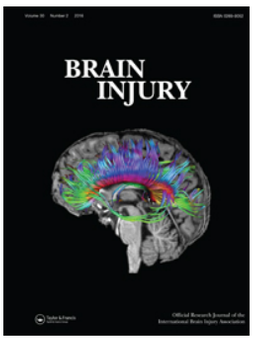

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REVIEW ARTICLE

Effective return-to-work interventions after acquired brain injury: A systematic review

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Abstract

Objective: To gather knowledge about effective return-to-work (RTW) interventions for patients with acquired brain injury (ABI).

Methods: A database search was performed in PubMed, EMBASE, PsycINFO, CINAHL and the Cochrane Library using keywords and Medical Subject Headings. Studies were included if they met inclusion criteria: adult patients with non-progressive ABI, working pre-injury and an intervention principally designed to improve RTW as an outcome. The methodological quality of included studies was determined and evidence was assessed qualitatively.

Results: Twelve studies were included, of which five were randomized controlled trials and seven were cohort studies. Nine studies had sufficient methodological quality. There is *strong evidence* that work-directed interventions in combination with education/coaching are effective regarding RTW and there are *indicative findings* for the effectiveness of work-directed interventions in combination with skills training and education/coaching. Reported components of the most effective interventions were tailored approach, early intervention, involvement of patient and employer, work or workplace accommodations, work practice and training of social and work-related skills, including coping and emotional support.

Conclusion and implications: Effective RTW interventions for patients with ABI are a combination of work-directed interventions, coaching/education and/or skills training. These interventions have the potential to facilitate sustained RTW for patients with ABI.

Keywords

Acquired brain injury, traumatic brain injury, stroke, vocational, rehabilitation, intervention, return-to-work

History

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Introduction

Acquired brain injury (ABI) is an injury to the brain that is not hereditary, congenital, degenerative or induced by birth trauma; it occurs after birth [1]. ABI includes both brain injuries with a traumatic cause and a non-traumatic cause, like stroke [1].

Just 30 years ago, 50% of all individuals diagnosed with ABI died [2]. Survival rates have increased in the recent years [3]: after traumatic ABI [4,5] and after stroke [6]. However, many patients with ABI experience long-term physical, cognitive, emotional and behavioural problems, forming a substantial obstacle to return-to-work (RTW) [3,7,8].

Regarding RTW, ABI is of major public concern, as it is estimated that 75% of patients with ABI are of working age [3]. ABI with a traumatic cause mostly occurs at a time when people are aiming for vocational goals [9]. Non-traumatic ABI is associated with increasing age, but also younger individuals experience having a stroke: approximately one in four individuals suffering a stroke are under the age of 65 [10,11].

RTW turns out to be a significant problem after ABI [4,12,13]. The proportion of patients post-stroke returning to work varies between 11–85% [12] and between 11–82% after traumatic ABI [13]. In a systematic review it was shown that only 40% of previously employed patients under the age of 65 years returned to work within 2 years of ABI [14].

Research demonstrates that work is an important element in the life of patients with ABI: both patients with a stroke or a traumatic brain injury acknowledge the meaning of work as providing a social environment and a sense of purpose [15].

Given the importance of RTW, it is essential that patients with ABI are assisted to return to work. However, little is known concerning how to support them to return to work. A few vocational rehabilitation programmes were described in the past, but evidence for the effectiveness of these interventions was limited [16]. Consequently, there is a lack of information about effective RTW interventions for patients with ABI. The aim of this study is, therefore, to gather knowledge about effective RTW interventions for patients with traumatic and non-traumatic ABI in a systematic way.

The research question is: what are effective RTW interventions for patients with traumatic and non-traumatic ABI?

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Methods

This research followed the guidelines laid out in the PRISMA-P 2015 statement for reporting systematic reviews [17].

Literature search

To collect literature about interventions that focus on RTW after acquired brain injury (ABI), the following databases were searched: PubMed, EMBASE, PsycINFO, CINAHL, the Cochrane Central Register of Controlled Trials (CENTRAL) and the Cochrane Library. The first author (BDC) and a clinical librarian (JGD) formulated the search in PubMed and adapted it to make it applicable for the other databases. The search strategy was determined by population, interventions and outcome variables using both keywords and Medical Subject Headings (MeSH) terms. The searches were limited to articles available in the English, French, German or Dutch language. All details of the search strategies and the search terms are presented in Appendix 1.

Study selection

Studies retrieved by the search were split into two parts, with each part being selected by an author pair (BDC with HW and BDC with MFD, respectively). The authors of each pair performed the study selection independently. In cases of doubt, a consensus meeting with a third author was arranged (MFD or HW, respectively). Studies were initially assessed for relevance to the topic on the basis of *title* and *abstract*. The following inclusion criteria were defined for selection: studies were published between January 2000 and March 2015 and the study population comprised adults with non-progressive ABI from any cause, as defined by the Brain Injury Association of America [1]. Furthermore, studies were selected if RTW or other varieties of participation were cited as an outcome in the title or abstract. Second, *full articles* were included if they met the following inclusion criteria: individuals were adults of working age (16–67 years) who had a paid job, irrespective of position or organization. Additionally, any article that reported research on interventions principally designed to improve RTW outcomes was included. RTW in this review was characterized as having part-time or full-time paid or supported employment without consideration of the job demands or working hours. Studies were included with the following designs: randomized and non-randomized controlled trials (RCTs), controlled clinical trials (CCTs), interrupted time series studies, historically controlled studies, case series, case control studies, cohort studies and longitudinal studies. Furthermore, reference lists of included studies and of selected reviews were hand-searched to find additional publications. These studies were included if they met inclusion criteria. A record of rejected studies and the reasons for rejection were documented.

Data extraction

The first author (BDC) extracted data using a data extraction form that included information on reference and geographic location, study design, population (intervention group and control group), the intervention and the control group treatment, follow-up period and effect of the intervention on RTW. Two authors (HW and MFD) each verified a random sample. In cases of disagreement, consensus was achieved through discussion (between BDC and HW or BDC and MFD, respectively). If data were missing, authors of the studies were contacted and additional information was requested.

Methodological quality assessment

The methodological quality of included RCTs and CCTs was evaluated using a list recommended by Van Tulder et al. [18] and Steultjens et al. [19]. The list consists of 11 criteria for internal validity, six descriptive criteria and two statistical criteria [19]. Criteria and specifications of the criteria are demonstrated in Appendix 2. All criteria were scored as 'yes', 'no' or 'unclear' [19]. If six or more criteria for internal validity, three descriptive criteria and one statistical criterion were scored positively, the study was judged to be of high quality.

The methodological quality of studies with designs other than RCTs and CCTs was also assessed by the list of van Tulder et al. [18] and Steultjens et al. [19], adapted and advocated by Steultjens et al. [19]. Items that were only applicable to RCTs or CCTs were removed or reformulated [19]. This resulted in a list containing seven criteria for internal validity, four descriptive criteria and two statistical criteria. Descriptions of the criteria are outlined in Appendix 2. These criteria were also scored as 'yes', 'no' or 'unclear'. A study was of sufficient quality if at least four criteria for internal validity, two descriptive criteria and one statistical criterion were scored positively [19].

