found among participants of 45 years or younger (88.6% vs 69.7%) but not among older participants.

### Combined intervention compared with CAU

One study described a combined intervention and compared it with CAU.<sup>28</sup> This study showed no significant improvement in RTW in the intervention group compared with CAU.

### Person-directed, workplace-directed and combined intervention compared with each other

The study that compared a person-directed, workplace-directed and combined intervention with each other showed no significant difference in RTW between these interventions.<sup>33</sup>

### Risk of bias of the included studies

Figures 2 and 3 show the results of the risk of bias assessment. Four of the eight included studies were assessed as having a high risk of bias,<sup>27 31 32 34 35</sup> the other four as having some concerns.<sup>28–30 33 36</sup> The majority of the studies provided incomplete information to assess the risk of bias on all the domains. For example, none of the studies except one<sup>32</sup> provided information on the trial protocol which leads to a possible risk of

reporting bias. All included RCTs were assessed as having a low risk of bias arising from the randomisation process. Allocation sequences were random and there were no baseline differences between intervention groups that suggested a problem with the randomisation process. Risk of bias in measurement of outcomes was assessed low for all included studies (RCTs and non-RCTs). Sickness absence outcomes were measured using national databases (eg, national social insurance agencies), patient records or diaries. Assessment of risk of bias due to deviations from intended interventions ranged from low to high in included RCTs. In every included RCT (part of), participants were aware of their assigned intervention during the trial. Care providers too were not blinded except in one study.<sup>36</sup> The cause of variety in assessed risk of bias due to deviations from intended interventions lies elsewhere: deviations from the intended intervention that arose because of the trial context, the effect of these deviations on the outcome, used analysis to estimate the effect of assignment to intervention and number of participants who were excluded from the analysis.

### DISCUSSION

A limited number of studies have explored interventions specifically focused on burned-out sick-listed employees and their effect on RTW. This systematic review has three main findings. First, only one of the included studies found a significant improvement in RTW in the intervention group compared with the comparator group. Second, although this literature review tackles heterogeneity of included studies by including only intervention studies with RTW as outcome and where participants

Study	Risk of bias domains					Overall
	D1	D2	D3	D4	D5	
De Vente 2008	+	+	×	+	-	×
Lindegård 2022	+	×	+	+	-	×
Nieuwenhuijsen 2017	+	×	-	+	-	×
Salomonsson 2020	+	-	+	+	-	-
Stenlund 2009/2012*	+	×	×	+	-	×
Willert 2011	+	-	+	+	-	-

**Figure 2** Risk of bias of the randomised controlled trials. RoB 2 tool. Domains: D1: bias arising from the randomisation process; D2: bias due to deviations from intended interventions; D3: bias due to missing outcome data; D4: bias in measurement of the outcome; D5: bias in selection of the reported result. Judgement: ×: high; -: some concerns; +: low. \*D2 was judged as 'some concerns' in Stenlund 2009 and as 'high risk' in Stenlund 2012. In both cases, the overall bias was 'high'.

Study	Risk of bias domains							Overall
	D1	D2	D3	D4	D5	D6	D7	
Grossi 2009	⊖	⊕	⊖	⊕	⊕	⊕	⊖	⊖
Karlson 2010/2014	⊖	⊖	⊖	⊕	⊕	⊕	⊖	⊖

**Figure 3** Risk of bias of the non-randomised controlled trials. ROBINS-I tool. Domains: D1: bias due to confounding; D2: bias due to selection of participants; D3: bias in classification of interventions; D4: bias due to deviations from intended interventions; D5: bias due to missing data; D6: bias in measurement of outcomes; D7: bias in selection of the reported result. Judgement: ⊖: moderate; ⊕: low.

are employees on sick leave due to burnout, heterogeneity of included studies remains considerable. Third, risk of bias of included studies is moderate to high.

