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[Intervention Review]

Health-improving interventions for obtaining employment in unemployed job seekers

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ABSTRACT

Background

Unemployment is associated with decreased health which may be a reason or a consequence of becoming unemployed. Decreased health can inhibit re-employment.

Objectives

To assess the effectiveness of health-improving interventions for obtaining employment in unemployed job seekers.

Search methods

We searched (3 May 2018, updated 13 August 2019) the Cochrane Central Register of Controlled Trials, MEDLINE, Scopus, PsycINFO, CINAHL, SocINDEX, OSH Update, ClinicalTrials.gov, the WHO trials portal, and also reference lists of included studies and selected reviews.

Selection criteria

We included randomised controlled trials (RCTs) of the effectiveness of health-improving interventions for obtaining employment in unemployed job seekers. The primary outcome was re-employment reported as the number or percentage of participants who obtained employment. Our secondary outcomes were health and work ability.

Data collection and analysis

Two authors independently screened studies, extracted outcome data, and assessed risk of bias. We pooled study results with random-effect models and reported risk ratios (RRs) with 95% confidence intervals (CIs) and assessed the overall quality of the evidence for each comparison using the GRADE approach.

Main results

We included 15 randomised controlled trials (16 interventions) with a total of 6397 unemployed participants. Eight studies evaluated therapeutic interventions such as cognitive behavioural therapy, physical exercise, and health-related advice and counselling and, in seven studies, interventions were combined using therapeutic methods and job-search training.

Therapeutic interventions

Therapeutic interventions compared to no intervention may increase employment at an average of 11 months follow-up but the evidence is very uncertain (RR = 1.41, 95% CI 1.07 to 1.87, n = 1142, 8 studies with 9 interventions, $I^2 = 52\%$, very low-quality evidence). There is probably no difference in the effects of therapeutic interventions compared to no intervention on mental health (SMD 0.12, 95% CI -0.06 to 0.29, n = 530, 2 studies, low-quality evidence) and on general health (SMD 0.19, 95% CI -0.04 to 0.41, n = 318, 1 study, moderate-quality evidence).

Combined interventions

Combined interventions probably increase employment slightly compared to no intervention at an average of 10 months follow-up (RR 1.12, 95% CI 1.06 to 1.20, n = 4101, 6 studies, $I^2 = 7\%$).

There were no studies that measured work-ability, adverse events, or cost-effectiveness.

Authors' conclusions

Interventions combining therapeutic methods and job-search training probably have a small beneficial effect in increasing employment. Therapeutic interventions may have an effect on re-employment, but we are very uncertain. Therapeutic interventions may not improve health in unemployed job seekers. Large high-quality RCTs targeting short-term or long-term unemployed people are needed to increase the quality of the evidence. A cost-effectiveness assessment is needed of the small beneficial effects.

PLAIN LANGUAGE SUMMARY

Health-improving interventions helping unemployed job seekers to get a job

What is the aim of this review?

The aim of this Cochrane review was to find out if it is possible to help unemployed people to get a job by improving their health.

Decreased health and declined work ability may be reasons for becoming unemployed. Also, unemployment, and especially prolonged unemployment, may in turn cause poor health and well-being. It is not known if unemployed people could be helped to get a job by interventions that improve health.

Key messages

Interventions that combine therapeutic methods and job-search training probably slightly increase the number of unemployed people who get a job compared to those who have no intervention. To increase the certainty of the evidence, we still need more high-quality studies, including studies where interventions are clearly targeted for short-term or long-term unemployed.

What was studied in the review?

We included 15 randomised controlled trials involving 6397 participants. Interventions included therapeutic methods such as cognitive behavioural therapy, physical exercise, and health-related advice and counselling, or they were combined interventions that included therapeutics and job-search training. We used the data from these studies about the number of unemployed participants who obtained a job. We also collected data about general and mental health. There were no studies that reported work ability outcomes.

Results showed that combined interventions (therapeutic interventions combined with job-search training) probably slightly increase the number of unemployed people who get a job compared to those who do not follow an intervention. Therapeutic interventions may increase the number of unemployed people who get a job compared to those who do not follow an intervention but the evidence is very uncertain. Therapeutic interventions probably make no difference to mental and general health compared to no intervention.

How up to date is this review?

We searched for studies that had been published up to August 2019.

SUMMARY OF FINDINGS

Summary of findings for the main comparison. Therapeutic interventions compared to no intervention

Therapeutic interventions compared to no intervention

Patient or population: Unemployed job seekers

Setting: Various settings

Intervention: Therapeutic intervention

Comparison: No intervention

Outcomes	Anticipated absolute effects* (95% CI)		Relative effect (95% CI)	Nº of participants (studies)	Certainty of the evidence (GRADE)
	Risk with no intervention	Risk with therapeutic interventions			
Re-employment Measured as percentage or number of participants who obtained paid employment Follow-up: Mean 11 months (from 4 to 36 months)	294 per 1 000	415 per 1 000 (315 to 551)	RR 1.41 (1.07 to 1.87)	1142 (8 RCTs)	⊕⊕⊕⊕ VERY LOW ^{1 2}
General health Measured with Short Form-36 Health Survey (SF-36) (higher score indicating better mental health)		SMD 0.19 higher (0.04 lower to 0.41 higher)	-	318 (1 RCT)	⊕⊕⊕⊕ MODERATE ³
Mental health Measured with SF-36 and General Health Questionnaire (GHQ) (higher score indicating better mental health)		SMD 0.12 higher (0.06 lower to 0.29 higher)	-	530 (2 RCTs)	⊕⊕⊕⊕ LOW ^{3 4}

***The risk in the intervention group** (and its 95% confidence interval) is based on the assumed risk in the comparison group and the **relative effect** of the intervention (and its 95% CI).

CI: Confidence interval; **RR:** Risk ratio; **OR:** Odds ratio;

GRADE Working Group grades of evidence

High certainty: We are very confident that the true effect lies close to that of the estimate of the effect

Moderate certainty: We are moderately confident in the effect estimate: The true effect is likely to be close to the estimate of the effect, but there is a possibility that it is substantially different

Low certainty: Our confidence in the effect estimate is limited: The true effect may be substantially different from the estimate of the effect
Very low certainty: We have very little confidence in the effect estimate: The true effect is likely to be substantially different from the estimate of effect

- ¹ We downgraded one level because of limitations (lack of allocation concealment and blinding of participants and personnel).
- ² We downgraded two levels because of substantial heterogeneity.
- ³ We downgraded one level because of imprecision.
- ⁴ We downgraded one level because of limitations (lack of blinding of participants and personnel and incomplete outcome data).

Summary of findings 2. Combined interventions compared to no intervention

Combined interventions compared to no intervention

Patient or population: Unemployed job seekers

Setting: Various settings

Intervention: Combined interventions

Comparison: No intervention

Outcomes	Anticipated absolute effects* (95% CI)		Relative effect (95% CI)	Nº of participants (studies)	Certainty of the evidence (GRADE)
	Risk with no intervention	Risk with Combined interventions			
Re-employment Measured as percentage or number of participants who obtained paid employment Follow-up: Mean 10 months (from 4 to 24 months)	498 per 1 000	557 per 1 000 (528 to 597)	RR 1.12 (1.06 to 1.20)	4101 (6 RCTs)	⊕⊕⊕⊖ MODERATE ¹
Re-employment Measured as percentage or number of participants who obtained paid employment Follow-up: 2 months	529 per 1 000	625 per 1 000 (413 to 948)	RR 1.18 (0.78 to 1.79)	66 (1 RCT)	⊕⊖⊖⊖ VERY LOW ²

***The risk in the intervention group** (and its 95% confidence interval) is based on the assumed risk in the comparison group and the **relative effect** of the intervention (and its 95% CI).

CI: Confidence interval; **RR:** Risk ratio; **OR:** Odds ratio;

GRADE Working Group grades of evidence

High certainty: We are very confident that the true effect lies close to that of the estimate of the effect

Moderate certainty: We are moderately confident in the effect estimate: The true effect is likely to be close to the estimate of the effect, but there is a possibility that it is substantially different

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Very low certainty: We have very little confidence in the effect estimate: The true effect is likely to be substantially different from the estimate of effect

¹ We downgraded one level because of limitations in studies (lack of blinding participants and personnel).

² We downgraded two levels because of imprecision (one study with small number of participants and wide CIs).

BACKGROUND

Description of the condition

Unemployment is associated with deterioration in health, well-being and quality of life, and this association is significant even in countries with relatively generous unemployment protection systems (Norström 2019; Stauder 2019). Research evidence indicates that morbidity and mortality risks are higher among the unemployed compared to the employed population (Brüning 2019). The unemployed form a very heterogeneous group, however, various demographic and social factors may moderate the negative effects of unemployment on health and well-being. Such factors include educational level, former employment status, gender, marital status, social relations, and financial situation. The groups of unemployed who are most at risk of health loss are the ageing and the long-term unemployed (Griep 2016).

The relationship between poor health and unemployment is reciprocal. There is evidence of a selection process for unemployment, but unemployment also has a detrimental effect on health. According to the selection hypothesis, workers with poor health, mental health problems, chronic diseases, and decreased work ability are more likely to drift into unemployment due to being laid off or unsuccessful attempts at re-employment (Salm 2009; Schuring 2013; Van Rijn 2014; Virtanen 2013; Wagenaar 2015). Selection for unemployment due to poor health has a greater effect on less educated workers (Schuring 2013). Once unemployed, job seekers with poor health are less likely to find employment than job seekers who are in better health (Schuring 2013; Virtanen 2013; Wagenaar 2015).

Evidence indicates also that unemployment has a detrimental effect on an individual's physical and mental health and work ability (Gebel 2014; Lundin 2016; Stauder 2019). A decrease in health can be explained by depression and distress, as well as by physically harmful behaviours, such as following an unhealthy diet, risky levels of alcohol use, and smoking, all of which are associated with unemployment (Al-Sudani 2016; Boden 2017; Gabrys 2013). These behaviours may be part of the person's strategy for coping with the stress of unemployment, while in their turn, they can contribute to the emergence of chronic illnesses (Rosenthal 2012). When unemployment is prolonged, there are often concomitant health problems such as musculoskeletal pain, sub-optimal sensory functioning and poorer sleep quality, and an increase in smoking and risky levels of alcohol consumption (Virtanen 2013).

Description of the intervention

Given that unemployment is related to poor health, a precondition for prospective re-employment is restoration of the unemployed person's employability, health, self-esteem and work ability (Brussig 2014). A well-established finding is that unemployed job seekers with good health and work ability are most likely to find work (Wagenaar 2015). However, active labour market programmes, that aim to improve the supply of labour by linking the receipt of social security to return-to-work interventions, are mainly based on developing specific work-related and job-seeking skills (Sage 2015; Voßemer 2018). These interventions are not aimed at enhancing health and well-being, and so have only very minor benefits in these areas, if any (Reine 2011; Sage 2015). This review therefore assessed interventions that are specifically

aimed at improving the prospects for re-employment by promoting health.

Health-improving interventions are carried out by diverse actors within an extensive health sector (Zaiss 2018). When health interventions are targeted at unemployed job seekers, several stakeholders can be involved. The international classification of health interventions by the World Health Organization (WHO) describes interventions as diagnostic, therapeutic, managing and preventing interventions (Zaiss 2018). Therapeutic interventions target body systems and functions, such as mental health or the musculoskeletal system (Koopman 2017), activities and participation, interpersonal interactions, and health-related behaviours at the individual level (ICHI 2019). With respect to the objectives of this review, we assessed methods used in therapeutic interventions (ICHI 2019) and interventions that combined therapeutics and work-related measures.

How the intervention might work

The ultimate aim of health promotion is to empower people to take control over their own health and improve it (WHO 1986). Perceptions of satisfactory general health status, stable and positive psychological well-being and self-esteem, and good physical condition and functioning can help unemployed job seekers to be more competitive in the labour market and to succeed in obtaining a job (Brussig 2014). Health interventions are often complex, involving several stakeholders and different methods may be applied in one intervention.

Therapeutic interventions target body systems and functions (ICHI 2019). Therapeutic interventions may include diagnostic methods such as assessments, measurements, and tests to examine health status and to assess the effects of an intervention. Therapeutic methods consist of assisting or leading exercises that support or guide regular use of an activity, such as cognitive or physical exercise, training (teaching, enhancing or developing skills), or education (providing structured information in a manner conducive to improving knowledge about matters relevant to health). Also, advising (recommending a course of action in relation to changing or maintaining functioning or behaviour) or counselling (which is provided as therapeutic or supportive communication, such as health coaching) are used. Treatment can include psychotherapy (a systematic application of psychological theory), or practical support (assistance or guidance to facilitate activities or emotional support that is motivational and empathic). One example of therapeutic interventions is learning to handle and reduce stress caused by unemployment (Rosenthal 2012). Another is resilience training aiming to reduce depressive symptoms (Koopman 2017) and to increase motivation and level of functioning, and thus help in job-seeking.

Combined interventions use therapeutic methods alongside job-search training. Job-search training includes tasks about learning and practicing job-seeking skills such as inventing one's competencies and qualifications, filling job applications, and succeeding in a job interview. Job-search training methods are, for example, active learning processes by group activation, discussions of role playing, and support provided by trainer and peers. In the Eden (Eden 1993) study, psychological support aimed at boosting self-efficacy and self-esteem while video clips showed successful job-search behaviours followed by discussion and role-playing in

small groups. Encouragement was provided by the trainer and peers.

Why it is important to do this review

Studies suggest that re-employment, even with a temporary contract (Gebel 2014), improves self-rated health and quality of life (Carlier 2013; Schuring 2011), psychological well-being (Ferreira 2015; Gebel 2014; Schuring 2011), and physical and social functioning, vitality, physical pain and role limitations caused by health problems (Schuring 2011). Improvement of employment status for unemployed persons brings about several well-being benefits, and helps to overcome health inequalities between the unemployed and the employed.

Whether it is a cause of unemployment or a consequence of it, poor health can greatly increase the difficulty of finding work. Therefore, health promotion measures should be offered to unemployed job seekers to help improve their prospects for re-employment. To date, however, studies evaluating such interventions have not been brought together and condensed in a Cochrane systematic review that would provide a coherent overview of their findings.