The first author performed the assessment of the methodological quality independently; two authors (HW and MFD) replicated the assessment in a random sample. In cases of doubt, consensus was achieved through discussion (between BDC and HW or BDC and MFD, respectively).

Data synthesis

The interventions originating from studies with a sufficient methodological quality were described and, if possible, grouped according to their components. An intervention was assessed to be effective if the authors of the study demonstrated a significant effect of the intervention on RTW.

Level of evidence

If the included studies were sufficiently homogeneous, meta-analysis was to be conducted. However, if heterogeneity precluded quantitative synthesis, level of evidence for the effectiveness of the categorized interventions was determined qualitatively. Five levels of evidence were defined, based on Van Tulder et al. [20] and performed and adapted by other reviewers [19]. The different levels of evidence were the following: *strong evidence* provided by consistent, statistically significant findings in outcome measures in at least two high quality RCTs; *moderate evidence* provided by consistent, statistically significant findings in outcome measures in at least one high-quality RCT and at least one low-quality

RCT or high-quality CCT; *limited evidence* provided by statistically significant findings in outcome measures in at least one high-quality RCT or provided by consistent, statistically significant findings in outcome measures in at least two high-quality CCTs (in the absence of high-quality RCTs); *indicative findings* provided by statistically significant findings in outcome and/or process measures in at least one high-quality CCT or one low-quality RCT (in the absence of high-quality RCTs) or provided by consistent, statistically significant findings in outcome and/or process measures in at least two ODs with sufficient quality (in the absence of RCTs and CCTs) and *no evidence* in cases of results of eligible studies that do not meet the criteria for one of the above-stated levels of evidence or in case of conflicting results among RCTs and CCTs or in the case of no eligible studies [19,20].

Only results of studies contributing to the outcome of the best evidence synthesis, e.g. RCTs with a high methodological quality, low-quality RCTs with significant findings, high-quality CCTs with significant findings and high-quality ODs with significant findings are presented [19].

Results

Search results and study selection

Figure 1 shows the flowchart of the study selection process. The database search identified 5017 citations. After removing 967 duplicates, titles and abstracts of the remaining 4050 papers were examined for eligibility. A total of 40 articles were retrieved for full text selection, of which 11 met the inclusion criteria [21–31]. The most common reasons for exclusion were that the studies did not involve an intervention or did not report RTW as an outcome. If desired, a documentation of rejected studies and the reasons for rejection are available from the first author.

The reference lists of the 11 included articles were screened; no additional relevant studies were identified. The reference lists of four reviews that were retrieved by the search and fulfilled the inclusion criteria [7,16,32,33] were checked. One further article was detected and included [34], originating from one of these reviews [32]. As a result, the total number of studies included in this review was 12.

Study characteristics

The characteristics of the 12 included studies are presented in Appendix 3.

Five studies were randomized controlled trials (RCTs) [24,27,28,30,31]. Seven studies had 'other designs' (ODs): six were prospective cohort studies [21–23,25,26,29] and one study had a retrospective design [34].

Four of the six prospective studies had a controlled design: two studies with a control group [21,29], one study with waiting controls [26] and one with a 3-month waiting list control period [23].

Five studies were conducted in the US, five in European countries (two in the UK, two in the Netherlands, one in Finland), one in Hong Kong and one in South Africa.

Methodological quality assessment

The methodological quality of the selected studies was assessed: five RCTs and seven ODs. Four out of the five RCTs were rated as being of high quality [27,28,30,31] and five out of the seven ODs had sufficient quality [22,23,25,26,29]. The methodological quality score of the studies is presented in Appendix 4; it demonstrates positive scored items/criteria.

Study populations

Participants involved in the 12 included studies varied. Namely, five studies comprised patients with ABI [22,23,25,26,30]; five studies involved patients with traumatic brain injury (TBI) [21,24,28,29,31] and one study included stroke patients [27]. Another study involved patients with 'a variety of neurological problems' [34], a sub-group of this study population comprised patients with ABI, the results were reported separately.

Injury severity varied between studies: from mild and moderate [24] to severe [22] and very severe injury [25]. Study participants had only slight physical disabilities [29] or were classified as having a severe disability [21]. Due to a high diversity in study populations, regardless of the cause of injury, it was decided to analyse the data of the studies altogether.

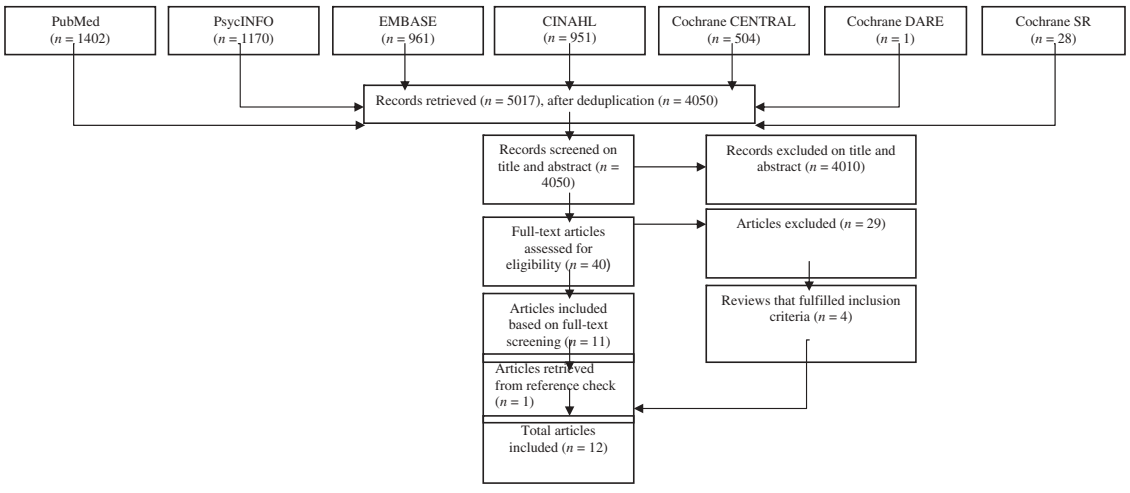

Figure 1. Flow chart of the study selection process.

Time since injury

There was a wide disparity in the time from onset of ABI to the start of the intervention: from less than 8 weeks [27] to several years after injury [22,25].

Outcomes

All studies reported RTW as the primary or secondary outcome measure. The definitions of RTW varied between studies, e.g. full-time or part-time gainful military or civilian employment [28] or work situation, namely having a paid job or not [23]. Data on RTW were obtained through questionnaires [27,29], interviews [22,31] or databases [25].

Follow-up

Follow-up duration varied from 90 days [21] to 24 months [28,29]. The last follow-up measurement was after 6 months in four studies [24,26,27,30] and after 1 year in three studies [22,23,31].

Interventions

All interventions described in the included studies were predominantly designed to improve RTW outcomes and comprised several components or a combination thereof. The effectiveness of these interventions is reported below. As the included studies showed diversity regarding population, intervention and outcome, it was not possible to pool the results. Consequently, level of evidence for the effectiveness of the interventions was evaluated qualitatively [19,20].