There are several possible reasons why we found a limited number of studies in our review. First, we found studies from only three countries: the Netherlands, Sweden and Denmark. A possible explanation lies in one of the inclusion criteria of our study, that is, participants had to be on sick leave because of burnout. The Netherlands, Denmark and Sweden all accept burnout as a reason for sick leave unlike countries where burnout does not justify sick leave, for example, the USA. Second, there is an ongoing debate on the association between burnout and depression. While some authors consider burnout and depression, despite overlapping symptoms, as distinctive constructs,<sup>37</sup> other authors state that burnout can be seen as a form of depression.<sup>38</sup> To define the participants in our review as clearly as possible, we only included studies where burned-out participants were not primarily diagnosed with another mental disorder, for example, depression. This may be another reason why we only found a limited number of studies.

The only included study that found a significant improvement in RTW in the intervention group compared with the control group is a study comparing a convergence dialogue meeting with CAU<sup>29,30</sup> (the convergence dialogue meeting is a meeting between patient and supervisor to find solutions to facilitate RTW). This finding is in line with previous studies suggesting that involvement of the workplace in the RTW process has a positive impact on RTW.<sup>39,40</sup> However, two other studies in this review also incorporate contact with the workplace (individual rehabilitation meeting, graded exposure to the workplace) in their intervention but could not show a difference between the intervention group and comparators.<sup>28,33</sup> This finding in turn is consistent with a Cochrane review showing only low-quality evidence on the effectiveness of workplace interventions on RTW in patients with mental health problems.<sup>41</sup> Besides the studies where involvement of the workplace is integrated in the intervention, two other studies in this review describe a person-directed intervention, but workplace involvement is present in both the intervention group and the comparator group. In one study, employers and colleagues received, on the initiative of the patient, information about the disease and the consequences of the disease for everyday life in both the intervention group and the control group;<sup>31</sup> in the other study, a rehabilitation meeting was organised in both the intervention group and the control group.<sup>34</sup> The lack of a clear distinction between intervention group and controls in terms of potential effective measures to facilitate RTW makes it difficult to draw firm conclusions on which intervention is (most) effective.

The studies in this review not only vary in intervention design but also in study population. The duration of sickness absence

at baseline ranged from 2–24 weeks<sup>36</sup> to 1–3 years.<sup>28</sup> The findings of other studies confirm this variety in duration of sickness absence: a Dutch study showed burnout has duration of sick leave of 313 calendar days<sup>14</sup> and a Slovenian study<sup>42</sup> showed mean duration of sick leave for burnout of only 2–3 months. Since long-term sickness absence decreases RTW rate,<sup>13</sup> duration of sickness absence at the start of an intervention may impact the effect of an intervention.

None of the studies in this review was assessed as having low risk of bias. This is largely caused by the context in which the studies are conducted. Intervention studies with RTW as an outcome need to be carried out in daily practice which often makes it complex to comply to the standards of a ‘low risk of bias’ study. Patients following additional treatments that are not in line with group allocation, dropouts, legal requirements, etc may all increase risk of bias.

The elements discussed above make it difficult to make solid recommendations for daily practice from the findings of our review. However, the finding in our review that a convergence dialogue meeting between patient and supervisor improved RTW is in line with previous research recognising a lack of supervisor support as a barrier for RTW.<sup>42–44</sup> Therefore, investing in training programmes for supervisors and paying attention to their needs when supporting burned-out employees on sick leave can contribute to RTW in daily practice.

### Strengths and limitations

To our knowledge, this is the first systematic review specifically focusing on interventions for sick-listed burned-out employees and their effect on RTW. We conducted a systematic search of the literature from 2000 to 2022 and used well-established tools to assess risk of bias of the included studies. We may have missed studies published before 2000 and since we only included articles in English, French or Dutch, we may have missed publications in other languages.

We did not conduct a meta-analysis because of the diversity of the included studies. The included studies vary in population (duration of sickness absence at baseline), intervention type (person-directed, workplace-directed or combined), comparators (CAU, wait list or another intervention) and outcome measures (number of sick-leave days, sick-leave rates, number of worked hours).