Of the relevant earlier systematic reviews that have been done, some have assessed the effectiveness of interventions aimed at improving the health and re-employment prospects of unemployed job seekers. For example, one review assessed the effectiveness of vocational interventions on re-employment and mental health (Audhoe 2010), while another presented findings on job-search interventions in promoting employment (Liu 2014). The effectiveness of interventions that are targeted at improving mental health has recently been evaluated (Koopman 2017), as has the effectiveness of interventions aimed at job seekers with severe mental illness (Suijkerbuijk 2017). However, none of these reviews assessed the effectiveness of interventions aimed at promoting general health. Therefore, it is important to study interventions that might improve the health of the unemployed in order to support their employment prospects.

OBJECTIVES

To assess the effectiveness of health-improving interventions for obtaining employment in unemployed job seekers.

METHODS

Criteria for considering studies for this review

Types of studies

We included randomised controlled trials (RCTs). We included peer-reviewed studies reported as full text, those published in abstract form only and unpublished data. We also intended to include non-randomised studies because we anticipated that no or few RCTs would be available. Because we found sufficient RCTs, we did not include non-randomised studies (See [Differences between protocol and review](#)).

Types of participants

We included studies conducted with unemployed adult persons aged 16 or above who were without a paid job but available to work. We excluded studies that were focused on other groups than the unemployed and on one type of patient group only (e.g. severe mental illness).

Types of interventions

We included studies that had evaluated the effectiveness of health-improving interventions for obtaining employment. We accepted any type of intervention that included a health-improving element at the individual level. We grouped interventions as therapeutic interventions and combined interventions that included therapeutics and job-search training.

We included studies where the control intervention was 'no intervention'. We considered various activities offered to control groups, such as appointments, social programme, and job-search literature packages, to be equal to 'no intervention'. We excluded studies in which the health component could not be separated from the effect of other intervention components. Further, we excluded studies with interventions designed specifically for the treatment of specific medical conditions (e.g. rehabilitation programmes) and patient groups.

Types of outcome measures

Primary outcomes

- Re-employment. Percentage or number of participants who obtained:
 - paid, or
 - supported employment.

We also collected information about hours or weeks of gained employment.

Secondary outcomes

- Health outcomes such as:
 - general health status (e.g. measured as self-rated health);
 - physical health (e.g. measured with functioning tests or by increased physical activity);
 - mental health (e.g. measured with the Beck Depression Inventory) (Kendall 1987).
- Work ability (e.g. self-reported Work Ability Score or Work Ability Index) (El Fassi 2013).
- Adverse events associated with the intervention. We considered any reported adverse events, such as decrease in health state or physical activity.
- Cost-effectiveness of the intervention.

We considered the following follow-up times for outcome measurement: short term, defined as less than three months after the intervention had been completed; and long term, defined as three months or longer.

Reporting one or more of the secondary outcomes listed here in the trial was not an inclusion criterion for the review.

Search methods for identification of studies

Electronic searches

We conducted a systematic literature search to identify all published and unpublished trials that could be considered eligible for inclusion in this review. We adapted the search strategy that we developed for PubMed (see [Appendix 1](#)) for use in the other electronic databases. We imposed no restriction on language of publication. We arranged for the translation of key sections of potentially eligible non-English language papers or we arranged

that people who are proficient in the publications' languages fully assessed them for potential inclusion in the review, as necessary.

We searched the following electronic databases from inception to August 13, 2019 for identifying potential studies.

- Cochrane Central Register of Controlled Trials (CENTRAL) (Wiley Online Library).
- MEDLINE (PubMed) ([Appendix 1](#)).
- Scopus (scopus.com) ([Appendix 2](#)).
- PsycINFO (ProQuest) ([Appendix 3](#)).
- CINAHL (ebSCO.com) ([Appendix 4](#)).
- SocINDEX (ebSCO.com) ([Appendix 5](#)).
- NIOSHTIC (OSH-UPDATE) ([Appendix 6](#)).
- NIOSHTIC-2 (OSH-UPDATE) ([Appendix 6](#)).
- HSELINE (OSH-UPDATE) ([Appendix 6](#)).
- CISDOC (OSH-UPDATE) ([Appendix 6](#)).

We also conducted a search of unpublished trials in ClinicalTrials.gov (www.clinicaltrials.gov/), and the WHO trials portal (www.who.int/ictrp/en/).

Searching other resources

We checked reference lists of all primary studies and review articles for additional references. We aimed at contacting experts in the field to identify additional unpublished materials.

Data collection and analysis

Selection of studies

We conducted the selection of eligible studies in two stages with the review management programme Covidence ([Covidence 2018](#)). First, two review authors (MH, KL) independently screened titles and abstracts of all the potentially relevant studies that we found with our systematic search to exclude studies that clearly did not fulfil the criteria for inclusion. The same review authors coded them as 'include' (eligible or potentially eligible) or 'exclude'. At this stage, we excluded all references that clearly did not fulfil our inclusion criteria or that did fulfil our exclusion criteria.

At the second stage, we retrieved the full-text study reports or publications for all references that we included at the first stage and one review author (MH) assessed the full-text and identified studies for inclusion. Another review author (KL) conducted the same assessment independently so that all full-text reports were assessed independently by two review authors. We resolved any disagreement through discussion or, if required, we consulted a third review author (TS) for making a final decision. At this stage, we included all references that really did fulfil our inclusion criteria.

We recorded reasons for exclusion of the ineligible studies assessed as full text so that we could report these in a '[Characteristics of excluded studies](#)' table. We identified and excluded duplicates and collated multiple reports of the same study so that each study rather than each report was the unit of interest in the review. We recorded the selection process in sufficient detail to complete a PRISMA study flow diagram ([Moher 2009](#)).

Should our systematic searches have identified studies conducted by authors of this review, we made sure to avoid conflict of interest

by having all decisions concerning inclusion and exclusion made by review authors who were not involved with the study.

Data extraction and management

We used a data collection form for study characteristics and outcome data which had been piloted on at least one study in the review. One review author (MH) extracted study characteristics from included studies. We extracted the following study characteristics.

- Methods: study design, total duration of study, study location, study setting, withdrawals, and date of study.
- Participants: number of participants, mean age or age range, gender, duration of unemployment, inclusion criteria, and exclusion criteria.
- Interventions: description of intervention, comparison, duration, intensity, content of both intervention and control condition, and co-interventions.
- Outcomes: description of primary and secondary outcomes specified and collected, and at which time points reported.
- Notes: funding for trial, and notable conflicts of interest of trial authors.

Two review authors (MH, KL) independently extracted outcome data from included studies. We noted in the '[Characteristics of included studies](#)' table if outcome data were not reported in a usable way. We resolved disagreements by consensus. One review author (MH) transferred data into the Review Manager 5 (RevMan) file ([Review Manager 2014](#)). We double-checked that data were entered correctly by comparing the data presented in the systematic review with the study reports. A second review author (KL) spot-checked study characteristics for accuracy against the trial report. Should we decide to include studies published in one or more languages in which our author team was not proficient, we arranged for a native speaker or someone sufficiently qualified in each foreign language to fill in a data extraction form for us.

Assessment of risk of bias in included studies

Two review authors (MH, KL) independently assessed risk of bias for each study using the criteria outlined in the *Cochrane Handbook for Systematic Reviews of Interventions* ([Higgins 2011](#)). We resolved any disagreements by discussion. We assessed the risk of bias according to the following domains.

- Random sequence generation.
- Allocation concealment.
- Blinding of participants and personnel.
- Blinding of outcome assessment.
- Incomplete outcome data.
- Selective outcome reporting.
- Other bias.

We graded each potential source of bias as high, low or unclear and provided a quote from the study report together with a justification for our judgement in the 'Risk of bias' table. We summarised the 'Risk of bias' judgements across different studies for each of the domains listed. We considered blinding separately for different key outcomes, where necessary. Where information on risk of bias related to unpublished data or correspondence with a trialist, we noted this in the 'Risk of bias' table.

Overall risk of bias at study level

We judged a study to have a high risk of bias overall when we judged one or more domains to have a high risk of bias. Conversely, we judged a study to have a low risk of bias when we judged low risk of bias for all domains.

When considering treatment effects, we took into account the risk of bias for the studies that contributed to that outcome.

Assessment of bias in conducting the systematic review

We conducted the review according to the published protocol and reported any deviations from it in the 'Differences between protocol and review' section of the systematic review.

Measures of treatment effect

We entered the outcome data for each study into the data tables in RevMan 5 to calculate the treatment effects ([Review Manager 2014](#)). We used risk ratios for dichotomous outcomes. For continuous outcomes, we used mean differences when outcome measurements in all studies were made on the same scale or standardised mean differences when the studies all assessed the same outcome, but measured it in a variety of ways. Higher scores in standardised mean differences were interpreted as better health.

If only effect estimates and their 95% confidence intervals or standard errors were reported in studies, we entered these data into RevMan 5 using the generic inverse variance method ([Review Manager 2014](#)). We ensured that higher scores for continuous outcomes had the same meaning for the particular outcome, explained the direction to the reader and reported where the directions were reversed, if this was necessary. When the results could not be entered in either way, we described them in the 'Characteristics of included studies' table, or entered the data into 'Additional tables'.

Dealing with missing data

We contacted investigators or study sponsors in order to verify key study characteristics and obtained missing numerical outcome data where possible (e.g. when a study was identified as abstract only).

Assessment of heterogeneity

We assessed the clinical homogeneity of the results of included studies based on the similarity of population, intervention, outcome and follow-up.

- We considered populations as similar when the duration of their unemployment was short-term (i.e. less than 12 months) or long-term (12 months or more).
- We considered interventions as similar when they could be grouped as therapeutic or combined interventions.
- We considered paid employment and supported employment as different outcomes.
- We regarded follow-up times, defined as short-term (if less than or up to three months) and long-term (if longer than three months) as different.

We used the I^2 statistic to measure heterogeneity among the trials in each analysis. If we identified substantial heterogeneity, we reported it and explored possible causes by prespecified subgroup

analysis. We considered heterogeneity as substantial if I^2 was above 50%.

Assessment of reporting biases

For comparisons with more than five trials, we created and examined a funnel plot to explore possible small study biases.

Data synthesis

We pooled data from studies we judged to be clinically homogeneous, as defined in the section [Assessment of heterogeneity](#), using RevMan 5 software ([Review Manager 2014](#)). If more than one study provided usable data in any single comparison, we performed a meta-analysis. We used a random-effects model because we believe that the type of intervention and study designs included will always lead to heterogeneity. When I^2 was higher than 75%, we did not pool the results of studies in a meta-analysis.

Where multiple trial arms were reported in a single trial, we included only the relevant arms. If two comparisons from the same study were combined in one meta-analysis, we halved the control group to avoid double-counting ([Kaldo 2018](#)).

'Summary of findings' table

We created 'Summary of findings' tables for only the main comparisons that are of most interest to decision makers. We reported all outcomes for these comparisons. We used the five GRADE considerations (study limitations, consistency of effect, imprecision, indirectness, and publication bias) to assess the quality of a body of evidence as it related to the studies that contributed data to the meta-analyses for the prespecified outcomes. We used methods and recommendations described in Section 8.5 and Chapter 12 of the *Cochrane Handbook for Systematic Reviews of Interventions* ([Higgins 2011](#)), using GRADEpro software ([GRADEpro 2015](#)). We justified all decisions to down- or upgrade the quality of studies using footnotes.

Subgroup analysis and investigation of heterogeneity

We planned to carry out subgroup analyses according to age and gender, but the number of studies in the subgroups was too low to perform such subgroup analyses.

Sensitivity analysis

We planned to perform sensitivity analysis to assess the robustness of our conclusions, but the number of studies was too low.

Reaching conclusions

We based our conclusions only on findings from the quantitative synthesis of included studies for this review. We avoided making recommendations for practice based on more than just the evidence, such as values and available resources. Our implications for research suggested priorities for future research and outlined what the remaining uncertainties are in the area.

RESULTS

Description of studies

See: [Characteristics of included studies](#), [Characteristics of excluded studies](#) and [Characteristics of ongoing studies](#).

Results of the search

Figure 1 shows the PRISMA study flow diagram of included and excluded studies. We identified 5748 potentially relevant records through a comprehensive literature search of electronic databases. Most of them (37%) were retrieved by Scopus. We screened 3931 references for eligibility after removing duplicates. Based on the title and the abstract, we excluded 3863 references. We identified one ongoing study by searches from the web sites ClinicalTrials.gov

and the WHO trials portal, which is listed in the [Characteristics of ongoing studies](#) table. We contacted the corresponding authors of two studies that fulfilled our inclusion criteria but did not provide sufficient data on our primary outcome. To identify additional potentially eligible studies, we checked the reference lists of all the included studies and retrieved reviews ([Audhoe 2010](#); [Koopman 2017](#); [Liu 2014](#); [Moore 2017](#); [Suijkerbuijk 2017](#); [Van Rijn 2014](#)) and found six additional references.

Figure 1. PRISMA flow diagram of reference selection and study inclusion.

Included studies

We included 15 RCT studies with 16 interventions including a total of 5397 unemployed participants. The smallest RCT consisted of 42 participants (Spera 1994) and the largest included 1261 participants (Vuori 2002). Included studies were conducted in high-income countries, most of them in the United States ($n = 4$). Two studies were conducted in the Netherlands and in Finland, and the rest of the studies were conducted in Australia ($n = 1$), Israel ($n = 1$), Germany ($n = 1$), Spain ($n = 1$), the United Kingdom ($n = 1$), Sweden ($n = 1$), and Canada ($n = 1$). Most studies were performed by the employment offices (Caplan 1989, Creed 1999, Eden 1993, Hodzic 2015, Schuring 2009, Vinokur 1995, Vuori 2002), three by the outplacement firms (Britt 2018; Joseph 2001, Spera 1994), two studies were community-based (Brenninkmeijer 2012, Proudfoot 1997), two by healthcare groups (Kaldo 2018; Romppainen 2014) and one study was multi-site (Herbig 2012). Table 1 summarises the main characteristics of the included studies.

Participants

The mean age of the study participants, 38 years, was calculated based on all the included studies except for Eden 1993 which reported no age and for Kaldo 2018 and Schuring 2009 which reported age by age groups. In one RCT (Creed 1999), the mean age of the participants was only 19.4 years and another RCT (Herbig 2012) specifically focused on adults over 50 years. Gender was described in 12 studies and more participants were female (54.6%) than male. Marital status was described in four trials and one-third of the (30.1%) participants were married or cohabiting. The mean duration of unemployment reported in eight studies was 23.2 months, ranging from 1.8 months (Eden 1993) to 6.8 years (Herbig 2012). Follow-up time in included studies ranged from two months (Eden 1993) to three years (Romppainen 2014).