Work-directed intervention components and education/coaching

Ntsiea et al. [27] demonstrated in an RCT that a workplace intervention programme was effective regarding RTW [27]. Therapist, patient and employer developed a plan to overcome identified barriers for RTW. This plan was individual-specific and comprised adaptation and evaluation of the working tasks, hours and environment, vocational counselling, including coaching and advice on coping strategies [27]. After 6 months, stroke patients in the intervention group had 5.2 greater odds of returning to work than those in the control group (OR = 5.2; 95% CI = 1.8–15.0) [27].

Another RCT demonstrated the effectiveness of support during the RTW process, although the study population was small [30]. Patients in the intervention group were assigned to resource facilitators who assisted them to return to work, by identifying person-centred goals and facilitating access to resources for support and education. Services were provided in a variety of settings including the place of work [30]. The former employer was, when appropriate, engaged in an RTW plan [30]. At follow-up, 64% of the patients with ABI in the intervention group were employed (four full-time; three part-time), compared with 36% of the control group (three full-time; one part-time). The distributions of these ordinal data, i.e. full-time, part-time, unemployed, were significantly different between the two groups (Wald-Wolfkowitz $z = -3.277$, $p < 0.0001$) [30].

Both RCTs were assessed as being of sufficient quality [27,30]. Consequently, there is *strong* evidence that work-directed interventions combined with education and coaching are effective regarding RTW [27,30].

Skills training, education/coaching and work-directed intervention components

Two prospective cohort studies investigated the effectiveness of a residential community re-integration programme for patients with ABI and severe psychosocial problems [22,23]. This intervention involved training of coping strategies and social skills, education on the consequences of ABI, work practice and an assessment of working tasks, working hours and assistance or workplace adjustments required. One study with a 3-month waiting list control period demonstrated that the intervention significantly improved the work situation of the patients [23]. The other study was uncontrolled; it reported that the number of patients who were working increased, from nine to 14, and the hours of work per week increased from 8 to 15 [22]. Both prospective studies were considered to be of sufficient quality [22,23].

One retrospective cohort study reported a project that assisted patients with ABI to return to work [34]. Patients with ABI were helped to develop work-related skills, moved on to training courses and were placed in work [34]. An audit was conducted to review the progress, 18 out of 58 patients with ABI had returned to paid work [34]. The methodological quality of this retrospective study was not sufficient, however [34].

The two prospective studies generated *indicative findings* for the effectiveness of work-directed interventions in combination with skills training and education/coaching [22,23].

Cognitive rehabilitation, skills training education/coaching and work-directed intervention components

An RCT, having sufficient methodological quality, demonstrated no significant differences between patients in the intervention group or in the control group with respect to RTW [28]. An individualized neuropsychological sub-group rehabilitation programme, the so called INSURE programme, significantly enhanced productivity outcomes in a high-quality non-randomized controlled trial [29]. The programme comprised neuropsychological rehabilitation, education about TBI, psychotherapy and tailored support to find work [29]. The productive outcome of the treatment group was better and significantly different from that of the control group (OR = 6.96; 95% CI = 1.26–38.44; $p = 0.02$) [29]. Another high-quality prospective study presented a preliminary evaluation of the Rehab UK vocational rehabilitation programme [25]. Forty-one per cent of the patients gained paid competitive employment; however, the study was uncontrolled [25]. As a result, due to inconsistent findings, the three studies created *no evidence* for the effectiveness of work-directed interventions in combination with cognitive rehabilitation, skills training and education/coaching [25,28,29].

Skills training

A low-quality RCT investigated the effectiveness of artificial intelligent 3-D virtual reality vocational problem-solving training in enhancing employment opportunities; there were no significant differences between groups regarding job status [24]. A prospective study assessed to be of sufficient quality with waiting controls examined the effectiveness of a neuro-behavioural, employability-enhancing intervention, the Vocational Transitions Program [26]. After completion of the programme, marginal significant differences were reported between the intervention group and the control group regarding employment outcomes (Chi-square = 0.69, df = 1, $p = 0.41$) [26].

Consequently, there is *no evidence* for the effectiveness of skills training interventions.

Cognitive rehabilitation

A large high-quality RCT did not reveal significant differences in RTW outcomes between the intervention and the control group [31]. Consequently, there is *no evidence* for the effectiveness of this cognitive rehabilitation programme [31].

Supported employment

One prospective cohort study investigated the effectiveness of supported employment during vocational rehabilitation [21]. Patients who received supported employment services had significantly better competitive employment outcomes than those who were not provided supported employment services ($p < 0.003$) [21]. The methodological quality of the study was not sufficient [21]. As a result, there is *no evidence* for the effectiveness of supported employment services [21].

Discussion

The aim of this study was to gather knowledge about effective RTW interventions for patients with ABI. *Strong* evidence was found that interventions containing a combination of *work-directed components*, like adaptation of the working tasks, and *education and coaching*, like emotional support, are effective regarding RTW. This study presents *indicative findings* for the effectiveness of the aforementioned combination of components along with *skills training*, like social skills. Specifically, it was effective to focus on assisting patients with ABI during the RTW process, realizing tailored work adjustments and involving the employer. Therefore, paying attention to both the workplace and the employer seems to be important regarding RTW after ABI. The ultimate success of the intervention depends on the availability of the former job of the patient with ABI and the co-operation of the employer. Namely, chances to RTW are enhanced if the employer is offering a job and is willing to adapt the workplace and working tasks [27].

However, if unemployment has occurred, RTW is hampered as demonstrated in earlier research [4,35]. In this context it might be useful to consider job placements and, thereby, improving RTW outcomes along with work practice, work-related skills training and providing information [22,23,26].

Work-directed interventions are not only effective after ABI, but have also been proven to facilitate RTW in other illnesses [36–38]. Furthermore, it was found that the interventions were effective in patients with traumatic ABI as well as non-traumatic ABI; the cause of injury was not relevant [22,23,25–27,30]. Consequently, patients with ABI due to a traumatic or a non-traumatic cause could be considered as one population. Therefore, it seems that addressing work and workplace, as well as involving the employer, might improve RTW, regardless of illness or underlying cause of ABI.

Methodological considerations

A strength of this study is that a sensitive search was conducted in all relevant databases and that the search strategy was peer-reviewed by a clinical librarian.

The studies included in this review demonstrated highly heterogeneous populations and outcome measures. This heterogeneity precluded a meta-analysis; consequently, a qualitative evidence synthesis approach was applied. In order to do so, the interventions reported in the included studies were categorized according to the specific focus of the approach in relation to RTW, namely: (1) interventions that focus on *work or workplace issues*: work-directed interventions; (2) interventions focusing on the *patient*: education and coaching; (3) interventions focusing on *activity limitations* in order to enhance RTW: skills training; (4) interventions that included any type of treatment to improve *(cognitive) functioning* and chances of RTW: cognitive rehabilitation; (5) *placement in work* along with provision of *support* and *training* on the job: supported employment; and (6) *combinations* of these intervention components. This categorization complies with the International Classification of Functioning, Disability and Health (ICF model) [39]. The intention was to conduct a transparent review; therefore, the categorization of the interventions was discussed until consensus between all researchers involved was achieved.

Implications for research

The majority of the interventions comprised a great variety of components, while it remains to be determined which specific components are most effective and for whom. In order to establish the effectiveness of intervention components, more intervention studies are needed.