### Further research

First, future studies should make a distinction between patients on short-term sickness absence and patients on long-term sickness absence because long-term sickness absence increases the risk of not returning to work.<sup>9</sup> In addition, further exploration is needed in the above-mentioned ongoing debate on the association between burnout and depression. The lack of a clear understanding of the association between burnout and depression complicates diagnosing burnout correctly which in turn hinders sound scientific research on the duration of sickness absence and the efficacy of RTW interventions for burned-out employees. Furthermore, future research on interventions for sick-listed burned-out employees should try to study well-defined and clearly distinguished interventions without overlap of possible confounding factors in intervention and control group. This is challenging due to the real-life context in which this type of studies is conducted. Therefore, adding qualitative feasibility studies to these intervention studies will contribute to a better understanding of all factors interfering with the intervention.

## CONCLUSION

A limited number of studies have explored interventions specifically focused on burned-out sick-listed employees and their effect on RTW. In this review, we found eight studies that met inclusion criteria. Only one study, describing a workplace-directed intervention, showed a significantly higher RTW rate compared with the comparator group. Heterogeneity of studies in terms of population, intervention type, comparators and outcome measures combined with a moderate to high risk of bias precludes us from drawing firm conclusions on the effect of the studied interventions on RTW.

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**Contributors** CL, SV and LG conceptualised and designed the study. CL and SV reviewed all references for potentially eligible articles and extracted data. CL, SV and KG evaluated the risk of bias of included studies. CL drafted the first manuscript and created the figures and tables. All authors reviewed, revised and approved the final manuscript.

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## Supplementary material 1 – Search Strategy for Studies Included in the Systematic Review Involving Return-to-work Interventions for Employees with Burnout

### Databases

PubMed, Embase, Web of Science, Cochrane Central Register of Controlled Trials, Cinahl

### Language filter

English, French, Dutch

### Time filter

January 1, 2000 – December 31, 2022

### Spatial filter

None

### Search terms per database

#### *PubMed*

##### **Concept 1: Professional burnout**

"Burnout, Professional"[Mesh] OR burnout\*[tiab] OR burn-out\*[tiab] OR exhaustion-disorder\*[tiab] OR work-related-exhaustion[tiab] OR job-related-exhaustion[tiab]

##### **Concept 2: Sick leave or return to work**

"Sick Leave"[Mesh] OR sick-leave\*[tiab] OR medical-leave\*[tiab] OR disability-leave\*[tiab] OR sick-day\*[tiab] OR illness-day\*[tiab] OR "Absenteeism"[Mesh] OR absenteeism[tiab] OR disability-absence\*[tiab] OR sickness-absence\*[tiab] OR work-absence\*[tiab] OR workplace-absence\*[tiab] OR work-disabilit\*[tiab] OR work-incapa\*[tiab] OR absence-from-work[tiab] OR "Return to Work"[Mesh] OR return-to-work[tiab] OR back-to-work[tiab] OR work-resumption[tiab] OR job-resumption[tiab] OR reemploy\*[tiab] OR re-employ\*[tiab] OR job-reentr\*[tiab] OR job-re-entr\*[tiab] OR work-reentr\*[tiab] OR work-re-entr\*[tiab]

#### *Embase*

##### **Concept 1: professional burnout**

'burnout'/exp OR 'burnout\*':ti,ab,kw OR 'burn-out\*':ti,ab,kw OR 'exhaustion disorder\*':ti,ab,kw OR 'work related exhaustion':ti,ab,kw OR 'job related exhaustion':ti,ab,kw