In five studies (Caplan 1989; Eden 1993; Joseph 2001; Spera 1994; Vinokur 1995), participants were short-term unemployed (< 12 months), in three studies (Creed 1999; Herbig 2012; Proudfoot 1997), participants were long-term unemployed (≥ 12 months) and in seven studies (Brenninkmeijer 2012; Britt 2018; Hodzic 2015; Kaldo 2018; Romppainen 2014; Schuring 2009; Vuori 2002), unemployment duration was not specified.

Types of interventions

Therapeutic interventions

Therapeutic interventions alone (Creed 1999; Hodzic 2015; Joseph 2001; Kaldo 2018; Proudfoot 1997; Romppainen 2014; Schuring 2009; Spera 1994) were compared with no intervention. These interventions used several methods, such as diagnostics and health screenings, health-related advice and counselling, cognitive behavioural therapy, emotion regulation, and physical exercise. Therapeutic methods were symptom-based and were targeted to alleviate the negative effects and thoughts, and stress of being unemployed. In addition to targeting mental health, they addressed pain and physical health. Intervention durations varied from three days to three years.

Combined interventions

Combined interventions included therapeutic methods and job-search training (Brenninkmeijer 2012; Caplan 1989; Creed 1999; Eden 1993; Hodzic 2015; Joseph 2001; Proudfoot 1997; Schuring 2009; Vinokur 1995; Vuori 2002) and were compared to no intervention. Therapeutic components in the included studies aimed at enhancing self-esteem and self-efficacy, increasing constructive thoughts and optimism, providing coping skills (with setbacks and barriers, emotion regulation, health-related problems, negative consequences of unemployment) and enhancing social support. Job-search training included job-application training, group activation, competency inventory, identification of skills and qualifications, role-playing, and group discussions. Durations of combined interventions varied from one week to six months.

Table 2 describes the contents of the interventions.

Outcomes

Re-employment was self-reported except for Britt (Britt 2018) where a program worker checked the job-search progress. Re-employment was measured as the percentage or number of people who got a job. Re-employment was reported as paid employment in all of the studies; no outcomes of supported employment were reported.

General health was measured in Schuring (Schuring 2009) with Short Form-36 Health Survey (SF-36). Mental health was measured with Short Form-36 Health Survey (Schuring 2009) and with General Health Questionnaire 30 (Proudfoot 1997). These measures were self-reported.

There were no studies that measured work-ability, adverse events or cost-effectiveness.

Short-term follow-up time (≤ 3 months) was reported in one study (Eden 1993) and all the other studies reported long-term follow-up times (> 3 months). For further details see Characteristics of included studies table.

Excluded studies

We assessed 68 studies as full text from the total of 5748 references. Of those, 53 were excluded, because they were not RCT studies ($n = 7$), there were no interventions described ($n = 18$), or they included the wrong participants ($n = 5$). In 25 studies, no re-employment outcomes were reported. See the Characteristics of excluded studies table for further details.

Risk of bias in included studies

The Characteristics of included studies table presents the results of the 'Risk of bias' assessment of studies. The 'Risk of Bias' graph is the review authors' judgements about each risk of bias item presented as percentages across all the included studies (Figure 2). The 'Risk of bias' summary (Figure 3) shows review authors' judgements about each risk of bias item for each included study.

Figure 2. Risk of bias graph: review authors' judgements about each risk of bias item presented as percentages across all included studies.

Figure 3. Risk of bias summary: review authors' judgements about each risk of bias item for each included study.

	Random sequence generation (selection bias)	Allocation concealment (selection bias)	Blinding of participants and personnel (performance bias)	Blinding of outcome assessment (detection bias)	Incomplete outcome data (attrition bias)	Selective reporting (reporting bias)	Other bias
Brenninkmeijer 2012	+	+	-	+	-	+	?
Britt 2018	?	?	?	+	+	+	?
Caplan 1989	?	?	?	+	+	+	+
Creed 1999	-	?	?	+	-	+	+
Eden 1993	?	+	?	+	+	+	+
Herbig 2012	-	?	?	+	-	-	-
Hodzic 2015	+	?	+	+	?	+	?
Joseph 2001	+	?	+	+	-	+	-
Kaldo 2018	+	+	?	+	+	+	+
Proudfoot 1997	+	?	+	+	-	+	-
Romppainen 2014	?	?	?	-	-	+	+
Schuring 2009	+	+	-	+	+	+	+
Spera 1994	?	?	?	+	+	-	+
Vinokur 1995	+	+	?	+	+	+	+
Vuori 2002	?	+	+	+	+	+	+

Allocation

Eight of the 15 included RCT studies reported adequate random sequence generation (Brenninkmeijer 2012; Hodzic 2015; Joseph 2001; Kaldo 2018; Proudfoot 1997; Schuring 2009; Vinokur 1995; Vuori 2002). The authors reported having used blocked randomisation, random numbers table or computerised randomisation. Six studies reported adequate allocation concealment. Schuring 2009, Brenninkmeijer 2012, and Kaldo 2018 reported that the allocation sequence was concealed until the participant had been assigned. Two studies used central allocation (Vinokur 1995; Vuori 2002) and one study used placement officers to assign participants (Eden 1993).

Blinding

Nine of 15 studies did not provide any information about blinding of participants or personnel performing the intervention. Schuring 2009 and Brenninkmeijer 2012 reported that blinding was not possible and three studies reported blinding the participants. In Joseph 2001 the study used a placebo imagery intervention, in two studies (Hodzic 2015; Proudfoot 1997) participants were not aware of two different interventions, and in the Vuori 2002 study, participants were told about the two experimental conditions. Twelve studies reported that outcome data collection was made by self-administered questionnaires, which we judged as having high risk of bias. Only one study (Schuring 2009) reported that persons who were involved in data collection and data entry were blinded.

Incomplete outcome data

Three studies reported reasons for participant dropout (Brenninkmeijer 2012; Eden 1993; Proudfoot 1997) and seven studies reported the results of dropout analyses (Creed 1999; Joseph 2001; Kaldo 2018; Romppainen 2014; Schuring 2009; Vinokur 1995; Vuori 2002). Spera 1994 reported that the study had only one dropout. Three studies reported that an ITT analysis was performed (Caplan 1989; Schuring 2009; Vuori 2002).

Selective reporting

Eight studies were free of selective reporting bias as they reported explicitly all the outcomes described in the methods (Brenninkmeijer 2012; Britt 2018; Creed 1999; Hodzic 2015; Joseph 2001; Kaldo 2018; Proudfoot 1997; Schuring 2009).

Other potential sources of bias

In nine studies, baseline characteristics were similar (Caplan 1989; Creed 1999; Eden 1993; Kaldo 2018; Romppainen 2014; Schuring 2009; Spera 1994; Vinokur 1995; Vuori 2002). Two studies reported differences in two variables (Brenninkmeijer 2012; Hodzic 2015) and one study (Proudfoot 1997) reported baseline similarity only for age. In one study, baseline characteristics were different (Herbig 2012) and Joseph 2001 did not report baseline characteristics. Seven studies reported the funding source (Caplan 1989; Kaldo 2018; Proudfoot 1997; Schuring 2009; Spera 1994; Vinokur 1995; Vuori 2002).

Effects of interventions

See: [Summary of findings for the main comparison](#) Therapeutic interventions compared to no intervention; [Summary of findings 2](#) Combined interventions compared to no intervention

1. Therapeutic interventions

Outcome: employment

The studies assessing therapeutic interventions with long-term follow-up included a total of 1142 participants with 585 participants in intervention groups and 557 in control groups. The combined results of eight studies showed very low-quality evidence that therapeutic interventions led to higher re-employment rates than no intervention (RR = 1.41, 95% CI 1.07 to 1.87, n = 1142; [Analysis 1.1](#)).

Outcome: general and mental health

Moderate-quality evidence showed no difference in the effect of therapeutic interventions compared to no intervention on mental health (SMD 0.12, 95% CI -0.06 to 0.29, n = 530; [Analysis 1.3](#)) and low quality evidence on general health (SMD 0.19, 95% CI -0.04 to 0.41, n = 318; [Analysis 1.2](#))

2. Combined interventions

Outcome: employment, long-term follow-up

Combined interventions with long-term follow-up included a total of 4101 participants with 2343 participants in intervention groups and 1758 in control groups. Moderate-quality evidence showed that combined interventions increased employment compared to no intervention (RR 1.12, 95% CI 1.06 to 1.20, n = 209; [Analysis 2.1](#)).

Outcome: employment, short-term follow-up

Results of one combined intervention with short-term follow-up showed very low-quality evidence that there was no difference in effect of intervention compared to no intervention (RR 1.18, 95% CI 0.78 to 1.79, n = 66; [Analysis 3.1](#))

Outcome: hours worked per week

Only one study (Caplan 1989) reported hours worked per week, but we could not use the numbers because of inadequate reporting.

DISCUSSION

Summary of main results

This Cochrane review included 15 RCT studies (16 interventions) with a total of 6397 unemployed participants. Therapeutic interventions compared to no intervention for unemployed job seekers may increase employment at long-term follow-up but the evidence is very uncertain, [Summary of findings for the main comparison](#). These interventions may have no effects on general and mental health. There was moderate-quality evidence from six combined interventions compared to no intervention that combined interventions probably increase employment slightly with long-term follow-up, [Summary of findings 2](#).

Overall completeness and applicability of evidence

In the included studies, the experimental group was most often compared to practice-as-usual, so participants in control groups received regular services offered by employment offices or health services. Only one study (Eden 1993) provided outcome information on short-term follow-up. The most common long-term follow-up period was four months and follow-up time ranged from four months to three years. One study was performed in the 1980s (Caplan 1989), while five of the included studies were

conducted in the 1990s. [Vuori 2002](#) was also conducted in the 1990s but reported in the 2000s. Two studies were from the 2000s ([Joseph 2001](#); [Schuring 2009](#)) and six were performed in the 2010s ([Brenninkmeijer 2012](#); [Britt 2018](#); [Herbig 2012](#); [Hodzic 2015](#); [Kaldo 2018](#); [Romppainen 2014](#)). Although the time period covered over 25 years, there was not much change in the content of interventions. The oldest study ([Caplan 1989](#)) was based on the JOBS protocol developed in the United States in the 1980s and interventions that used the same protocol were reported in every decade. This intervention is relatively short and intensive; therefore, it might be easier to organise and recruit the participants. Three studies ([Creed 1999](#); [Kaldo 2018](#); [Proudfoot 1997](#)) were based on the cognitive-behavioural therapy (CBT) and the [Herbig 2012](#) study also offered CBT to participants. In the [Kaldo 2018](#) study, one study arm was Internet-based CBT. Two studies applied innovative methods, imagery and writing, and these studies were more or less 20 years old.

Three interventions ([Herbig 2012](#); [Kaldo 2018](#); [Romppainen 2014](#)) were conducted in collaboration with primary healthcare, but they did not show any effect on health or re-employment. In [Romppainen 2014](#), participants in the control group evaluated their health better compared to the intervention group. Also, in the [Schuring 2009](#) study, more people in the control group found employment compared to those in a health promotion programme. The results of these two studies were not significant though.

It is important to consider the duration of unemployment of participants when assessing the effectiveness of interventions. In both subgroups of short-term and long-term unemployed participants of therapeutic interventions, employment increased whereas in the subgroup of mixed unemployment duration there was no effect. Combined interventions, in turn, did not increase employment in the subgroup of long-term unemployed participants. This subgroup, though, consisted of only one study. The shorter the period of unemployment, the faster the expected re-employment. Re-employment rates vary across countries but also across regions within a country. Moreover, highly educated

people are expected to be employed more quickly than those with lower education and, in turn, ageing unemployed are re-employed more slowly than younger people. In addition to the economic situation, the cultural and societal context is also critical. Results of this review cannot be generalised as such, because all the studies were conducted in high-income countries. However, intervention effects may vary within high-income countries due to the offered level of social security and of amount and duration of unemployment benefits. High benefits may decrease the incentives to search for new jobs.

Quality of the evidence

[Table 3](#) summarises the graded evidence. We graded the quality of evidence of two comparisons that are presented in the 'Summary of findings' tables. We judged all the included studies to have high risk of bias, because one or more 'Risk of bias' domains was at high risk. In most studies, risk of bias was high or unclear due to lack of blinding. Even though the outcome assessment was not blinded, we judged the risk of bias to be low. This is because a self-report of the participants' employment status is not a subjective assessment, but considered fairly objective. We downgraded the comparison with therapeutic interventions because of substantial heterogeneity. The subgroup of participants with any duration of unemployment differed from the groups of short-term and long-term unemployed which showed beneficial effects of interventions. There were small studies with large effects and wide confidence intervals in the subgroup of any unemployment duration. We downgraded the comparison with combined interventions because of limitations. Comparison of therapeutic interventions compared to no intervention included eight studies and comparison for combined interventions compared to no intervention with long-term follow-up included six studies. We analysed potential publication bias for both comparisons with the funnel plot graph ([Figure 4](#); [Figure 5](#)). [Figure 5](#) showed a substantial bias which was caused by two small studies with positive results. However, these studies had very little weight in the results.

Figure 4. Funnel plot of comparison: 1 Therapeutic interventions vs no intervention, outcome: 1.1 Re-employment.

Figure 5. Funnel plot of comparison: 2 Combined interventions, outcome: 2.1 Re-employment.

Potential biases in the review process

We conducted systematic literature searches from 10 databases without any restrictions on language or date. We searched for additional studies from the reference lists of included studies and reviews. We contacted the original study authors in case of missing or unclear data. Four of the six contacted authors provided the requested data. The classification of the included interventions was complicated because all the interventions had multi-components. We classified interventions based on the classification of health interventions by WHO (ICHI 2019).

Agreements and disagreements with other studies or reviews

We did not find earlier systematic reviews that focused on health interventions that aimed at increasing employment among unemployed job seekers. One systematic review has assessed the effects of vocational interventions on employment and mental distress (Audhoe 2010) and job-search interventions (Liu 2014) on re-employment. We assessed interventions (combined interventions) that were not merely about job search, but included therapeutic components. Two reviews assessed interventions that aimed at enhancing the mental health of unemployed job seekers (Koopman 2017; Moore 2017). Moreover, a study of Holleder 2018 was an overview of health promotion measures offered to the unemployed. The results of these reviews can not be compared

to our results because these reviews did not assess obtained employment.

AUTHORS' CONCLUSIONS

Implications for practice

Based on the results of 15 trials, therapeutic interventions compared to no intervention may increase employment, but the evidence is very uncertain. There may be no difference in the effects of therapeutic interventions compared to no intervention on mental health and on general health. Combined interventions that included therapeutic methods and job-search training probably slightly increase employment compared to no intervention.