Conclusion

This study provides knowledge about effective RTW interventions for patients with ABI, having both a traumatic and a non-traumatic cause. Effective RTW interventions for patients with ABI are a combination of work-directed interventions, coaching/education and/or skills training. These interventions have the potential to facilitate RTW for patients with ABI.

Declaration of interest

The authors report no conflicts of interest. The authors alone are responsible for the content and writing of the paper.

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Appendix 1: Search terms and search strategies

Searches performed 12 March 2015.

PubMed

("Brain Diseases"[Mesh:noexp] OR "Akinetic Mutism"[Mesh] OR "Amnesia, Transient Global"[Mesh] OR "Auditory Diseases, Central"[Mesh] OR "Hearing Loss, Central"[Mesh] OR "Basal Ganglia Diseases"[Mesh] OR "Basal Ganglia Cerebrovascular Disease"[Mesh] OR "Chorea Gravidarum"[Mesh] OR "Dystonia Musculorum Deformans"[Mesh] OR "Meige Syndrome"[Mesh] OR "Multiple System Atrophy"[Mesh] OR "Neuroleptic Malignant Syndrome"[Mesh] OR "Tourette Syndrome"[Mesh] OR "Brain Abscess"[Mesh] OR "Toxoplasmosis, Cerebral"[Mesh] OR "Brain Damage, Chronic"[Mesh] OR "Brain Injury, Chronic"[Mesh] OR "Cerebral Palsy"[Mesh] OR "Persistent Vegetative State"[Mesh] OR "Brain Diseases, Metabolic"[Mesh] OR "Hepatic Encephalopathy"[Mesh] OR "Marchiafava-Bignami Disease"[Mesh] OR "Mitochondrial Encephalomyopathies"[Mesh] OR "Myelinolysis, Central Pontine"[Mesh] OR "Reye Syndrome"[Mesh] OR "Wernicke Encephalopathy"[Mesh] OR "Brain Edema"[Mesh] OR "Brain Injuries"[Mesh:noexp] OR "Brain Concussion"[Mesh] OR "Brain Hemorrhage, Traumatic"[Mesh] OR "Brain Injury, Chronic"[Mesh] OR "Diffuse Axonal Injury"[Mesh] OR "Epilepsy, Post-Traumatic"[Mesh] OR "Pneumocephalus"[Mesh] OR "Brain Neoplasms"[Mesh] OR "Cerebral Ventricle Neoplasms"[Mesh] OR "Infratentorial Neoplasms"[Mesh] OR "Neurocytoma"[Mesh] OR "Pinealoma"[Mesh] OR "Supratentorial Neoplasms"[Mesh] OR "Cerebellar Diseases"[Mesh:noexp] OR "Cerebellar Ataxia"[Mesh] OR "Cerebellar Neoplasms"[Mesh] OR "Miller Fisher Syndrome"[Mesh] OR "Cerebrovascular Disorders"[Mesh:noexp] OR "Basal Ganglia Cerebrovascular Disease"[Mesh] OR "Brain Ischemia"[Mesh] OR "Carotid Artery Diseases"[Mesh] OR "Cerebral Small Vessel Diseases"[Mesh] OR "Cerebrovascular Trauma"[Mesh] OR "Intracranial Arterial Diseases"[Mesh] OR "Intracranial Arteriovenous Malformations"[Mesh] OR "Intracranial Embolism and Thrombosis"[Mesh] OR "Intracranial Hemorrhages"[Mesh] OR "Sneddon Syndrome"[Mesh] OR "Stroke"[Mesh] OR "Susac Syndrome"[Mesh] OR "Vascular Headaches"[Mesh] OR "Vasculitis, Central Nervous System"[Mesh] OR "Vasospasm, Intracranial"[Mesh] OR "Vertebral Artery Dissection"[Mesh] OR "Diffuse Neurofibrillary Tangles with Calcification"[Mesh] OR "Kluver-Bucy Syndrome"[Mesh] OR "Lewy Body Disease"[Mesh] OR "Pick Disease of the Brain"[Mesh] OR "Encephalitis"[Mesh] OR "Anti-N-Methyl-D-Aspartate Receptor Encephalitis"[Mesh] OR "Cerebral Ventriculitis"[Mesh] OR "Encephalomyelitis"[Mesh] OR "Limbic Encephalitis"[Mesh] OR "Meningoencephalitis"[Mesh] OR "Encephalomalacia"[Mesh] OR "Leukomalacia, Periventricular"[Mesh] OR "Epilepsy"[Mesh:noexp] OR "Epilepsies, Myoclonic"[Mesh] OR "Epilepsies, Partial"[Mesh] OR "Epilepsy, Generalized"[Mesh] OR "Epilepsy, Post-Traumatic"[Mesh] OR "Epilepsy, Reflex"[Mesh] OR "Landau-Kleffner Syndrome"[Mesh] OR "Seizures"[Mesh] OR "Seizures, Febrile"[Mesh] OR "Status Epilepticus"[Mesh] OR "Headache Disorders"[Mesh:noexp] OR "Post-Traumatic Headache"[Mesh] OR "Hydrocephalus"[Mesh] OR "Hydrocephalus, Normal Pressure"[Mesh] OR "Hypothalamic Diseases"[Mesh] OR "Hypothalamic Neoplasms"[Mesh:noexp] OR "Pituitary Diseases"[Mesh] OR "Hypoxia, Brain"[Mesh] OR "Hypoxia-Ischemia, Brain"[Mesh] OR "Intracranial Hypertension"[Mesh:noexp] OR "Hydrocephalus"[Mesh] OR "Hypertensive Encephalopathy"[Mesh] OR "Pseudotumor Cerebri"[Mesh] OR "Intracranial Hypotension"[Mesh] OR "Kluver-Bucy Syndrome"[Mesh] OR "Leukoencephalopathies"[Mesh] OR "Posterior Leukoencephalopathy Syndrome"[Mesh] OR "Neuroaxonal Dystrophies"[Mesh] OR "Subdural Effusion"[Mesh] OR "Thalamic Diseases"[Mesh] OR Akinetic Mutism[tw] OR Transient Global Amnesia[tw] OR central auditory diseases [tw] OR central Hearing Loss[tw] OR (basal ganglia disease [tw] OR basal ganglia diseases[tw]) OR Basal Ganglia Cerebrovascular Disease[tw] OR Chorea Gravidarum[tw] OR Dystonia Musculorum Deformans[tw] OR Meige Syndrome [tw] OR Multiple System Atrophy[tw] OR Neuroleptic Malignant Syndrome[tw] OR Tourette Syndrome[tw] OR Brain Abscess[tw] OR Cerebral Toxoplasmosis[tw] OR Cerebral Palsy[tw] OR Persistent Vegetative State[tw] OR metabolic Brain Diseases[tw] OR Hepatic Encephalopathy[tw] OR Marchiafava-Bignami Disease[tw] OR Mitochondrial Encephalomyopathies[tw] OR Central Pontine Myelinolysis [tw] OR Reye Syndrome[tw] OR Wernicke Encephalopathy [tw] OR Brain Edema[tw] OR Brain Concussion[tw] OR Traumatic Brain Hemorrhage[tw] OR Diffuse Axonal Injury [tw] OR Post-Traumatic Epilepsy[tw] OR Pneumocephalus [tw] OR Brain Neoplasms[tw] OR cerebral ventricle neoplasms[tw] OR (infratentorial neoplasm[tw] OR infratentorial neoplasms[tw]) OR Neurocytoma[tw] OR Pinealoma[tw] OR (supratentorial neoplasm[tw] OR supratentorial neoplasms[tw]) OR (cerebellar disease[tw] OR cerebellar diseased[tw] OR cerebellar diseases[tw]) OR Cerebellar Ataxia[tw] OR (cerebellar neoplasm[tw] OR cerebellar neoplasms[tw]) OR (brain tumor [tw] OR brain tumorigenesis[tw] OR brain tumors[tw]) OR (brain neoplasm[tw] OR brain neoplasms[tw]) OR (intracranial neoplasm[tw] OR intracranial neoplasms[tw]) OR Miller Fisher Syndrome[tw] OR (cerebrovascular disorder[tw] OR cerebrovascular disorders[tw]) OR basal ganglia cerebrovascular disease[tw] OR Brain Ischemia[tw] OR (carotid artery disease[tw] OR carotid artery disease,[tw] OR carotid artery diseases[tw]) OR (cerebral small vessel disease[tw] OR cerebral small vessel diseases[tw]) OR Cerebrovascular Trauma[tw] OR (intracranial arterial disease[tw] OR intracranial arterial diseases[tw]) OR (intracranial arteriovenous malformation[tw] OR intracranial arteriovenous malformations[tw]) OR Intracranial Embolism [tw] OR (intracranial thromboses[tw] OR intracranial thrombosis[tw]) OR (intracranial hemorrhage[tw] OR intracranial hemorrhages[tw]) OR Sneddon Syndrome[tw] OR Stroke[tw] OR cerebrovascular accident[tw] OR cva[tw] OR Susac Syndrome[tw] OR (vascular headache[tw] OR vascular headaches[tw]) OR Cerebral Vasculitis[tw] OR Intracranial Vasospasm[tw] OR Vertebral Artery Dissection[tw] OR Diffuse Neurofibrillary Tangles with Calcification[tw] OR Kluver-Bucy Syndrome[tw] OR Lewy Body Disease[tw] OR