##### **Concept 2: sick leave OR return to work**

'medical leave'/exp OR 'medical leave\*':ti,ab,kw OR 'sick leave\*':ti,ab,kw OR 'disability leave\*':ti,ab,kw OR 'sick day\*':ti,ab,kw OR 'illness day\*':ti,ab,kw OR 'absenteeism'/exp OR 'absenteeism':ti,ab,kw OR 'disability absence\*':ti,ab,kw OR 'sickness absence\*':ti,ab,kw OR 'work absence\*':ti,ab,kw OR 'workplace absence\*':ti,ab,kw OR 'work disability'/exp OR 'work disabilit\*':ti,ab,kw OR 'work incapa\*':ti,ab,kw OR 'absence from work':ti,ab,kw OR 'return to work'/exp OR 'return to work':ti,ab,kw OR 'back to work':ti,ab,kw OR 'work resumption'/exp OR 'work resumption':ti,ab,kw OR 'job resumption':ti,ab,kw OR 'reemploy\*':ti,ab,kw OR 're-employ\*':ti,ab,kw OR 'job reentr\*':ti,ab,kw OR 'job re-entr\*':ti,ab,kw OR 'work reentr\*':ti,ab,kw OR 'work re-entr\*':ti,ab,kw



*Web of Science***Concept 1: professional burnout**

burnout\* OR burn-out\* OR "exhaustion disorder\*" OR "work related exhaustion\*" OR "job related exhaustion\*\*"

**Concept 2: sick leave OR return to work**

"sick leave\*" OR "medical leave\*" OR "disability leave\*" OR "sick day\*" OR "illness day\*" OR absenteeism OR "disability absence\*" OR "sickness absence\*" OR "work absence\*" OR "workplace absence\*" OR "work disability\*" OR "work incapacity\*" OR "absence from work" OR "return to work" OR "back to work" OR "work resumption" OR "job resumption" OR reemploy\* OR re-employ\* OR "job reentr\*" OR "job re-entr\*" OR "work reentr\*" OR "work re-entr\*\*"

*Cochrane***Concept 1: professional burnout**

#1 : [mh "professional burnout"]

#2 : (burnout\* OR burn-out\* OR (exhaustion NEXT disorder\*) OR (work NEXT related NEXT exhaustion\*) OR (job NEXT related NEXT exhaustion\*)):ti,ab,kw

#3 : #1 OR #2

**Concept 2: sick leave OR return to work**

#4 : [mh "sick leave"] OR [mh "absenteeism"] OR [mh "return to work"]

#5 : ((sick NEXT leave\*) OR (medical NEXT leave\*) OR (disability NEXT leave\*) OR (sick NEXT day\*) OR (illness NEXT day\*) OR absenteeism OR (disability NEXT absence\*) OR (sickness NEXT absence\*) OR (work NEXT absence\*) OR (workplace NEXT absence\*) OR (work NEXT disability\*) OR (work NEXT incapacity\*) OR "absence from work" OR "return to work" OR "back to work" OR "work resumption" OR "job resumption" OR reemploy\* OR re-employ\* OR (job NEXT reentr\*) OR (job NEXT re-entr\*) OR (work NEXT reentr\*) OR (work NEXT re-entr\*)):ti,ab,kw

#6 : #4 OR #5

#7: #3 AND #6

*Cinahl***Concept 1: professional burnout**

(MH "Burnout, Professional") OR TI("burnout\*" OR "burn-out\*" OR "exhaustion disorder\*" OR "work related exhaustion\*" OR "job related exhaustion\*\*") OR AB("burnout\*" OR "burn-out\*" OR "exhaustion disorder\*" OR "work related exhaustion\*" OR "job related exhaustion\*\*")

**Concept 2: sick leave OR return to work**

(MH "Sick Leave") OR (MH "Absenteeism") OR (MH "Job Re-Entry")

OR TI("sick leave\*" OR "medical leave\*" OR "disability leave\*" OR "sick day\*" OR "illness day\*" OR "absenteeism" OR "disability absence\*" OR "sickness absence\*" OR "work absence\*" OR "workplace absence\*" OR "work disability\*" OR "work incapacity\*" OR "absence from work" OR "return to work" OR