Implications for research

The most common follow-up time was four months in studies included in this review. Therefore, we recommend that studies with longer follow-up times should be carried out. Short follow-up may not be sufficient for assessing how people manage to get and maintain sustainable employment. The included studies were all RCTs, but these were at high risk of bias in allocation concealment and blinding of participants and personnel. Some studies stated that blinding was not feasible; nevertheless, some studies were blinded. In this review, more than half of the included studies had fewer than 50 participants per condition. Therefore, we recommend that RCTs with larger sample sizes should be

conducted. Future interventions should be targeted to either short-term or long-term unemployed, because these groups have very distinct employability perspectives and needs for support. In terms of health-improving interventions, the short-term unemployed may need a slight boost for self-efficacy, whereas the long-term unemployed may benefit from a more therapeutic approach and rehabilitation.

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* Indicates the major publication for the study

CHARACTERISTICS OF STUDIES

Characteristics of included studies [ordered by study ID]

Brenninkmeijer 2012

Methods	Study design: Randomised controlled trial
	Study grouping: Parallel group

Brenninkmeijer 2012 (Continued)

Participants	<p>Baseline Characteristics</p> <p>Overall</p> <ul style="list-style-type: none">• <i>Age</i>: 19-54 years, mean 38 years• <i>Gender</i>: Male 30%• <i>Ethnicity</i>: Dutch 55%, Antillean 12%, Surinamese 16%, other 17%• <i>Education</i>: Lower secondary 65%, general secondary and higher 35%• <i>Marital status</i>: Single 46%, divorced 35%, married/living together 16%, other 4%• <i>Children</i>: Having children at home 65%• <i>Duration of unemployment</i>: Less than a year 16%, 1-5 years, 30%, more than 5 years 54%• <i>Type of benefit</i>: Social welfare 85%, disability 5%, unemployment 10%, other 11% <p>Included criteria: Individuals receiving unemployment benefits</p> <p>Excluded criteria: Younger than 18 and older than 57.5 years. Individuals who had serious psychoso- cial or behavioural problems</p>
Interventions	<p>Intervention Characteristics</p> <p>JOBS (N = 60)</p> <ul style="list-style-type: none">• <i>Description</i>: Based on the JOBS program developed in 1984. It is a short and intensive group training facilitated by two trainers. Contains four components that aim at the acquisition of skills, strengthening of self-confidence, self-efficacy and problem-solving skills. First component, the active learning process, comprised group discussions, role playing and other activities. In the second part, participants prepared to cope with setbacks and barriers. Third component concerns social support and fourth component was the referent power of the facilitators. <p>Control group (N = 51)</p> <ul style="list-style-type: none">• <i>Description</i>: Two appointments with an employee of the local social service institution
Outcomes	<p><i>Re-employment</i></p> <ul style="list-style-type: none">• Outcome type: Percentage of participants who obtained paid employment
Identification	<p>Country: The Netherlands</p> <p>Setting: Community setting</p>
Notes	
Risk of bias	
Bias	Authors' judgement Support for judgement
Random sequence genera- tion (selection bias)	Low risk "Randomization was obtained by drawing an envelop from a box with en- velopes, each containing one of the three interventions. Randomization oc- curred without replacement."
Allocation concealment (selection bias)	Low risk Allocation by sealed envelopes. Information for 'Risk of bias' assessment was based on correspondence with the author.
Blinding of participants and personnel (perfor- mance bias) All outcomes	High risk No blinding. Information for 'Risk of bias' assessment was based on correspon- dence with the author.

Brenninkmeijer 2012 (Continued)

Blinding of outcome assessment (detection bias) All outcomes	Low risk	Data collection by self-administered questionnaires
Incomplete outcome data (attrition bias) All outcomes	High risk	Data collection after randomisation when participants were aware of their intervention group. This may have caused the significantly higher job-search behaviour in the intervention group.
Selective reporting (reporting bias)	Low risk	All listed outcomes were reported.
Other bias	Unclear risk	Baseline differences between conditions in unemployment duration and job-search behaviour

Britt 2018

Methods	Study design: Randomised controlled trial Study grouping: Parallel group
Participants	Baseline Characteristics Overall <ul style="list-style-type: none"> Age: 17-70 years, mean 36.7 years Gender: Male 51% Marital status: Neither married nor common-law partners 73% Children: Children or legal guardians of children 35% Ethnic background: Aboriginal 59% Duration of unemployment: Mean duration 17 months Type of social benefit: Receiving social assistance 53% Included criteria: Participants were included if they were unemployed or underemployed (working less than 20 hours a week), available for full-time or part-time (20 or more hours per week) employment, and able to attend the OFE program regularly.
Interventions	Intervention Characteristics MI workshops (N = 432) <ul style="list-style-type: none"> Description: The standard Opportunities for Employment (OFE) programme composed of job-search activities plus two group workshops of motivational interviewing (MI). Interviews were based on trans-theoretical model of change (TTM) including six stages of change. First workshop was designed to facilitate movement to the contemplation and preparation stages of change. Second workshop expanded on emotions, stress, self-efficacy, and increasing self-confidence. Individual MI was conducted if a participant had low level of readiness for change or possible signs of lack of motivation were observed by facilitators. Duration: Two (or three) times 3-hour MI workshop Control group (N = 478) <ul style="list-style-type: none"> Description: No intervention
Outcomes	Re-employment <ul style="list-style-type: none"> Outcome type: Percentage of participants who obtained paid employment.

Britt 2018 (Continued)

Identification

Country: Canada

Setting: OFE, a nonprofit corporation helping unemployed people in Winnipeg.

Notes

Risk of bias

Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	Unclear risk	Not reported
Allocation concealment (selection bias)	Unclear risk	Not reported
Blinding of participants and personnel (performance bias) All outcomes	Unclear risk	Not reported
Blinding of outcome assessment (detection bias) All outcomes	Low risk	Employers' records were used to measure employment.
Incomplete outcome data (attrition bias) All outcomes	Low risk	No attrition reported
Selective reporting (reporting bias)	Low risk	All the listed outcomes were reported.
Other bias	Unclear risk	Participants were given a stipend at a baseline (\$10), after completing each workshop (\$10) and after each motivational interview (\$15). Funded by the Pan-Canadian Innovation Initiative of the Canadian federal government, the Advanced Education and Training, provincial government of Manitoba, Canada, and Opportunities for Employment, Winnipeg, Canada.

Caplan 1989

Methods

Study design: Randomised controlled trial

Study grouping: Parallel group

Participants

Baseline Characteristics

Overall

- *Gender:* Male 46%
- *Ethnicity:* Black 15%
- *Age:* Mean 35.9 years (SD = 10.6 years)
- *Education:* Mean 12.9 years (SD = 1.9 years)
- *Marital status:* Single 53%
- *Occupational classification:* Professional and managerial 32%, service and clerical 38%, miscellaneous 20%

Caplan 1989 (Continued)

- *Working with previous employer*: Mean 6 years (SD = 6.3 years)
- *Unemployment duration*: Mean 13 weeks (SD = 9 weeks)

Included criteria: Unemployed persons who were eligible for unemployment compensation or decided to apply for such compensation or both, were included.

Excluded criteria: Persons who were within 2 years of retirement, expected to be recalled to their previous job, showed any obvious signs of mental illness, or reported being unemployed for more than 4 months were excluded.

Interventions	Intervention Characteristics JOBS (N = 606) <ul style="list-style-type: none">• <i>Description:</i> Based on the JOBS program developed in 1984. Group training with eight 3-hour sessions during two weeks facilitated by two trainers. Contains four components that aim at the acquisition of skills, strengthening of self-confidence, self-efficacy and problem-solving skills. First component, the active learning process, comprised group discussions, role-playing and other activities. In the second part, participants prepared to cope with setbacks and barriers. Third component concerns social support and fourth component was the referent power of the facilitators. Control condition (N = 322) <ul style="list-style-type: none">• <i>Description:</i> Booklet briefly describing job-seeking tips was mailed to persons.
Outcomes	<i>Re-employment</i> <ul style="list-style-type: none">• Outcome type: Percentage of participants who obtained paid employment
Identification	Sponsorship source: NIMH Grants #39675 and #2P50MH38330, the latter representing the Michigan Prevention Research Center Country: United States Setting: Four state employment compensation offices in Michigan
Notes	Study was supported by NIMH Grants #39675 and #2P50MH38330, the latter representing the Michigan Prevention Research Center.
Risk of bias	
Bias	Authors' judgement Support for judgement
Random sequence generation (selection bias)	Unclear risk Participants were randomly assigned to the experimental and control conditions.
Allocation concealment (selection bias)	Unclear risk Not reported
Blinding of participants and personnel (performance bias) All outcomes	Unclear risk Not reported
Blinding of outcome assessment (detection bias) All outcomes	Low risk Outcome data were collected by self-administered questionnaires.
Incomplete outcome data (attrition bias)	Low risk Pretest dropouts 298/606. 50% of them were randomly selected for follow-up. Their response rate at six weeks was 87%. Analysis described as ITT was used.

Caplan 1989 (Continued)

All outcomes

Selective reporting (reporting bias)	Low risk	All listed outcomes were reported. Health-related results could not be compared between conditions.
Other bias	Low risk	Not detected

Creed 1999

Methods	Study design: Randomised controlled trial Study grouping: Parallel group	
Participants	Baseline Characteristics Overall <ul style="list-style-type: none"> Age: Mean 19.4 years Included criteria: Participants had to meet the same eligibility criteria for government sponsored labour market training programmes. Excluded criteria: Not reported	
Interventions	Intervention Characteristics CBT training (N = 43) <ul style="list-style-type: none"> <i>Description:</i> Programme was a three-day (five hours a day) cognitive-behavioural-based training course that aimed at improving the mental health and general psychological functioning, and providing coping skills to deal with emotional problems. Sessions included learning constructive thoughts and statements and developing optimistic explanatory styles. Topics were the concept of automatic thoughts, recognising distorted thinking and characteristics of optimistic thinking. Control group (N = 22) <ul style="list-style-type: none"> <i>Description:</i> No intervention 	
Outcomes	<i>Re-employment</i> <ul style="list-style-type: none"> Outcome type: Percentage of participants who obtained paid employment 	
Identification	Country: Australia	

Notes

Risk of bias

Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	High risk	No description of the randomisation procedure. It was mentioned that participants were drawn from across two regions.
Allocation concealment (selection bias)	Unclear risk	Not reported
Blinding of participants and personnel (performance bias)	Unclear risk	Not reported

Creed 1999 (Continued)

All outcomes

Blinding of outcome assessment (detection bias) All outcomes	Low risk	Data collection by self-administered questionnaires.
Incomplete outcome data (attrition bias) All outcomes	High risk	The attrition analyses was done and there were no differences in the amount of dropouts between groups and also, on the demographic or dependent variables. However, the attrition was 51%.
Selective reporting (reporting bias)	Low risk	All the listed outcomes were reported.
Other bias	Low risk	Not detected

Eden 1993

Methods	Study design: Randomised controlled trial Study grouping: Parallel group
Participants	Baseline Characteristics Overall <ul style="list-style-type: none"> <i>Gender:</i> Male 42 % <i>Unemployment duration:</i> Median 8 weeks (ranging from 2 to 18 weeks) Included criteria: Workers officially certified as unemployed were included. Excluded criteria: Not reported
Interventions	Intervention Characteristics Self-efficacy workshop (N = 43) <ul style="list-style-type: none"> <i>Description:</i> The workshop included eight sessions every other workday during 2,5 weeks. Sessions addressed self-efficacy, relevant areas that are damaged by unemployment, such as lack of success experiences, performance anxiety, and disruption of social contacts. Video clips showed successful job-search behaviours followed by discussion and role-playing in small groups. Encouragement was provided by the trainer and peers. Control group (N = 45) <ul style="list-style-type: none"> <i>Description:</i> Control group were told that the workshop was full, but they would be probably included in the future workshops.
Outcomes	<i>Re-employment</i> <ul style="list-style-type: none"> Outcome type: Number of participants who obtained paid employment
Identification	Country: Israel Setting: Employment office
Notes	No funding source reported
Risk of bias	

Eden 1993 (Continued)

Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	Unclear risk	"We randomly assigned 43 to the experimental group and 45 to the control group." No description of sequence generation
Allocation concealment (selection bias)	Low risk	After randomisation, placement officers invited the members of the experimental group to the workshop and asked the controls to fill out questionnaires.
Blinding of participants and personnel (performance bias) All outcomes	Unclear risk	Not reported
Blinding of outcome assessment (detection bias) All outcomes	Low risk	The first two measures were taken by the workshop trainer and last measure was taken at participants' homes.
Incomplete outcome data (attrition bias) All outcomes	Low risk	Attrition was equivalent in both groups and reasons for 10/15 dropouts were reported.
Selective reporting (reporting bias)	Low risk	All listed outcomes were reported.
Other bias	Low risk	Not detected

Herbig 2012

Methods	Study design: Randomised controlled trial Study grouping: Parallel group
Participants	Baseline Characteristics <ul style="list-style-type: none"> • <i>Age:</i> Mean 53.4 years • <i>Gender:</i> Male 50% • <i>Marital status:</i> Married or partner 28% • <i>Education:</i> Lower education 48%, not finished school 15%, vocational training 50%, training qualifications 45.5% • <i>Ethnic background:</i> Non-German background 23.5% • <i>Unemployment duration:</i> Mean 2469 days/6.8 years Included criteria: 1) Over 50 years of age, 2) Long-term unemployed according to German Social Security regulations, 3) Presence of health impairments that affect employability, 4) Understanding enough German that participation in the intervention was possible. Excluded criteria: Not reported
Interventions	Intervention Characteristics AmigA-M (N = 27) <ul style="list-style-type: none"> • <i>Description:</i> AmigA-M: defined as work reintegration with a health-related orientation in München. Duration 6 months, average 8 contacts of average 44 minutes with a case manager, 4 with physician for an average of 36 minutes, 3 with psychologist for an average of 54 minutes (could include short-term CBT). In addition, on average 3 health-related contacts (psychotherapy, alcohol and drugs ad-

Herbig 2012 (Continued)

vice, back to school, treatment or rehabilitation) and on average 2.2 work-related measures (job application training, group activation, competency inventory, qualifications).