"Pick Disease of the Brain"[tw] OR (cerebral scleroses[tw] OR cerebral sclerosis[tw]) OR Encephalitis[tw] OR Cerebral Ventriculitis[tw] OR Encephalomyelitis[tw] OR Limbic Encephalitis[tw] OR Meningoencephalitis[tw] OR Encephalomalacia[tw] OR Leukomalacia[tw] OR (epilep[tw] OR epilepax[tw] OR epilepay[tw] OR epilepcy[tw] OR epilepetic[tw] OR epilepetogenic[tw] OR epilepgraine[tw] OR epilepic[tw] OR epilepicus[tw] OR epilepiform[tw] OR epilepitc [tw] OR epilepitcus[tw] OR epilepitic[tw] OR epilepitus[tw] OR epilepleptogenic[tw] OR epilepraria[tw] OR epilepse[tw] OR epilepsi[tw] OR epilepsia[tw] OR epilepsia's[tw] OR epilepsiae[tw] OR epilepsiapartialis[tw] OR epilepsias[tw] OR epilepsics[tw] OR epilepsie[tw] OR epilepsie'[tw] OR epilepsiebestrijding[tw] OR epilepsiecentrum[tw] OR epilepsiechirurgie[tw] OR epilepsied[tw] OR epilepsiediagnostik[tw] OR epilepsien[tw] OR epilepsiepatienten[tw] OR epilepsies[tw] OR epilepsies'[tw] OR epilepsietherapie[tw] OR epilepsiezentrum[tw] OR epilepsiform[tw] OR epilepsihospitalet[tw] OR epilepsis[tw] OR epilepsiy[tw] OR epilepstic[tw] OR epilepsticus[tw] OR epilepsu[tw] OR epilepsy[tw] OR epilepsy'[tw] OR epilepsy''[tw] OR epilepsy's[tw] OR epilepsyand[tw] OR epilepsycases[tw] OR epilepsyfoundation[tw] OR epilepsyil[tw] OR epilepsymst[tw] OR epilepsyontology[tw] OR epilepsypsychoses[tw] OR epilepsys[tw] OR epilept[tw] OR epileptagenic [tw] OR epileptasid[tw] OR epileptc[tw] OR epileptform[tw] OR epilepti[tw] OR epileptia[tw] OR epileptic[tw] OR epileptic'[tw] OR epileptic's[tw] OR epileptica[tw] OR epileptica'[tw] OR epileptical[tw] OR epileptically[tw] OR epilepticas[tw] OR epilepticdrugs[tw] OR epileptici[tw] OR epilepticism[tw] OR epileptick[tw] OR epileptico[tw] OR epilepticogenic[tw] OR epilepticos[tw] OR epilepticpathological[tw] OR epileptics[tw] OR epileptics'[tw] OR epilepticseizure[tw] OR epilepticus[tw] OR epilepticus'[tw] OR epilepticusas[tw] OR epileptid[tw] OR epileptieus[tw] OR epileptifiorm[tw] OR epileptifom[tw] OR epileptiform[tw] OR epileptiform'[tw] OR epileptiformal[tw] OR epileptiforme[tw] OR epileptiformed[tw] OR epileptiformes[tw] OR epileptiformfindings[tw] OR epileptiformic[tw] OR epileptiforms[tw] OR epileptifors[tw] OR epileptigen[tw] OR epileptigenic[tw] OR epileptilorm[tw] OR epileptimorph [tw] OR epileptiod[tw] OR epileptioform[tw] OR epileptique [tw] OR epileptiques[tw] OR epileptiques'[tw] OR epileptis[tw] OR epileptisation[tw] OR epileptisch[tw] OR epileptische[tw] OR epileptius[tw] OR epileptization[tw] OR epileptize[tw] OR epileptized[tw] OR epileptizing[tw] OR epilepto[tw] OR epileptocentric[tw] OR epileptofirm[tw] OR epileptoform[tw] OR epileptoformic[tw] OR epileptogen[tw] OR epileptogencity[tw] OR epileptogene[tw] OR epileptogenecity[tw] OR epileptogeneic[tw] OR epileptogeneity[tw] OR epileptogeneses[tw] OR epileptogenesis[tw] OR epileptogenesis'[tw] OR epileptogenesity[tw] OR epileptogenetic[tw] OR epileptogenic[tw] OR epileptogenic'[tw] OR epileptogenicity[tw] OR epileptogenics [tw] OR epileptogenisis[tw] OR epileptogenisity[tw] OR epileptogenity[tw] OR epileptogenous[tw] OR epileptogens[tw] OR epileptogensis[tw] OR epileptogeny[tw] OR epileptogeonic[tw] OR epileptogesis[tw] OR epileptographic[tw] OR epileptohenesis[tw] OR epileptohenezu[tw] OR epileptoid[tw] OR epileptoidal[tw] OR epileptoidicity[tw] OR epileptoidism[tw] OR epileptoidity[tw] OR epileptoidness[tw] OR epileptojenic [tw] OR epileptolgist[tw] OR epileptologia[tw] OR epileptologic[tw] OR epileptological[tw] OR epileptologically[tw] OR epileptologie[tw] OR epileptologist[tw] OR epileptologist's [tw] OR epileptologists[tw] OR epileptologists'[tw] OR epileptology[tw] OR epileptology'[tw] OR epileptology's[tw] OR epileptomas[tw] OR epileptor[tw] OR epileptosis[tw] OR epileptostatic[tw] OR epileptosurgical[tw] OR epileptrogenesis [tw] OR epileptucus[tw] OR epileptus[tw] OR epilepy[tw]) OR Landau-Kleffner Syndrome[tw] OR Hydrocephalus[tw] OR (hypothalamic disease[tw] OR hypothalamic diseases[tw]) OR (hypothalamic neoplasm[tw] OR hypothalamic neoplasms [tw]) OR (pituitary disease[tw] OR pituitary diseases[tw]) OR Brain Hypoxia[tw] OR hypoxic[tw] OR anoxia[tw] OR Intracranial Hypertension[tw] OR Hypertensive Encephalopathy[tw] OR Pseudotumor Cerebri[tw] OR Intracranial Hypotension[tw] OR Kluver-Bucy Syndrome[tw] OR Leukoencephalopathies[tw] OR leukoencephalopathy[tw] OR Neuroaxonal Dystrophies[tw] OR Subdural Effusion[tw] OR (thalamic disease[tw] OR thalamic diseases[tw]) OR "Meningitis"[Mesh] OR meningitis[tw] OR "Brain Injuries"[Mesh] OR (brain injure[tw] OR brain injured[tw] OR brain injures[tw] OR brain injuried[tw] OR brain injuries[tw] OR brain injury[tw] OR brain injury,[tw]) OR craniocerebral trauma[tw] OR tbi[ti])