"back to work" OR "work resumption" OR "job resumption" OR "reemploy\*" OR "re-employ\*" OR "job re-entr\*" OR "job reentr\*" OR "work reentr\*" OR "work re-entr\*")  
OR AB("sick leave\*" OR "medical leave\*" OR "disability leave\*" OR "sick day\*" OR "illness day\*" OR "absenteeism" OR "disability absence\*" OR "sickness absence\*" OR "work absence\*" OR "workplace absence\*" OR "work disability\*" OR "work incapa\*" OR "absence from work" OR "return to work" OR "back to work" OR "work resumption" OR "job resumption" OR "reemploy\*" OR "re-employ\*" OR "job re-entr\*" OR "job reentr\*" OR "work reentr\*" OR "work re-entr\*")

## Supplementary material 2 – Data Extraction Form

Author, Year, Country	Study design	Study population, Recruitment, Follow up	Sickness absence duration at baseline (mean)	Intervention, Comparator (no. of participants allocated), Total sample size	Dropouts per group, total dropouts	Sickness absence outcomes, Results	Statistical significance of the results
De Vente et al, 2008, The Netherlands	RCT	employees in the Netherlands, recruited by occupational health services, general practitioners and by self-referral in reaction to advertisements, 10 months	2 weeks – 6 months (IG 1: 9.59 weeks, IG 2: 8.61 weeks, CG: 8.73 weeks)	IG 1 <sup>a</sup> : individual CBT based SMT (n=28), IG 2 <sup>a</sup> : group CBT based SMT (n=28), CG <sup>a</sup> : care as usual (n=26), n=82	IG 1: n=3, IG 2: n=5, CG: n=12, n=20	-number of days absent (mean) at 4, 7 and 10 months FU IG 1: 63.59, 27.85, 21.73 IG 2: 55.91, 16.88, 18.79 CG: 54.89, 13.50, 14.89 -weeks (mean) until complete work resumption: IG 1: 37 IG 2: 32 CG: 32	n.s.
Lindegård et al, 2022, Sweden	RCT	patients referred by public primary care units, occupational health care centers and private general practitioners to the Institute of Stress Medicine in Gothenburg, Sweden, 15 months	-not longer than 6 months -at least 25% sickness absence at baseline	IG <sup>b</sup> : care as usual + individually tailored interventions (n=71), CG <sup>b</sup> : care as usual (n=71), n=142	IG: n=3, CG: n=4, n=7	number of sick leave days, gross and net, (mean) at 15-month FU: -gross: IG: 390 CG: 389 -net: IG: 332 CG: 306	n.s.
Nieuwenhuijsen et al, 2017, The Netherlands	RCT	employees (age 18-65) from the south of the Netherlands, recruited through social media, newspapers, general practitioners and an occupational health service, 6 months	-not described -at least 50% sickness absence at baseline	IG <sup>c</sup> : light therapy/electromagnetic field therapy + coaching (not described), PG <sup>c</sup> : not activated light therapy/electromagnetic field therapy + coaching (not described), CG <sup>c</sup> : coaching (not described), n=96	not described, n=12	number of worked hours per week at 12 weeks and 24 weeks compared to the number of contract hours in the week prior to the study (median (scores between 0 (no working hours) and 100 (number of contract hours working))): IG: 22.5, 94.7 PG: 14.3, 88.2 CG: 25.0, 62.5	n.s.
Salomonsson et al, 2020, Sweden	RCT	primary care patients (age 18-65) in Stockholm County, Sweden,	1 – 6 months (IG: 53.7 days, CG 1: 57.7 days, CG 2: 54.3)	Stress subgroup: IG 1: CBT (n=52), IG 2 <sup>d</sup> : RTW-I (n=49), IG 3 <sup>d</sup> : CBT + RTW-I (n=51),	n=6	number of days on sick leave one year after treatment start (mean) Stress subgroup: IG:	n.s.