Control group (N = 44)

- *Description:* Care-as-usual, waiting-list control: on average 1.1 contact with labour broker

Outcomes	<i>Re-employment</i> <ul style="list-style-type: none"> • Outcome type: Number of participants who obtained paid employment
Identification	Country: Germany
Notes	Funding source not reported

Risk of bias

Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	High risk	"Randomization took place" but after randomisation, participants were still excluded leading to baseline differences.
Allocation concealment (selection bias)	Unclear risk	Not reported
Blinding of participants and personnel (performance bias) All outcomes	Unclear risk	Not possible but unclear if this would have resulted in bias
Blinding of outcome assessment (detection bias) All outcomes	Low risk	All outcomes self-reported and participants were not blinded.
Incomplete outcome data (attrition bias) All outcomes	High risk	Participants were first randomised and only afterwards asked for participation.
Selective reporting (reporting bias)	High risk	Results at follow-up not reported, only the P values.
Other bias	High risk	Baseline characteristics were different.

Hodzic 2015

Methods	Study design: Randomised controlled trial Study grouping: Parallel group
Participants	Baseline Characteristics Overall <ul style="list-style-type: none"> • <i>Age:</i> Mean 34.5 years • <i>Gender:</i> Male 14.5% Included criteria: Criteria were a) being unemployed, b) being motivated about the intervention process, c) not having extensive prior knowledge about the content of the intervention, d) not using the

Hodzic 2015 (Continued)

intervention content for professional purposes, e) not participating in any planned psychological intervention during the training, and f) not being dependent on drugs, alcohol or psycho-pharmaceuticals

Excluded criteria: Not reported

Interventions	Intervention Characteristics Emotional competencies intervention (N = 40) <ul style="list-style-type: none"><i>Description:</i> Intervention lasted 15 hours split into three days in a two-week period. It focused on improving emotional competencies and developing effective emotion-regulation strategies by lectures, group exercises and discussions, pair-work or individual tasks, or role-plays. Participants were also familiarised with breathing techniques and muscle relaxation techniques to regulate negative emotions. Control group (N = 33) <ul style="list-style-type: none"><i>Description:</i> Waiting list	
Outcomes	<i>Re-employment</i> <ul style="list-style-type: none">Outcome type: Percentage of participants who obtained paid employment	
Identification	Country: Spain Setting: Several local employment and training offices	
Notes	No funding source reported	
Risk of bias		
Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	Low risk	The sequence was generated randomly. Information for 'Rsk of bias' assessment was based on correspondence with the author.
Allocation concealment (selection bias)	Unclear risk	Not reported
Blinding of participants and personnel (performance bias) All outcomes	Low risk	Participants were blinded. Information for 'Risk of bias' assessment was based on correspondence with the author.
Blinding of outcome assessment (detection bias) All outcomes	Low risk	Data collection by self-administered questionnaires
Incomplete outcome data (attrition bias) All outcomes	Unclear risk	Final sample consisted of 73 participants. However, for re-employment, outcomes of 66 participants were reported six months and one year after the intervention. No reasons for dropouts were reported.
Selective reporting (reporting bias)	Low risk	All the listed outcomes were reported.
Other bias	Unclear risk	Baseline differences between conditions in two measures

Joseph 2001

Methods	Study design: Randomised controlled trial Study grouping: Parallel group
Participants	Baseline Characteristics Overall <ul style="list-style-type: none"> • <i>Age:</i> 46.8 years (ranging from 29 to 64 years) • <i>Gender:</i> Male 60% • <i>Ethnic background:</i> Caucasian 83%, ethnic minorities 17% • <i>Employment experience:</i> Mean years in last job 8.27 (ranging from 1.17 to 30.58 years) • <i>Unemployment duration:</i> Mean 2.3 months (ranging from 0.0 to 5.8 months) • <i>Annual income:</i> Mean \$77.957 (SD = \$32.394) Included criteria: Unemployed people Excluded criteria: Those unemployed for more than six months, had intention to work part-time (30 hours per week) or on contract (temporary), or participated in psychotherapy were excluded.
Interventions	Intervention Characteristics Imagery intervention (N = 26) <ul style="list-style-type: none"> • <i>Description:</i> Intervention was based on self-generated imagery containing six 20-minute sessions over two weeks. A relaxation segment preceded each session which was carried out in a private room by one participant. Participants first mentally experienced and resolved thoughts and emotions surrounding the job loss, then constructed a valued, successful possible self. Third, they rehearsed competent performance at a job interview and imagined attaining a desired job. Last, participants constructed psychological and spiritual growth opportunities. Placebo imagery control group (N = 26) <ul style="list-style-type: none"> • <i>Description:</i> Participants were asked to imagine their daily job-search activities and to visualise future job-search plans and activities.
Outcomes	Re-employment <ul style="list-style-type: none"> • Outcome type: Number of participants who obtained paid employment
Identification	Country: United States Setting: Four outplacement firms in seven locations in California
Notes	Funding source not reported

Risk of bias

Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	Low risk	"A blocked randomisation procedure was used, with outplacement firm and location as the blocking variables, to control for potential between-firm differences."
Allocation concealment (selection bias)	Unclear risk	Not reported
Blinding of participants and personnel (performance bias)	Low risk	Participants were not aware of their assigned intervention.

Joseph 2001 (Continued)

All outcomes

Blinding of outcome assessment (detection bias) All outcomes	Low risk	Outcomes were self-reported.
Incomplete outcome data (attrition bias) All outcomes	High risk	The attrition rate was 36.5%.
Selective reporting (reporting bias)	Low risk	All the outcomes were reported.
Other bias	High risk	No baseline characteristics reported

Kaldo 2018

Methods	Study design: Randomised controlled trial Study grouping: Parallel group
Participants	Baseline Characteristics Overall <ul style="list-style-type: none"> Age: 18-34 years 25.4%, 35-49 years 35.6%, 50-64 years 39% Gender: Female 60.2% Education: Primary school 6.8%, technical school 12.7%, secondary school 29.7%. post-secondary 2 years 19.5%, tertiary 31.4% <p>Included criteria: Unemployed people with 10 or above on the Patient Health Questionnaire-9 at an initial screening for depression, age (≥ 18 years), no severe somatic illness, no primary alcohol or drug use disorder, and no psychiatric diagnosis requiring specialist treatment</p> <p>Excluded criteria: Patients not belonging to the workforce or being voluntarily away from work; being more than 64 years old or being on a disability pension or early pension at baseline; and being on parental leave, leave of absence or on a sabbatical at any time during the trial were excluded.</p>
Interventions	Intervention Characteristics ICBT (N = 38) <ul style="list-style-type: none"> Treatment was delivered through a secure web site. Intervention was based on CBT principles and contained self-help text modules with useful methods to handle depression and online homework. Participants were contacted before treatment shortly by phone and received brief but active support from a therapist with every module. Physical exercise (N = 40) <ul style="list-style-type: none"> Participants were allocated to three levels of exercise: light (yoga or similar), moderate (intermediate level aerobics) and vigorous (higher intensity aerobics). All the groups were analysed together. Participants were recommended to attend three times a week in a session of 60 minutes for 12 weeks. Meeting with a personal trainer weekly Control group (N = 40) <ul style="list-style-type: none"> Treatment-as-usual
Outcomes	Re-employment

Kaldo 2018 (Continued)

- **Outcome type:** Number of participants who obtained paid employment

Identification	Country: Sweden Setting: Primary care	
Notes		
<i>Risk of bias</i>		
Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	Low risk	Computer program generated the randomisation blocks of 36 persons.
Allocation concealment (selection bias)	Low risk	Allocation was revealed via the database.
Blinding of participants and personnel (performance bias) All outcomes	Unclear risk	Not reported
Blinding of outcome assessment (detection bias) All outcomes	Low risk	Outcomes were self-reported by questionnaires.
Incomplete outcome data (attrition bias) All outcomes	Low risk	82% of participants completed the study.
Selective reporting (reporting bias)	Low risk	All the outcomes were reported.
Other bias	Low risk	Not detected

Proudfoot 1997

Methods	Study design: Randomised controlled trial Study grouping: Parallel group	
Participants	Baseline Characteristics Overall <ul style="list-style-type: none"> • Age: 43 years • Gender: Male 83% • Unemployment duration: 24.5 months (ranging from 12 months to 12 years) Included criteria: Professional people who had been unemployed for longer than 12 months were included. Excluded criteria: Not reported	
Interventions	Intervention Characteristics CBT (N = 145)	

Proudfoot 1997 (Continued)

- *Description:* Programme contained a three-hour session once a week for seven weeks. CBT programme aimed to help participants identify and modify their attributional style by techniques such as eliciting, recording and testing the validity of thoughts, reattribution, behavioural monitoring and experimentation. It used methods such as Socratic questioning, group discussions, self-observation, experimentation, individual and group activities, and homework assignments.

Control group (N = 144)

- *Description:* Control group received a social support programme that aimed to moderate the negative psychological consequences of unemployment by group activities, group discussions, and individual presentations. It had the same duration as the CBT programme.

Outcomes	<i>Re-employment</i> <ul style="list-style-type: none">• Outcome type: Number of participants who obtained paid employment <i>Psychological distress</i> <ul style="list-style-type: none">• Scale: General Health Questionnaire 30	
Identification	Country: Great Britain Setting: Participants were recruited by newspaper advertisements, mail shots, the UK Employment Service and a major outplacement company.	
Notes	Study was supported by the UK Economic & Social Research Council and Legal & General Assurance Co.	
<i>Risk of bias</i>		
Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	Low risk	Allocation was made by a random numbers table.
Allocation concealment (selection bias)	Unclear risk	Not reported
Blinding of participants and personnel (performance bias) All outcomes	Low risk	"Participants were not aware that two different interventions were being used. Investigators were aware of group allocation, but were accompanied in all programmes by co-trainers who were non-investigators."
Blinding of outcome assessment (detection bias) All outcomes	Low risk	Data collected by self-administered questionnaires
Incomplete outcome data (attrition bias) All outcomes	High risk	20/134 participants of the intervention group and 11/110 of the control group withdrew from the study. No reasons for these withdrawals were provided. In addition, 10 participants dropped out because of gaining employment or full-time training. 75% follow-up (94 in intervention group, 89 in control group)
Selective reporting (reporting bias)	Low risk	All listed outcomes were reported.
Other bias	High risk	Baseline similarity in two conditions only for age

Romppainen 2014

Methods	Study design: Randomised controlled trial Study grouping: Parallel group	
Participants	Baseline Characteristics <ul style="list-style-type: none">• <i>Age:</i> 37.8 years• <i>Gender:</i> Male 38%• <i>Education:</i> University or college 19%, vocational school 42.5%• <i>Unemployment duration:</i> Less than a year 67%• <i>Optimal self-rated health:</i> 67.5%• <i>ALMP measure:</i> Vocational training n = 342, subsidised re-employment, n = 140, rehabilitative re-employment, n = 57 Included criteria: Unemployed people participating in active labour market policy measures were included. Excluded criteria: Not reported	
Interventions	Intervention Characteristics Career Health Care (N = 265) <ul style="list-style-type: none">• <i>Description:</i> Career Health Care (CHC) was health promotion and primary prevention intervention that consisted of three health check-ups by occupational health nurses, one at the beginning of the ALMP measure, one at the end and one after three years time. Activities were health screenings, physical performance tests, assessment of work ability, and individual guidance and counselling on health-related risks and problems during unemployment. Participants received referrals and guidance to appropriate health services and, during a three-year period, had an opportunity to contact OHC nurse or physician in case of illness. Control group (N = 274) <ul style="list-style-type: none">• <i>Description:</i> Regular services	
Outcomes	<i>Re-employment</i> <ul style="list-style-type: none">• Outcome type: Percentage of participants who obtained paid employment	
Identification	Country: Finland Setting: Occupational healthcare providers in three localities in southern and central Finland	
Notes	No funding source reported	
Risk of bias		
Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	Unclear risk	Sequence generation method was not reported.
Allocation concealment (selection bias)	Unclear risk	Not reported
Blinding of participants and personnel (performance bias) All outcomes	Unclear risk	Not reported

Romppainen 2014 (Continued)

Blinding of outcome assessment (detection bias) All outcomes	High risk	"The participants of the intervention group completed the questionnaire at the health check-up; participants of the control group returned the questionnaire by post." The presence of healthcare personnel could have affected the results.
Incomplete outcome data (attrition bias) All outcomes	High risk	Dropout was 49% in the intervention group, compared to 31% in the control group.
Selective reporting (reporting bias)	Low risk	All listed outcomes were reported. Health outcomes could not be used due to dichotomisation.
Other bias	Low risk	Authors declared that they had no competing interests.

Schuring 2009

Methods	Study design: Randomised controlled trial Study grouping: Parallel group
Participants	Baseline Characteristics Overall <ul style="list-style-type: none"> Age: 18-44 years: (n = 369) 56.5%, 45-64 years (n = 284) 43.5% Gender: Male 49.2% Marital status: Living with partner (n = 246) 37.7% Education: Higher and intermediate level (n = 236) 36.1%, lower level (n = 417) 63.9% Ethnic background: Native Dutch (n = 153) 23.4%, Turkish/Moroccan (n = 177) 27.1%, Antillean/Surinamese (n = 179) 27.4%, refugee/other immigrants (n = 144) 22.0% Employment experience: Never worked (n = 127) 19.5%, less than 5 years (n = 224) 34.3%, 5 years or more (n = 289) 44.3% Duration of social benefit: Less than 1 year (n = 111) 17.0%, between 1 to 5 years (n = 158) 24.2%, 5 years or more (n = 384) 58.8% Included criteria: People on social security benefits with health problems, but capable of working, and with sufficient Dutch language skills Excluded criteria: Not reported
Interventions	Intervention Characteristics Health promotion programme (N = 343) <ul style="list-style-type: none"> Description: Intervention targeted to change the attitude of the unemployed to their health problems and was based on interdisciplinary pain management approach. One session a week was focused on behavioural education and two sessions on physical activity. Educational component aimed to enhance participants' awareness of health problems, to increase positive coping by reducing fear and avoidance of movement, to enhance self-esteem and mastery, to improve functioning and enhance social skills. Physical activity component comprised fitness training and outdoor and indoor sports. The training program became gradually more demanding during the intervention. Intervention duration was three sessions of three hours each week over a period of 12 weeks. Usual care (N = 310)

Schuring 2009 (Continued)

- **Description:** Participants were referred to vocational rehabilitation services that aimed to re-orientate them on employment and employability, enhancement of job-search skills and more intensive job search.