AND

("Return to Work"[Mesh] OR ("return to"[tw] AND (job [tw] OR work[tw] OR employment[tw])) OR "back to work"[tw] OR "Unemployment"[Mesh] OR unemployment [tw] OR "Employment"[Mesh] OR (employment[tw] AND status[tw]) OR employability[tw] OR work status[tw] OR work resumption[tw] OR working age[tw])

AND

("Rehabilitation, Vocational"[Mesh] OR (vocational rehab [tw] OR vocational rehabilitation[tw] OR vocational rehabilitationists[tw] OR vocational rehabiltiation[tw]) OR vocational reintegration[tw] OR vocational integration[tw] OR vocational recovery[tw] OR (vocational intervention[tw] OR vocational interventions[tw]) OR (vocational trainee[tw] OR vocational trainees[tw] OR vocational trainer[tw] OR vocational trainers[tw] OR vocational training[tw]) OR Therapy/Narrow[filter] OR treatment[tw] OR (therap[tw] OR therapaeutic[tw] OR therapak[tw] OR therapatic[tw] OR therapautic[tw] OR therapax[tw] OR therapay[tw] OR therapcutic[tw] OR therapeatic[tw] OR therapeautic[tw] OR therapeautical [tw] OR therapeautics[tw] OR therapecuical[tw] OR therapeeutic[tw] OR therapehtic[tw] OR therapeia[tw] OR therapeies[tw] OR therapeis[tw] OR therapeituc[tw] OR therapentic[tw] OR therapentical[tw] OR therapeogenic[tw] OR therapeomic[tw] OR therapeopathology[tw] OR therapep [tw] OR therapertic[tw] OR therapestic[tw] OR therapetic[tw] OR therapetical[tw] OR therapetitic[tw] OR therapets[tw] OR therapetuic[tw] OR therapeu[tw] OR therapeuatic[tw] OR therapeuctic[tw] OR therapeudic[tw] OR therapeuetic[tw] OR therapeufic[tw] OR therapeugenic[tw] OR therapeuic [tw] OR therapeuitc[tw] OR therapeuitcs[tw] OR therapeuitic[tw] OR therapeulic[tw] OR therapeuratic[tw] OR therapeuric[tw] OR therapeusis[tw] OR therapeustic[tw] OR therapeut[tw] OR therapeut's[tw] OR therapeutae[tw] OR therapeutae'[tw] OR therapeutant[tw] OR therapeutants[tw] OR therapeutc[tw] OR therapeutcal[tw] OR therapeute[tw] OR therapeuted[tw] OR therapeuten[tw] OR therapeutes[tw] OR therapeuthic[tw] OR therapeuthical[tw] OR

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therapyfuture[tw] OR therapygenetic[tw] OR therapygenetics[tw] OR therapygin[tw] OR therapygkrs[tw] OR therapygtr[tw] OR therapyh[tw] OR therapyhave[tw] OR therapyi[tw] OR therapyibut[tw] OR therapyies[tw] OR therapyimatinibsunitinibnew[tw] OR therapyincludes[tw] OR therapyincluding[tw] OR therapyinduced[tw] OR therapying[tw] OR therapyintervention[tw] OR therapyinterventions[tw] OR therapyinvolved[tw] OR therapyiqr[tw] OR therapyis[tw] OR therapyists[tw] OR therapyl[tw] OR therapylike[tw] OR therapymetabolic[tw] OR therapymethodologypsycho[tw] OR therapymilan[tw] OR therapyn[tw] OR therapynaive[tw] OR therapynew[tw] OR therapyof[tw] OR therapyon[tw] OR therapyper[tw] OR therapyplatelet[tw] OR therapyplus[tw] OR therapypredictive[tw] OR therapyprogram[tw] OR therapyrelated[tw] OR therapyrelevant[tw] OR therapyresistance[tw] OR therapyresistant[tw] OR therapyresistent[tw] OR therapys[tw] OR therapysalvage[tw] OR therapyselective[tw] OR therapyself[tw] OR therapysignificantly[tw] OR therapyspatially[tw] OR therapyspecial[tw] OR therapysrs[tw] OR therapystart[tw] OR therapystop[tw] OR therapystudies[tw] OR therapysystemic[tw] OR therapytargeted[tw] OR therapytechnique[tw] OR therapythe[tw] OR therapytm[tw] OR therapytrade[tw] OR therapyusing[tw] OR therapywhat[tw] OR therapywith[tw]) OR "therapy"[Subheading])

AND

(English[lang] OR Dutch[lang] OR French[lang] OR German[lang])

EMBASE

(1) acute brain disease/ or brain cortex lesion/ or brain cyst/ or brain edema/ or brain hypoxia/ or exp brain infection/

or brain pseudotumor/ or brain toxicity/ or exp brain tumor/ or cerebral blindness/ or cerebral salt wasting/ or exp cerebrovascular disease/ or colloid cyst/ or dialysis encephalopathy/ or exp encephalitis/ or encephalomalacia/ or exp extrapyramidal syndrome/ or hashimoto encephalopathy/ or heat stroke/ or hypertension encephalopathy/ or exp intracranial hypertension/ or intracranial hypotension/ or exp metabolic encephalopathy/ or organic brain syndrome/ or organic psychosyndrome/ or pneumocephalus/ or exp "seizure, epilepsy and convulsion"/