		recruited by general practitioners of four primary care centers, 1 year		n=152		136.5 CG 1: 132.1 CG 2: 147.8	
Stenlund et al, 2009, Sweden	RCT	patients (age 25-55) referred by general practitioners to the Stress Clinic of Umea, Sweden, 1 year	3 – 24 months (IG: 326 days, CG: 344)	IG <sup>o</sup> : CBR + Qigong (n=67), CG <sup>o</sup> : Qigong (n=69), n=136	IG: n=13, CG: n=30, n=43	sick leave rate (100%, 75%, 50%, 25%, 0%) measured at 12-month FU: IG: 39%, 9%, 21%, 4%, 28% CG: 37%, 10%, 24%, 6%, 22%	n.s.
Stenlund et al, 2012, Sweden	RCT	patients (age 25-55) referred by general practitioners to the Stress Clinic of Umea, Sweden, 3 years	3 – 24 months (IG: 326 days, CG: 344)	IG <sup>o</sup> : CBR + Qigong (n=58), CG <sup>o</sup> : Qigong (n=49), n=107	IG: n=9, CG: n=28, n=37	full-time sick leave rate at 36-month FU: IG: 25% CG: 25%	n.s.
Willert et al, 2011, Denmark	RCT	persons from the working population (age 18-67) in the municipality of Aarhus, Sweden, recruited by general practitioners, union social workers and direct inquiry, 11 months	2 – 26 weeks (IG: 14.5 weeks, CG: 16 weeks)	IG: stress management intervention (n=29), CG: wait list (n=32), n=61 (subgroup on sick leave)	not described for subgroup on sick leave	median period of return to work: IG: week 16 CG: week 33	n.s.
Grossi et al, 2009, Sweden	quasi-experimental study	women, sick-listed by the municipal company health center in Eskilstuna, Sweden, 5 years	1 – 3 years (IG: 1.9 years, CG: 1.7 years)	IG <sup>o</sup> : care as usual + group rehabilitation programme + individual rehabilitation meetings (n=12), CG <sup>o</sup> : care as usual (n=12), n=24	n=0	sick leave rate (100%, 75%, 50%, 25%) measured at 15-month FU (n): IG: 0,1,0,0 CG: 0,0,0,0	n.s.
Karlson et al, 2010, Sweden	prospective controlled study	sick-listed employed people, recruited in co-operation with regional social insurance offices in the two southern counties of Sweden, 18 months	2 – 6 months	IG <sup>o</sup> : care as usual + convergence dialogue meeting (n=92), CG <sup>o</sup> : care as usual (n=74), n=166	IG: n=18, CG: n=0, n=18	sick leave rate (100%, 75%, 50%, 25%, 0%) measured at 18-month FU: IG: 10.8%, 2.7%, 16.2%, 6.8%, 63.5% CG: 27%, 0%, 5.4%, 5.4%, 4.1%, 63.5%	s.

Karlson et al, 2014, Sweden	prospective controlled study	sick-listed employed people, recruited in co-operation with regional social insurance offices in the two southern counties of Sweden, 30 months	2 – 6 months	<u>IG</u> <sup>h</sup> : care as usual + convergence dialogue meeting (n=74), <u>CG</u> <sup>h</sup> : care as usual (n=74), n=148	<u>IG</u> : n=6, <u>CG</u> : n=6, n=12	sick leave rate (100%, 75%, 50%, 25%, 0%) measured at 30-month FU: -Participants of 45 years or younger: <u>IG</u> : 11.4%, 0%, 2.9%, 2.9%, 82.9% <u>CG</u> : 30.3%, 0%, 0%, 0%, 69.7% -Participants of 46 years or older: <u>IG</u> : 24.2%, 0%, 15.2%, 6.1%, 54.5% <u>CG</u> : 14.3%, 0%, 8.6%, 0%, 77.1%	-Participants of 45 years or younger: s. -Participants of 46 years or older: n.s.
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IG: intervention group, CG: comparator group, PG: placebo group, CBT: cognitive behavioral treatment, SMT: stress management training, CBR: cognitively oriented behavioral rehabilitation RTW-I: return-to-work intervention, PTSS: posttraumatic stress disorder, OCD: obsessive compulsive stress disorder, AD: adjustment disorder, ED: exhaustion disorder, n.s.: non-significant, s.: significant