Outcomes	<p><i>Re-employment</i></p> <ul style="list-style-type: none"> • Outcome type: Percentage of participants who obtained paid employment <p><i>General health</i></p> <ul style="list-style-type: none"> • Scale: Short Form-36 Health Survey (SF-36) <p><i>Mental health</i></p> <ul style="list-style-type: none"> • Scale: Short Form-36 Health Survey (SF-36)
Identification	<p>Sponsorship source: Study was funded by the Public Health Fund (Fonds OGZ) of The Netherlands (reg. no. P161).</p> <p>Country: The Netherlands</p> <p>Setting: The Employment Centre of the City of Rotterdam</p>
Notes	Funding for this study was provided by the Public Health Fund (Fonds OGZ) of The Netherlands (reg. no. P161).

Risk of bias

Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	Low risk	"Randomisation was performed by a researcher with a computer-generated list of random numbers."
Allocation concealment (selection bias)	Low risk	"The allocation sequence was concealed until the participant had been assigned."
Blinding of participants and personnel (performance bias) All outcomes	High risk	"The participants and the professionals providing the intervention could not be blinded."
Blinding of outcome assessment (detection bias) All outcomes	Low risk	"Those who were involved in data collection and data entry were blinded."
Incomplete outcome data (attrition bias) All outcomes	Low risk	85 subjects (28%) dropped out due to an attendance level below 70%. Subjects dropping out reported poorer physical health and mental health at the baseline. This may have affected the results, since those that dropped out could have potentially benefited the most. Subgroup analysis of subjects with participation level > 70% versus reference group did not show any effects of the intervention though. ITT analysis was done.
Selective reporting (reporting bias)	Low risk	All listed outcomes were reported.
Other bias	Low risk	Not detected

Spera 1994

Methods	Study design: Randomised controlled trial Study grouping: Parallel group	
Participants	Baseline Characteristics Overall <ul style="list-style-type: none">• <i>Age:</i> Mean 54 years (ranging from 40 to 68 years)• <i>Gender:</i> Male 98.4%• <i>Employment experience:</i> Mean 20 years with former employer• <i>Unemployment duration:</i> 5 months (all the participants were laid off at the same time from a large computer and electronics firm) Included criteria: Unemployed professionals Excluded criteria: Not reported	
Interventions	Intervention Characteristics Experimental writing group (N = 20) <ul style="list-style-type: none">• <i>Description:</i> Writing sessions of 20 minutes for five consecutive days. Participants were asked to write about their deepest thoughts and feelings concerning unemployment and consequences on their personal and professional lives. After 12 days, their blood pressure, heart rate and weight were recorded. These measurements were repeated once a month during three months. Non-writing control group (N = 22) <ul style="list-style-type: none">• <i>Description:</i> Access to normal outplacement services	
Outcomes	<i>Re-employment</i> <ul style="list-style-type: none">• Outcome type: Number of participants who obtained paid employment	
Identification	Sponsorship source: Study was funded in part by a grant from the National Science Foundation, BNS-9021518 Country: United States Setting: Outplacement firm	
Notes	Study was funded in part by a grant from the National Science Foundation, BNS- 9021518.	
Risk of bias		
Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	Unclear risk	Not reported
Allocation concealment (selection bias)	Unclear risk	Not reported
Blinding of participants and personnel (performance bias) All outcomes	Unclear risk	Not reported
Blinding of outcome assessment (detection bias)	Low risk	Data collection by self-administered questionnaires

Spera 1994 (Continued)

All outcomes

Incomplete outcome data (attrition bias) All outcomes	Low risk	Only 1 participant dropped out.
Selective reporting (reporting bias)	High risk	Results that the authors aimed to report were not clearly presented.
Other bias	Low risk	Not detected

Vinokur 1995

Methods	Study design: Randomised controlled trial Study grouping: Parallel group
Participants	Baseline Characteristics Overall <ul style="list-style-type: none"> • <i>Age:</i> Mean 34,7 years • <i>Gender:</i> Male 45% • <i>Marital status:</i> Married 41% • <i>Education:</i> Did not complete high school 8.6%, high school education 32.4%, some college 35.8%, 4 years of college 13%, more than 4 years of college 10.2% • <i>Ethnic background:</i> African American 21.5%, white 76% • <i>Employment experience:</i> An average of 3.85 years (SD 5.01) in the last job • <i>Unemployment duration:</i> Mean 4.11 months (SD 3.8) <p>Included criteria: Unemployed people looking for a job and were unemployed for no longer than 13 weeks. Those who expressed no preference for one of the programs were included.</p> <p>Excluded criteria: People with a very high depression score, new entrants to the labour market, already re-employed, those who were accompanying others, were not on strike or expecting to be re-called for work in the next few months, or planning to retire in the next two years, were excluded.</p>
Interventions	Intervention Characteristics JOBS II (N = 671) <ul style="list-style-type: none"> • <i>Description:</i> Based on JOBS implementation manual. Intervention contained five 4-hour sessions during a one-week period. Sessions included training on problem-solving and decision-making processes, inoculation against setbacks, receiving social support and positive regard from the trainers, and learning and practicing job-seeking skills. Control group (N = 552) <ul style="list-style-type: none"> • <i>Description:</i> A booklet that briefly described job-search methods and tips
Outcomes	<i>Re-employment</i> <ul style="list-style-type: none"> • Outcome type: Percentage of participants who obtained paid employment
Identification	Sponsorship source: National Institute of Mental Health Grant P30MH38330 to the Michigan Prevention Research Center Country: United States

Vinokur 1995 (Continued)

Setting: Four employment offices in Michigan

Notes Study was supported by National Institute of Mental Health Grant No. P50MH38330 to the Michigan Prevention Research Center.

Risk of bias

Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	Low risk	"A computerized randomisation procedure was used to allocate the low- and the high-risk respondents to a control condition or an experimental condition."
Allocation concealment (selection bias)	Low risk	Central allocation by mailed invitations
Blinding of participants and personnel (performance bias) All outcomes	Unclear risk	Not reported
Blinding of outcome assessment (detection bias) All outcomes	Low risk	Data collection by self-administered questionnaires
Incomplete outcome data (attrition bias) All outcomes	Low risk	85% completed the training. Most of the dropouts had found a job during the training week. Analysis of two months dropouts (16.7% in the control group and 21.3% in the intervention group) was done. At six months, the dropout difference was reduced to 1.6%. Authors concluded that attrition rates could not affect the internal validity of the results.
Selective reporting (reporting bias)	Low risk	All listed outcomes were reported. Health outcomes could not be compared between conditions.
Other bias	Low risk	Not detected

Vuori 2002

Methods **Study design:** Randomised controlled trial

Study grouping: Parallel group

Participants

Baseline Characteristics

Overall

- *Age:* Mean age 37.0 years (SD = 17.3 years) ranging from 18 to 61 years
- *Gender:* Male 22.2%
- *Education:* Primary 27.5%, secondary 57.4%, higher 14%, unknown 1.1%
- *Unemployment duration:* Median 5 months (M = 10.7, SD = 17.3)
- *Unemployment benefit:* High-level union-based benefit 70%
- *Working hours in a last job:* Mean 35.4 hours per week (SD = 7.6)
- *Vocational background:* Technical 14.9%, administrative 27.6%, health and social 10.1%, commercial 20.2%, industry and traffic 11.8%, no vocation 15.4%

Included criteria: Unemployed or had received termination notice were included. They also had to agree on the randomisation procedure and turn in the baseline questionnaire.

Vuori 2002 (Continued)

Excluded criteria: Not reported

Interventions	Intervention Characteristics Työhön program (N = 629) <ul style="list-style-type: none"><i>Description:</i> Työhön program was similar to the original MPRC Job Search Program (JOBS) that was based on theories of active learning process, social modelling, gradual exposure to acquiring skills, practice through role-playing, and inoculation against setbacks. Programme consisted of five four-hour morning sessions during one week. Aim was to create a socially supportive environment that facilitates positive interactions and relationships between trainers and participants and among the participants. Control group (N = 632) <ul style="list-style-type: none"><i>Description:</i> Participants in a control group were given a literature package including the basic themes in job-search training and four guides of services and advice.	
Outcomes	<i>Re-employment</i> <ul style="list-style-type: none">Outcome type: Percentage of participants who obtained paid employment	
Identification	Sponsorship source: Supported by the Finnish Social Insurance Institution, Finnish Ministry of Labor, Finnish Ministry of Social Affairs and Health, and the Finnish Work Environment Fund Country: Finland Setting: Four employment offices in south-western Finland	
Notes	Research supported by the Finnish Social Insurance Institution, Finnish Ministry of Labor, Finnish Ministry of Social Affairs and Health, and the Finnish Work Environment Fund	
Risk of bias		
Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	Unclear risk	"Respondents who completed the pretest questionnaire were randomised into an experimental and control condition." Information for 'Risk of bias' assessment was based on correspondence with the author.
Allocation concealment (selection bias)	Low risk	Central allocation
Blinding of participants and personnel (performance bias) All outcomes	Low risk	Participants were not aware of intervention and control conditions. Information for 'Risk of bias' assessment was based on correspondence with the author.
Blinding of outcome assessment (detection bias) All outcomes	Low risk	Data collection by self-administered questionnaires
Incomplete outcome data (attrition bias) All outcomes	Low risk	Response rate at six months was 88%, response rate at two years was 97%. Dropout effects were controlled and differences were found in sex and in general self-efficacy. All analyses were based on group that included the intervention participants and the non-participants.
Selective reporting (reporting bias)	Low risk	All listed outcomes were reported. Health outcomes could not be used.

Vuori 2002 (Continued)

Other bias	Low risk	Not detected
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ALMP: Active Labour Market Policy

AmigA-M: Arbeitsförderung mit Gesundheitsbezogener Ausrichtung in München

CHC: Career Health Care

CBT: Cognitive Behavioural Training

ICBT: Internet-based Cognitive Behavioural Training

ITT: Intention-to-treat

JOBS: MPRC Job Search Program

MI: Motivational Interviewing

MPRC: Michigan Prevention Research Center

OFE: Opportunities for Employment

OHC: Occupational Health Care

SD: Standard Deviation

TTM: Transtheoretical Model

Characteristics of excluded studies [ordered by study ID]

Study	Reason for exclusion
Ala-Kauhaluoma 2005	No intervention
Audhoe 2010	No intervention
Audhoe 2015	No re-employment outcomes
Barry 2006	Not RCT
Bauknecht 2016	No intervention
Bell 2011	Wrong participants
Bhat 2010	No intervention
Braungardt 2011	No re-employment outcomes
Brenninkmeijer 2006	No re-employment outcomes
Brussig 2014	No intervention
Carlier 2018	No RCT
Claussen 1993	No RCT
Coppins 2008	No re-employment outcomes
Creed 1996	No re-employment outcomes
Creed 1997	No re-employment outcomes
Creed 1998	No re-employment outcomes
Creed 2001	No re-employment outcomes

Study	Reason for exclusion
Dambrun 2014	No re-employment outcomes
Dzuka 2002	No intervention
Gabrys 2013	No re-employment outcomes
García 2017	No re-employment outcomes
Haberecht 2018	No re-employment outcomes
Harris 2002	No re-employment outcomes
Himle 2014	Wrong participants
Holmstrom 2013	No re-employment outcomes
Horns 2012	No re-employment outcomes
Kaukiainen 1998	No re-employment outcomes
Kreuzfeld 2012	No re-employment outcomes
Kreuzfeld 2013	No re-employment outcomes
Kreuzfeld 2015	No re-employment outcomes
Kuhnert 2012	No intervention
Lecomte 2014	Wrong participants
Limm 2015	No re-employment outcomes
Limm 2015a	No re-employment outcomes
Maguire 2014	Not RCT
Malmberg Heimonen 2019	No intervention
Malmberg-Heimonen 2005	No intervention
Marić 2011	No re-employment outcomes
Matt 2006	No RCT
Matthews 1995	No intervention
Merakou 2019	No re-employment outcomes
Mühlpfordt 2012	No intervention
Orr 2013	No intervention
Reynolds 2010	No RCT
Richter 2002	No intervention

Study	Reason for exclusion
Rose 2012	No RCT
Schutgens 2009	No re-employment outcomes
Shirom 2008	No re-employment outcomes
Steil 2013	No intervention
Vastamäki 2009	No intervention
Virgolino 2017	No intervention
Vuori 1999	No intervention
Walker 2016	No intervention

RCT: Randomised Controlled Trial

Characteristics of ongoing studies *[ordered by study ID]*

[Whelan 2018](#)

Trial name or title	EEPIC - Enhancing Employability through Positive Interventions for improving Career potential
Methods	Study design: Randomised controlled trial Study grouping: Parallel group
Participants	Included criteria: Unemployed adults aged 18-60 years who had received job seekers benefit for 12 months or more Excluded criteria: Evidence of serious mental health problem and/or drug misuse
Interventions	Intervention Characteristics EEPIC <ul style="list-style-type: none"> <i>Description:</i> EEPIC is a high-support therapeutic programme with a focus on the development of a career plan. It aims to strengthen human, social and psychological capital to ensure the implementation of the plan. Intervention is a four-stage process which lasts 8-12 weeks. Control group <ul style="list-style-type: none"> <i>Description:</i> Service-as-usual
Outcomes	Primary outcome: Increased well-being Secondary outcomes: Self-esteem, career self-efficacy, resilience, hopefulness, perceived progress towards the labour market, re-employment or labour market participation, re-employment quality, access to education/vocational training
Starting date	September 2016
Contact information	Nuala.whelan.2014@mumail.ie1
Notes	

EEPIC: Enhancing Employability through Positive Interventions for improving Career potential

DATA AND ANALYSES

Comparison 1. Therapeutic interventions vs no intervention

Outcome or subgroup title	No. of studies	No. of participants	Statistical method	Effect size
1 Re-employment	8	1142	Risk Ratio (M-H, Random, 95% CI)	1.41 [1.07, 1.87]
1.1 Short-term unemployment	2	93	Risk Ratio (M-H, Random, 95% CI)	2.02 [1.30, 3.15]
1.2 Long-term unemployment	2	241	Risk Ratio (M-H, Random, 95% CI)	1.67 [1.19, 2.35]
1.3 Any duration of unemployment	4	808	Risk Ratio (M-H, Random, 95% CI)	1.10 [0.83, 1.44]
2 General health	1		Std. Mean Difference (IV, Random, 95% CI)	Totals not selected
3 Mental health	2	530	Std. Mean Difference (IV, Random, 95% CI)	0.12 [-0.06, 0.29]

Analysis 1.1. Comparison 1 Therapeutic interventions vs no intervention, Outcome 1 Re-employment.

Analysis 1.2. Comparison 1 Therapeutic interventions vs no intervention, Outcome 2 General health.

Analysis 1.3. Comparison 1 Therapeutic interventions vs no intervention, Outcome 3 Mental health.