(2) exp cerebrovascular accident/
(3) exp cerebrovascular disease/
(4) meningitis/
(5) brain embolism/
(6) (Akinetic Mutism or Transient Global Amnesia or central Auditory Disease* or central Hearing Loss or Basal Ganglia Disease* or Basal Ganglia Cerebrovascular Disease or Chorea Gravidarum or Dystonia Musculorum Deformans or Meige Syndrome or Multiple System Atrophy or Neuroleptic Malignant Syndrome or Pantothenate Kinase-Associated Neurodegeneration or Parkinsonian Disorder* or Tourette Syndrome or Brain Abscess or Cerebral Toxoplasmosis or Cerebral Palsy or Persistent Vegetative State or metabolic Brain Diseases or Hepatic Encephalopathy or Marchiafava-Bignami Disease or Mitochondrial Encephalomyopathies or Central Pontine Myelinolysis or Reye Syndrome or Wernicke Encephalopathy or Brain Edema or Brain Concussion or Traumatic Brain Hemorrhage or Diffuse Axonal Injury or Post-Traumatic Epilepsy or Pneumocephalus or Brain Neoplasms or Cerebral Ventricle Neoplasm* or Infratentorial Neoplasm* or Neurocytoma or Pinealoma or Supratentorial Neoplasm* or Cerebellar Disease* or Cerebellar Ataxia or Cerebellar Neoplasm* or brain tumor* or brain neoplasm* or intracranial neoplasm* or Miller Fisher Syndrome or Cerebrovascular Disorder* or Basal Ganglia Cerebrovascular Disease* or Brain Ischemia or Carotid Artery Disease* or Cerebral Small Vessel Disease* or Intracranial Arterial Disease* or Intracranial Arteriovenous Malformation* or Intracranial Embolism or intracranial Thrombos* or Intracranial Hemorrhage* or Sneddon Syndrome or Stroke or cerebrovascular accident or cva or Susac Syndrome or Vascular Headache* or Cerebral Vasculitis or Intracranial Vasospasm or Vertebral Artery Dissection or Diffuse Neurofibrillary Tangles with Calcification or Kluver-Bucy Syndrome or Lewy Body Disease or "Pick Disease of the Brain" or Cerebral Scleros* or Encephalitis or Cerebral Ventriculitis or Encephalomyelitis or Limbic Encephalitis or Meningoencephalitis or Encephalomalacia or Leukomalacia or Epilep* or Landau-Kleffner Syndrome or Hydrocephalus or Hypothalamic Disease* or Hypothalamic Neoplasm* or Pituitary Disease* or Brain Hypoxia or hypoxic or anoxia or Intracranial Hypertension or Hypertensive Encephalopathy or Pseudotumor Cerebri or Intracranial Hypotension or Kluver-Bucy Syndrome or Leukoencephalopath* or Demyelinating Autoimmune Disease* or Posterior Leukoencephalopathy Syndrome or Neuroaxonal Dystrophies or Subdural Effusion or Thalamic Disease* or meningitis or brain injur* or craniocerebral trauma or tbi or abi).ab,kw,ti. Insert Search Statement Edit Search Statement Delete Search Statement
(7) brain.mp. and neurotoxicity/
(8) (brain adj3 toxic*).ab,kw,ti.
(9) 7 or 8
(10) 1 or 2 or 3 or 4 or 5 or 6 or 9 [population]
(11) exp employment/ or unemployment/ or employability/ or voluntary worker/ or return to work/
(12) ((employment and status) or unemployment or employability or occupation* or working age).ab,kw,ti.
(13) ("return to" adj3 (work or job or employment)).ab,kw,ti.
(14) or/11–13 [Return to Work]
(15) vocational rehabilitation/
(16) (vocational adj1 (rehab* or intervention? or reintegration or integration or recovery or training)).ab,kw,ti.
(17) 15 or 16 [vocational rehabilitation]
(18) (integration program* or reintegration program*).ab,kw,ti.
(19) randomized controlled trial/
(20) (randomized and controlled and trial).ab,ti.
(21) or/17–20 [therapy - 1]
(22) 10 and 14 and 21 [final search part 1]
(23) 10 and 14
(24) limit 23 to "therapy (maximizes specificity)"
(25) 22 or 24 [final search]
(26) limit 25 to (article or conference abstract or conference paper or conference proceeding or "conference review" or report or "review")
(27) remove duplicates from 26 [remove duplicates from 24]

PsycINFO

(1) brain disorders/ or acute alcoholic intoxication/ or exp aphasia/ or athetosis/ or balint's syndrome/ or brain neoplasms/ or cerebrovascular accidents/ or chronic alcoholic intoxication/ or dysexecutive syndrome/ or exp encephalitis/ or exp epilepsy/ or exp epileptic seizures/ or general paresis/ or intracranial abscesses/ or kluver bucy syndrome/ or tay sachs disease/ or exp meningitis/
(2) (Akinetic Mutism or Transient Global Amnesia or central Auditory Disease* or central Hearing Loss or Basal Ganglia Disease* or Basal Ganglia Cerebrovascular Disease or Chorea Gravidarum or Dystonia Musculorum Deformans or Meige Syndrome or Multiple System Atrophy or Neuroleptic Malignant Syndrome or Pantothenate Kinase-Associated Neurodegeneration or Parkinsonian Disorder* or Tourette Syndrome or Brain Abscess or Cerebral Toxoplasmosis or Cerebral Palsy or Persistent Vegetative State or metabolic Brain Diseases or Hepatic Encephalopathy or Marchiafava-Bignami Disease or Mitochondrial Encephalomyopathies or Central Pontine Myelinolysis or Reye Syndrome or Wernicke Encephalopathy or Brain Edema or Brain Concussion or Traumatic Brain Hemorrhage or Diffuse Axonal Injury or Post-Traumatic Epilepsy or Pneumocephalus or Brain Neoplasms or Cerebral

Ventricle Neoplasm* or Infratentorial Neoplasm* or Neurocytoma or Pinealoma or Supratentorial Neoplasm* or Cerebellar Disease* or Cerebellar Ataxia or Cerebellar Neoplasm* or brain tumor* or brain neoplasm* or intracranial neoplasm* or Miller Fisher Syndrome or Cerebrovascular Disorder* or Basal Ganglia Cerebrovascular Disease* or Brain Ischemia or Carotid Artery Disease* or Cerebral Small Vessel Disease* or Intracranial Arterial Disease* or Intracranial Arteriovenous Malformation* or Intracranial Embolism or intracranial Thrombos* or Intracranial Hemorrhage* or Sneddon Syndrome or Stroke or cerebrovascular accident or cva or Susac Syndrome or Vascular Headache* or Cerebral Vasculitis or Intracranial Vasospasm or Vertebral Artery Dissection or Diffuse Neurofibrillary Tangles with Calcification or Kluver-Bucy Syndrome or Lewy Body Disease or "Pick Disease of the Brain" or Cerebral Scleros* or Encephalitis or Cerebral Ventriculitis or Encephalomyelitis or Limbic Encephalitis or Meningoencephalitis or Encephalomalacia or Leukomalacia or Epilep* or Landau-Kleffner Syndrome or Hydrocephalus or Hypothalamic Disease* or Hypothalamic Neoplasm* or Pituitary Disease* or Brain Hypoxia or hypoxic or anoxia or Intracranial Hypertension or Hypertensive Encephalopathy or Pseudotumor Cerebri or Intracranial Hypotension or Kluver-Bucy Syndrome or Leukoencephalopath* or Demyelinating Autoimmune Disease* or Posterior Leukoencephalopathy Syndrome or Neuroaxonal Dystrophies or Subdural Effusion or Thalamic Disease* or meningitis or brain injur* or craniocerebral trauma or tbi or abi).ab,id,ti.