Comparison 2. Combined intervention vs no intervention, long-term follow-up

Outcome or subgroup title	No. of studies	No. of participants	Statistical method	Effect size
1 Re-employment	6	4101	Risk Ratio (M-H, Random, 95% CI)	1.12 [1.06, 1.20]
1.1 Short-term unemployment	2	1810	Risk Ratio (M-H, Random, 95% CI)	1.10 [1.00, 1.20]
1.2 Long-term unemployment	1	71	Risk Ratio (M-H, Random, 95% CI)	2.72 [0.70, 10.46]

Outcome or subgroup title	No. of studies	No. of participants	Statistical method	Effect size
1.3 Any duration of unemployment	3	2220	Risk Ratio (M-H, Random, 95% CI)	1.14 [1.04, 1.26]

Analysis 2.1. Comparison 2 Combined intervention vs no intervention, long-term follow-up, Outcome 1 Re-employment.

Comparison 3. Combined intervention vs no intervention, short-term follow-up

Outcome or subgroup title	No. of studies	No. of participants	Statistical method	Effect size
1 Re-employment	1		Risk Ratio (M-H, Random, 95% CI)	Totals not selected

Analysis 3.1. Comparison 3 Combined intervention vs no intervention, short-term follow-up, Outcome 1 Re-employment.

ADDITIONAL TABLES

Table 1. Table 1. Characteristics of included studies

Study	Country	Design	Unemployment duration	Follow-up time	N	Intervention	Control	Type
Brenninkmeijer 2012	Netherlands	RCT	Any duration	Long-term (LT)	111	JOBS	Two appointments in the social service institution	Combined
Britt 2018	Canada	RCT	Any duration	LT	910	Motivational interviewing	Usual services	Combined
Caplan 1989	United States	RCT	Short-term (ST)	LT	902	JOBS	Booklet with job-search tips	Combined
Creed 1999	Australia	RCT	Long-term (LT)	LT	65	CBT	Usual services	Therapeutic
Eden 1993	Israel	RCT	ST	ST	88	Self-efficacy workshop	Usual services	Combined
Herbig 2012	Germany	RCT	LT	LT	71	Amiga-M program	Care-as-usual	Combined
Hodzic 2015	Spain	RCT	Any duration	LT	73	Emotional competencies	Waiting list	Therapeutic
Joseph 2001	United States	RCT	ST	LT	52	Career transition program	Placebo	Therapeutic
Kaldo 2018	Sweden	RCT	Any duration	LT	60	Physical exercise	Treatment-as-usual	Therapeutic
Kaldo 2018	Sweden	RCT	Any duration	LT	58	ICBT	Treatment-as-usual	Therapeutic
Proudfoot 1997	United Kingdom	RCT	LT	LT	289	CBT	No training	Therapeutic
Romppainen 2014	Finland	RCT	Any duration	LT	539	Career Health Care (CHC)	Usual services	Therapeutic
Schuring 2009	Netherlands	RCT	Any duration	LT	653	Health promotion programme	Care-as-usual	Therapeutic
Spera 1994	United States	RCT	ST	LT	42	Experimental writing	Non-writing control group	Therapeutic

Table 1. Table 1. Characteristics of included studies *(Continued)*

Vinokur 1995	United States	RCT	ST	LT	1223	JOBS	A booklet with job-search methods	Combined
Vuori 2002	Finland	RCT	Any duration	LT	1261	JOBS	Literature package	Combined

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CBT: Cognitive Behavioural Training

CHC: Career Health Care

ICBT: Internet-based Cognitive Behavioural Training

JOBS: Michigan Prevention Research Center Job Search Program

LT: Long-term

RCT: Randomised Controlled Trial

ST: Short-term

Table 2. Descriptions of interventions

Study	Content	Delivered by whom	Frequency	Duration
Therapeutic interventions				
Creed 1999	Cognitive behavioural training (CBT) Aimed at improving mental health and providing coping skills with unemployment. Contents were learning constructive thoughts and statements and developing optimistic explanatory styles.	Registered psychologists who had received training in the delivery of the CBT programme	One 3-hour and one 2-hour session each day (total of 15 hours)	3 days
Hodzic 2015	Emotional competencies EC Focused on improving emotional competencies and developing effective emotion-regulation strategies. Six modules: 1) introduction and identifying one's own and others' emotions, 2) regulating emotions, 3) regulating one's own emotions in relationships, 4) regulating others' emotions in relationships and conflict management, 5) practical techniques for emotional regulation, and 6) positive emotions and using positive emotions to foster well-being. Methods were theoretical explanations, group exercises, group discussions, pair-work or individual tasks, video clips, role-plays, breathing techniques and muscle relaxation techniques.	Two lecturers	2 days consecutive, third day two weeks later. Total of 15 hours	2.5 days
Joseph 2001	Career transition program Intervention was based on self-generated imagery sessions. A relaxation segment preceded each session which was carried out in a private room by one participant. Participants first mentally experienced and resolved thoughts and emotions surrounding the job loss, then constructed a valued, successful possible self. Third, they rehearsed competent performance at a job interview and imagined attaining a desired job. Last, participants constructed psychological and spiritual growth opportunities.	Individual sessions with recorded audio-tapes	Six 20-minute sessions	2 weeks
Kaldo 2018	Physical exercise Participants were allocated to light (yoga or similar), moderate (intermediate level aerobics), or vigorous (higher intensity aerobics).	Face-to-face meetings once a week with a personal trainer, and, for those not attending, a phone call or text message	Recommended a 60-minute session three times a week	12 weeks
Kaldo 2018	Internet-based CBT The treatment was based on self-help text modules, each based on established CBT principles and presenting information on a specific problem area, useful methods to handle it and an online homework report. 30 modules were offered addressing problems related to depressive symptoms, such as inactivity and avoidance behaviours.	In each module, brief but active support from a therapist, a clinical psychologist or last-year psychology student	Participants could choose modules and they worked with one module during a week.	12 weeks

Table 2. Descriptions of interventions (Continued)

		under supervision		
Proudfoot 1997	CBT Included techniques such as eliciting, recording and testing the validity of thoughts, reattribution, behavioural monitoring, and experimentation	Investigators and co-trainers	3-hour session a week	7 weeks
Romppainen 2014	Career Health Care (CHC) Health promotion and primary prevention intervention that consisted of three health check-ups by occupational health nurses, one at the beginning of the ALMP measure, one at the end and one after three years' time. Activities were health screenings, physical performance tests, assessment of work ability, and individual guidance and counselling on health-related risks and problems during unemployment. Participants received referrals and guidance to appropriate health services and, during a three-year period, had an opportunity to contact OHC nurse or physician in case of illness.	Healthcare personnel	3 health check-ups and an opportunity to contact OHC nurse or physician in case of illness	3 years
Schuring 2009	Health promotion programme Intervention targeted to change the attitude of the unemployed to their health problems and was based on interdisciplinary pain management approach. One session a week was focused on behavioural education and two sessions on physical activity. Educational component aimed to enhance participants' awareness of health problems, to increase positive coping by reducing fear and avoidance of movement, to enhance self-esteem and mastery, to improve functioning, and enhance social skills. Physical activity component comprised fitness training and outdoor and indoor sports. The training program became gradually more demanding during the intervention. Intervention duration was three sessions of three hours each week over a period of 12 weeks.	Two prevention workers and physical education teachers	Three 3-hour sessions a week	12 weeks
Spera 1994	Expressive writing Participants were asked to write about their deepest thoughts and feelings concerning unemployment and consequences on their personal and professional lives.	Participants met briefly with an experimenter (one of the authors) to go over the instructions for writing.	20-minute session a day	5 days
Combined interventions				
Brenninkmeijer 2012	JOBS The acquisition of skills, strengthening of self-confidence, self-efficacy and problem-solving skills through four components. First component: The learning process comprises group discussions, brainstorming sessions, role-	Two trained facilitators	Five half-day classes	1 week plus individual consultations with facilitators once or twice a month during 5 months

Table 2. Descriptions of interventions (Continued)

playing exercises and other activities in which individuals can enhance their job-search skills and knowledge. Second component: Participants are prepared to cope with setbacks and barriers through problem-solving strategies and skill acquisition. The third component of JOBS concerns social support within the group and from the facilitators. The fourth component refers to the referent power of the facilitators.

Britt 2018	Motivational interviewing (MI) Interventions consisted of OFE program of job search activities plus MI workshops. First, participants' readiness for change was measured (URICA) and they received either two MI workshops in groups or individual MI depending on their URICA score. Workshop 1: the advantages and disadvantages of being employed and unemployed so as to explore participants' ambivalence. Workshop 2: expanded on the concepts of emotions, stress, self-efficacy, and increasing self-confidence.	Facilitators who received 2 days of training in MI, plus ongoing supervision and coaching provided by a member of the MI network of trainers.	Two 3-hour workshops	MI 2 days, normal OFE program continued
Caplan 1989	JOBS	Male-female pair of trainers	Eight 3-hour sessions	2 weeks
Eden 1993	Self-efficacy workshop Exercises on self-efficacy-relevant areas as lack of success experiences, performance anxiety, disruption of social contacts, decoupling of activities from reality, and discontinuation of familiar routine. In addition, video clips models successfully performing job-search behaviours were screened. This was followed by a brief discussion of the behaviour modelled and by role-playing in small groups in which each participant rehearsed the modelled behaviour and got feedback from the others.	Trainer	Eight sessions	2.5 weeks
Herbig 2012	AmigA-M Identified as work reintegration with a health-related orientation. Could include short-term CBT or psychotherapy, alcohol and drugs advice, back-to-school advice, treatment or rehabilitation. In addition, work-related measures (job application training, group activation, competency inventory, qualifications)	Case managers, physicians, psychologists, other healthcare personnel, and employment trainers	Average 8 contacts of average 44 minutes with a case manager, 4 with physician on average for 36 minutes, 3 with psychologist on average for 54 minutes. In addition, on average 3 health-related contacts and on average 2.2 work-related measures	6 months
Vinokur 1995	JOBS	Pair of male and female co-trainers	5 half-day sessions	1 week

Table 2. Descriptions of interventions *(Continued)*

Vuori 2002

JOBS

Pair of male and
female co-train-
ers

5 half-day ses-
sions

1 week

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CHC: Career Health Care

CBT: Cognitive Behavioural Training

EC: Emotional competencies

JOBS: Michigan Prevention Research Center Job Search Program

MI: Motivational Interviewing

OFE: Opportunities for Employment

OHC: Occupational Health Care

URICA: University of Rhode Island Change Assessment

Table 3. Quality of evidence (GRADE)

Comparison/outcome	Number of studies	Study limitations	Inconsistency	Indirectness	Imprecision	Publication bias	Overall quality of evidence
Therapeutic interventions vs no intervention/Re-employment	8 RCTs	Yes: High risk of bias, 1 level down	Yes: I ² statistics = 52%, 2 levels down	No	No	Not observed	Very low
Therapeutic interventions vs no intervention/General health	1 RCT	No	No	No	Yes, Wide CI, 1 level down	Only one study	Moderate
Therapeutic interventions vs no intervention/Mental health	2 RCTs	Yes: High risk of bias, 1 level down	No	No	Yes: Wide CI, 1 level down	2 studies	Low
Combined interventions vs no intervention/Re-employment, long-term follow-up	6 RCTs	Yes: Lack of blinding, 1 level down	No	No	No	Not observed	Moderate
Combined interventions vs no intervention/Re-employment, short-term follow-up	1 RCT	Yes: High risk of bias, 1 level down	No	No	Yes: Wide CI and small sample size, 2 levels down	Only one study	Very low

CI: Confidence interval

I²: Percentage of variance

RCT: Randomised Controlled Trial

vs: versus

APPENDICES

Appendix 1. MEDLINE search strategy

1 Unemployment/ or unemploy*.mp. or jobless.mp. or ((out or lost) adj1 (work* or job* or employ*)).mp.

2 ((return* or seek* or obtain* or find* or locat*) adj2 (work* or job* or employ*)).mp. or re-employ*.mp. or (back adj1 (work* or job*)).mp. or jobseek*.mp. or workabilit*.mp. or (work adj2 (abilit* OR able)).mp.

3 1 and 2

4 exp Health Status/ or exp Health/ or exp Health Behavior/ or exp Health Promotion/

5 exp Exercise/ or exp Exercise Therapy/ or exp Physical Fitness/ or exp Sports/ or exp Mind-Body Therapies/ or exp Cognitive Therapy/

6 wellbeing.mp. or well-being.mp. or exercise*.mp. or fitness.mp. or sport*.mp. or running.mp. or walking.mp. or swimming.mp. or (weight* adj1 lift*).mp. or train*.mp. or yoga.mp. or gymnastic*.mp. or cycling.mp. or bicycling.mp. or hiking.mp. or hiker*.mp. or relax*.mp. or ((physical or indoor or outdoor) adj2 activit*).mp. or (health adj1 problem*).mp. or (health adj1 care).mp.

7 (cognitive adj2 therap*).mp. or CBT.mp. or (mental adj3 therap*).mp. or ((depress* or worr* or panic or anxiety or stress or insomnia* or smoking or alcohol* or overweight or obesity or nutrition*) adj4 (therap* or manag* or treatment* or train* or guidance)).mp. or ((health or "work abilit*") adj2 (promot* or educat* or screen* or check-up* or assess* or counsel* or guidance* or motivation* or improv*)).mp. or (weight adj2 (control or management)).mp. or sleep*.mp.

8 self-help.mp. or mindfulness.mp. or (behavio* adj2 educat*).mp. or self-esteem.mp. or ((mental or physical or social) adj2 health).mp. or "group session*".mp. or "health behavio*".mp. or "health coach*".mp. or (health adj2 intervention*).mp.

9 4 or 5 or 6 or 7 or 8

10 3 and 9

11 ((unemploy* or jobless or ((out or lost) adj1 (work* or job* or employ*))) and (long-time or long-term or longtime or longterm or "long time" or "long term")).ti.

12 (health* or exercis* or fitness or sport* or wellbeing or well-being or running or walking or swimming or weight* or train* or yoga or gymnastic* or cycling or bicycling or hiking or hiker* or relax* or sleep* or ((physical or indoor or outdoor) adj2 activit*) or problem*).ti.

13 (therap* or CBT or manag* or treatment* or train* or guidance* or depress* or worr* or panic or anxiety or stress or insomnia* or smoking or alcohol* or overweight or obesity or nutrition* or "work abilit*" or promot* or educat* or screen* or check-up* or assess* or counsel* or motivation* or improv*).ti.

14 (self-help or mindfulness or behavio* or self-esteem or "group session").ti.

15 12 or 13 or 14

16 11 and 15

17 10 or 16

Appendix 2. Scopus search strategy

1 TITLE-ABS-KEY(unemploy* or jobless or ((out or lost) W/1 (work* or job* or employ*)))

2 TITLE-ABS-KEY(((return* or seek* or obtain* or find* or locat*) W/2 (work* or job* or employ*)) or re-employ* or (back W/1 (work* or job*)) or jobseek* or workabilit* or (work W/2 (abilit* OR able)))

3 1 and 2

4 TITLE-ABS-KEY("health status" or "health behavio*" or "health promotion")

5 TITLE-ABS-KEY(exercis* or fitness or sport* or wellbeing or well-being or running or walking or swimming or (weight* W/1 lift*) or train* or yoga or gymnastic* or cycling or bicycling or hiking or hiker* or relax* or ((physical or indoor or outdoor) W/2 activit*) or (health W/1 problem*) or (health W/1 care))

6 TITLE-ABS-KEY("mind-body therap*" or (cognitive W/2 therap*) or CBT or (mental W/3 therap*) or ((depress* or worr* or panic or anxiety or stress or insomnia* or smoking or alcohol* or overweight or obesity or nutrition*) W/4 (therap* or manag* or treatment* or train* or

guidance)) or ((health or "work abilit*") W/2 (promot* or educat* or screen* or check-up* or assess* or counsel* or guidance* or motivation* or improv*)) or (weight W/2 (control or management)) or sleep*)

7 TITLE-ABS-KEY(self-help or mindfulness or (behavio* W/2 educat*) or self-esteem or ((mental or physical or social) W/2 health) or "group session*" or "health behavio*" or "health coach*" or (health W/2 intervention*))

8 4 or 5 or 6 or 7

9 3 and 8

10 TITLE((((unemploy* or jobless or ((out or lost) W/1 (work* or job* or employ*))) and (long-time or long-term or longtime or longterm or "long time" or "long term"))))

11 TITLE((health* or exercis* or fitness or sport* or wellbeing or well-being or running or walking or swimming or weight* or train* or yoga or gymnastic* or cycling or bicycling or hiking or hiker* or relax* or sleep* or ((physical or indoor or outdoor) W/2 activit*) or problem*))

12 TITLE((therap* or CBT or manag* or treatment* or train* or guidance* or depress* or worr* or panic or anxiety or stress or insomnia* or smoking or alcohol* or overweight or obesity or nutrition* or "work abilit*" or promot* or educat* or screen* or check-up* or assess* or counsel* or motivation* or improv*))

13 TITLE((self-help or mindfulness or behavio* or self-esteem or "group session*"))

14 11 or 12 or 13

15 10 and 14

16 9 or 15

Appendix 3. PsycINFO search strategy

1 Unemployment/ or unemploy*.mp. or jobless.mp. or ((out or lost) adj1 (work* or job* or employ*)).mp.

2 ((return* or seek* or obtain* or find* or locat*) adj2 (work* or job* or employ*)).mp. or re-employ*.mp. or (back adj1 (work* or job*)).mp. or jobseek*.mp. or workabilit*.mp. or (work adj2 (abilit* OR able)).mp.

3 1 and 2

4 exp Health/ or exp Health Behavior/ or Health Promotion/

5 exp Exercise/ or Physical Fitness/ or exp Physical Activity/ or exp Sports/ or Mind Body Therapy/ or Cognitive Therapy/

6 wellbeing.mp. or well-being.mp. or exercise*.mp. or fitness.mp. or sport*.mp. or running.mp. or walking.mp. or swimming.mp. or (weight* adj1 lift*).mp. or train*.mp. or yoga.mp. or gymnastic*.mp. or cycling.mp. or bicycling.mp. or hiking.mp. or hiker*.mp. or relax*.mp. or ((physical or indoor or outdoor) adj2 activit*).mp. or (health adj1 problem*).mp. or (health adj1 care).mp.

7 (cognitive adj2 therap*).mp. or CBT.mp. or (mental adj3 therap*).mp. or ((depress* or worr* or panic or anxiety or stress or insomnia* or smoking or alcohol* or overweight or obesity or nutrition*) adj4 (therap* or manag* or treatment* or train* or guidance)).mp. or ((health or "work abilit*") adj2 (promot* or educat* or screen* or check-up* or assess* or counsel* or guidance* or motivation* or improv*)).mp. or (weight adj2 (control or management)).mp. or sleep*.mp.

8 self-help.mp. or mindfulness.mp. or (behavio* adj2 educat*).mp. or self-esteem.mp. or ((mental or physical or social) adj2 health).mp. or "group session*".mp. or "health behavio*".mp. or "health coach*".mp. or (health adj2 intervention*).mp.

9 4 or 5 or 6 or 7 or 8

10 3 and 9

11 ((unemploy* or jobless or ((out or lost) adj1 (work* or job* or employ*))) and (long-time or long-term or longtime or longterm or "long time" or "long term")).ti.

12 (health* or exercis* or fitness or sport* or wellbeing or well-being or running or walking or swimming or weight* or train* or yoga or gymnastic* or cycling or bicycling or hiking or hiker* or relax* or sleep* or ((physical or indoor or outdoor) adj2 activit*) or problem*).mp.

13 (therap* or CBT or manag* or treatment* or train* or guidance* or depress* or worr* or panic or anxiety or stress or insomnia* or smoking or alcohol* or overweight or obesity or nutrition* or "work abilit*" or promot* or educat* or screen* or check-up* or assess* or counsel* or motivation* or improv*).mp.

14 (self-help or mindfulness or behavio* or self-esteem or "group session*").mp.

15 12 or 13 or 14

16 11 and 15

17 10 or 16

Appendix 4. Cinahl search strategy

1 unemploy* or jobless or ((out or lost) N1 (work* or job* or employ*))

2 ((return* or seek* or obtain* or find* or locat*) N2 (work* or job* or employ*)) or re-employ* or (back N1 (work* or job*)) or jobseek* or workabilit* or (work N2 (abilit* OR able))

3 1 and 2

4 "health status" or "health behavio*" or "health promotion"

5 exercis* or fitness or sport* or wellbeing or well-being or running or walking or swimming or (weight* N1 lift*) or train* or yoga or gymnastic* or cycling or bicycling or hiking or hiker* or relax* or ((physical or indoor or outdoor) N2 activit*) or (health N1 problem*) or (health N1 care)

6 "mind-body therap*" or (cognitive N2 therap*) or CBT or (mental N3 therap*) or ((depress* or worr* or panic or anxiety or stress or insomnia* or smoking or alcohol* or overweight or obesity or nutrition*) N4 (therap* or manag* or treatment* or train* or guidance)) or ((health or "work abilit*") N2 (promot* or educat* or screen* or check-up* or assess* or counsel* or guidance* or motivation* or improv*)) or (weight N2 (control or management)) or sleep*

7 self-help or mindfulness or (behavio* N2 educat*) or self-esteem or ((mental or physical or social) N2 health) or "group session*" or "health behavio*" or "health coach*" or (health N2 intervention*)

8 4 or 5 or 6 or 7

9 3 and 8

10 ((unemploy* or jobless or ((out or lost) N1 (work* or job* or employ*))) and (long-time or long-term or longtime or longterm or "long time" or "long term"))

11 (health* or exercis* or fitness or sport* or wellbeing or well-being or running or walking or swimming or weight* or train* or yoga or gymnastic* or cycling or bicycling or hiking or hiker* or relax* or sleep* or ((physical or indoor or outdoor) N2 activit*) or problem*)

12 therap* or CBT or manag* or treatment* or train* or guidance* or depress* or worr* or panic or anxiety or stress or insomnia* or smoking or alcohol* or overweight or obesity or nutrition* or "work abilit*" or promot* or educat* or screen* or check-up* or assess* or counsel* or motivation* or improv*

13 self-help or mindfulness or behavio* or self-esteem or "group session*"

14 11 or 12 or 13

15 10 and 14

16 9 or 15

Appendix 5. SocINDEX search strategy

1 unemploy* or jobless or ((out or lost) N1 (work* or job* or employ*))

2 ((return* or seek* or obtain* or find* or locat*) N2 (work* or job* or employ*)) or re-employ* or (back N1 (work* or job*)) or jobseek* or workabilit* or (work N2 (abilit* OR able))

3 1 and 2

4 "health status" or "health behavio*" or "health promotion"

5 exercis* or fitness or sport* or wellbeing or well-being or running or walking or swimming or (weight* N1 lift*) or train* or yoga or gymnastic* or cycling or bicycling or hiking or hiker* or relax* or ((physical or indoor or outdoor) N2 activit*) or (health N1 problem*) or (health N1 care)

6 "mind-body therap*" or (cognitive N2 therap*) or CBT or (mental N3 therap*) or ((depress* or worry* or panic or anxiety or stress or insomnia* or smoking or alcohol* or overweight or obesity or nutrition*) N4 (therap* or manag* or treatment* or train* or guidance)) or ((health or "work abilit*") N2 (promot* or educat* or screen* or check-up* or assess* or counsel* or guidance* or motivation* or improv*)) or (weight N2 (control or management)) or sleep*

7 self-help or mindfulness or (behavio* N2 educat*) or self-esteem or ((mental or physical or social) N2 health) or "group session*" or "health behavio*" or "health coach*" or (health N2 intervention*)

8 4 or 5 or 6 or 7

9 3 and 8

10 TI((unemploy* or jobless or ((out or lost) N1 (work* or job* or employ*))) and (long-time or long-term or longtime or longterm or "long time" or "long term"))

11 (health* or exercis* or fitness or sport* or wellbeing or well-being or running or walking or swimming or weight* or train* or yoga or gymnastic* or cycling or bicycling or hiking or hiker* or relax* or sleep* or ((physical or indoor or outdoor) N2 activit*) or problem*)

12 therap* or CBT or manag* or treatment* or train* or guidance* or depress* or worry* or panic or anxiety or stress or insomnia* or smoking or alcohol* or overweight or obesity or nutrition* or "work abilit*" or promot* or educat* or screen* or check-up* or assess* or counsel* or motivation* or improv*

13 self-help or mindfulness or behavio* or self-esteem or "group session"

14 11 or 12 or 13

15 10 and 14

16 9 or 15

Appendix 6. Cochrane Central search strategy

1 [mh Unemployment] or unemploy* or jobless or ((out or lost) NEAR/1 (work* or job* or employ*))

2 ((return* or seek* or obtain* or find* or locat*) NEAR/2 (work* or job* or employ*)) or re-employ* or (back NEAR/1 (work* or job*)) or jobseek* or workabilit* or (work NEAR/2 (abilit* OR able))

3 1 and 2

4 [mh "Health Status"] or [mh Health] or [mh "Health Behavior"] or [mh "Health Promotion"]

5 [mh Exercise] or [mh "Exercise Therapy"] or [mh "Physical Fitness"] or [mh Sports] or [mh "Mind-Body Therapies"] or [mh "Cognitive Therapy"]

6 wellbeing or well-being or exercise* or fitness or sport* or running or walking or swimming or (weight* NEAR/1 lift*) or train* or yoga or gymnastic* or cycling or bicycling or hiking or hiker* or relax* or ((physical or indoor or outdoor) NEAR/2 activit*) or (health NEAR/1 problem*) or (health NEAR/1 care)

7 (cognitive NEAR/2 therap*) or CBT or (mental NEAR/3 therap*) or ((depress* or worry* or panic or anxiety or stress or insomnia* or smoking or alcohol* or overweight or obesity or nutrition*) NEAR/4 (therap* or manag* or treatment* or train* or guidance)) or ((health or "work abilit*") NEAR/2 (promot* or educat* or screen* or check-up* or assess* or counsel* or guidance* or motivation* or improv*)) or (weight NEAR/2 (control or management)) or sleep*

8 self-help or mindfulness or (behavio* NEAR/2 educat*) or self-esteem or ((mental or physical or social) NEAR/2 health) or "group session*" or "health behavio*" or "health coach*" or (health NEAR/2 intervention*)

9 4 or 5 or 6 or 7 or 8

10 3 and 9

11 (((unemploy* or jobless or ((out or lost) NEAR/1 (work* or job* or employ*))) and (long-time or long-term or longtime or longterm or "long time" or "long term"))):ti,ab

12 ((health* or exercis* or fitness or sport* or wellbeing or well-being or running or walking or swimming or weight* or train* or yoga or gymnastic* or cycling or bicycling or hiking or hiker* or relax* or sleep* or ((physical or indoor or outdoor) NEAR/2 activit*) or problem*)):ti,ab

13 (therap* or CBT or manag* or treatment* or train* or guidance* or depress* or worr* or panic or anxiety or stress or insomnia* or smoking or alcohol* or overweight or obesity or nutrition* or "work abilit*" or promot* or educat* or screen* or check-up* or assess* or counsel* or motivation* or improv*);ti,ab

14 (self-help or mindfulness or behavio* or self-esteem or "group session*");ti,ab

15 12 or 13 or 14

16 11 and 15

17 10 or 16

CONTRIBUTIONS OF AUTHORS

Conceiving the protocol: MH

Designing the protocol: MH, KL, TS, KR, CV, AB

Co-ordinating the protocol: MH

Designing search strategies: MH together with Kaisa Hartikainen and Heikki Laitinen from the University of Eastern Finland.

Writing the protocol: MH

Commenting on the protocol: KL, TS, KR, CV, AB

DECLARATIONS OF INTEREST

Marja Hult: None known.

Kirsi Lappalainen: None known.

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DIFFERENCES BETWEEN PROTOCOL AND REVIEW

We aimed at also including non-randomised studies in addition to RCTs. However, we decided to exclude non-randomised studies, because there were RCTs available. This made the analysis phase more coherent and the quality of evidence better. We aimed at excluding trials that focused on one patient group only. We added, however, participants who had common mental health problems, because prevalence of mental health problems is high among the study population and also in the general population.

In the protocol, we wrote: we will consider interventions as similar when they can be grouped as diagnostics, exercise, training, education, advising and counselling, psychotherapy, support and management or similar combinations of these components. However, we finally decided to combine all therapeutic interventions and all interventions that combined therapy with job-seeking support because there was very little difference between the therapeutic interventions.

INDEX TERMS**Medical Subject Headings (MeSH)**

*Cognitive Behavioral Therapy; *Employment; Exercise [*physiology]; Randomized Controlled Trials as Topic; Return to Work [*psychology]; Unemployment [*psychology]

MeSH check words

Humans