(3) brain.mp. and neurotoxicity/
(4) (brain adj3 toxic*).ab,id,ti.
(5) or/1–4 [population]
(6) employment status/ or unemployment/ or employability/ or reemployment/
(7) ((employment and status) or unemployment or employability or reemployment or occupation* or working age).ab,id,ti.
(8) ("return to" adj3 (job or work or employment)).ab,id,ti.
(9) or/6–8 [return to work]
(10) exp vocational rehabilitation/
(11) (vocational adj1 (rehab* or intervention? or integration or reintegration or recovery or training)).ab,id,ti.
(12) 10 or 11 [vocational rehabilitation]
(13) random:.tw.
(14) placebo:.mp.
(15) double-blind:.tw.
(16) exp treatment/
(17) 33*.cc.
(18) or/13–17 [therapy]
(19) 5 and 9 and 12
(20) 5 and 9 and 18
(21) 19 or 20
(22) limit 21 to (("0100 journal" or "0110 peer-reviewed journal" or "0120 non-peer-reviewed journal" or "0130 peer-reviewed status unknown" or "0400 dissertation abstract" or "0500 electronic collection") and (dutch or english or french or german))

CINAHL

(S1) SU Akinetic Mutism or Transient Global Amnesia or central Auditory Disease* or central Hearing Loss or Basal Ganglia Disease* or Basal Ganglia Cerebrovascular Disease or Chorea Gravidarum or Dystonia Musculorum Deformans or Meige Syndrome or Multiple System Atrophy or Neuroleptic Malignant Syndrome or Pantothenate Kinase-Associated Neurodegeneration or Parkinsonian Disorder* or Tourette Syndrome or Brain Abscess or Cerebral Toxoplasmosis or Cerebral Palsy or Persistent Vegetative State or metabolic Brain Diseases or Hepatic Encephalopathy or Marchiafava-Bignami Disease or Mitochondrial Encephalomyopathies or Central Pontine Myelinolysis or Reye Syndrome or Wernicke Encephalopathy or Brain Edema or Brain Concussion or Traumatic Brain Hemorrhage or Diffuse Axonal Injury or Post-Traumatic Epilepsy or Pneumocephalus or Brain Neoplasms or Cerebral Ventricle Neoplasm* or Infratentorial Neoplasm* or Neurocytoma or Pinealoma or Supratentorial Neoplasm* or Cerebellar Disease* or Cerebellar Ataxia or Cerebellar Neoplasm* or brain tumor* or brain neoplasm* or intracranial neoplasm* or Miller Fisher Syndrome or Cerebrovascular Disorder* or Basal Ganglia Cerebrovascular Disease* or Brain Ischemia or Carotid Artery Disease* or Cerebral Small Vessel Disease* or Intracranial Arterial Disease* or Intracranial Arteriovenous Malformation* or Intracranial Embolism or intracranial Thrombos* or Intracranial Hemorrhage* or Sneddon Syndrome or Stroke or cerebrovascular accident or cva or Susac Syndrome or Vascular Headache* or Cerebral Vasculitis or Intracranial Vasospasm or Vertebral Artery Dissection or Diffuse Neurofibrillary Tangles with Calcification or Kluver-Bucy Syndrome or Lewy Body Disease or "Pick Disease of the Brain" or Cerebral Scleros* or Encephalitis or Cerebral Ventriculitis or Encephalomyelitis or Limbic Encephalitis or Meningoencephalitis or Encephalomalacia or Leukomalacia or Epilep* or Landau-Kleffner Syndrome or Hydrocephalus or Hypothalamic Disease* or Hypothalamic Neoplasm* or Pituitary Disease* or Brain Hypoxia or hypoxic or anoxia or Intracranial Hypertension or Hypertensive Encephalopathy or Pseudotumor Cerebri or Intracranial Hypotension or Kluver-Bucy Syndrome or Leukoencephalopath* or Demyelinating Autoimmune Disease* or Posterior Leukoencephalopathy Syndrome or Neuroaxonal Dystrophies or Subdural Effusion or Thalamic Disease* or meningitis or brain injur* or craniocerebral trauma or tbi or abi
(S2) (MH "Employment+")
(S3) (MH "Job Re-Entry")
(S4) TI (employment AND status) OR unemployment OR employability OR reemployment OR working age OR job reentry OR job re entry OR return to work

(S5) AB employment OR unemployment OR employability OR reemployment OR working age OR job reentry OR job re entry OR return to work
(S6) S2 OR S3 OR S4 OR S5
(S7) (MH "Rehabilitation, Vocational") OR SU vocational intervention OR SU vocational rehab* OR TI vocational intervention OR TI vocational rehab* OR AB vocational intervention OR AB vocational rehab* OR SU vocational reintegration OR TI vocational reintegration OR AB vocational reintegration OR SU vocational integration OR TI vocational integration OR AB vocational integration OR SU vocational recovery OR TI vocational recovery OR AB vocational recovery OR SU vocational training OR TI vocational training OR AB vocational training
(S8) SU therapy or treatment
(S9) S7 OR S8
(S10) S1 AND S6 AND S9
(S11) S1 AND S6
(S12) S10 OR S11

Dutch/Flemish, English, French, German

Cochrane Library

(Akinetic Mutism or Transient Global Amnesia or central Auditory Disease* or central Hearing Loss or Basal Ganglia Disease* or Basal Ganglia Cerebrovascular Disease or Chorea Gravidarum or Dystonia Musculorum Deformans or Meige Syndrome or Multiple System Atrophy or Neuroleptic Malignant Syndrome or Pantothenate Kinase-Associated Neurodegeneration or Parkinsonian Disorder* or Tourette Syndrome or Brain Abscess or Cerebral Toxoplasmosis or Cerebral Palsy or Persistent Vegetative State or metabolic Brain Diseases or Hepatic Encephalopathy or Marchiafava-Bignami Disease or Mitochondrial Encephalomyopathies or Central Pontine Myelinolysis or Reye Syndrome or Wernicke Encephalopathy or Brain Edema or Brain Concussion or Traumatic Brain Hemorrhage or Diffuse Axonal Injury or Post-Traumatic Epilepsy or Pneumocephalus or Brain Neoplasms or Cerebral Ventricle Neoplasm* or Infratentorial Neoplasm* or Neurocytoma or Pinealoma or Supratentorial Neoplasm* or Cerebellar Disease* or Cerebellar Ataxia or Cerebellar Neoplasm* or brain tumor* or brain neoplasm* or intracranial neoplasm* or Miller Fisher Syndrome or Cerebrovascular Disorder* or Basal Ganglia Cerebrovascular Disease* or Brain Ischemia or Carotid Artery Disease* or Cerebral Small Vessel Disease* or Intracranial Arterial Disease* or Intracranial Arteriovenous Malformation* or Intracranial Embolism or intracranial Thrombos* or Intracranial Hemorrhage* or Sneddon Syndrome or Stroke or cerebrovascular accident or cva or Susac Syndrome or Vascular Headache* or Cerebral Vasculitis or Intracranial Vasospasm or Vertebral Artery Dissection or Diffuse Neurofibrillary Tangles with Calcification or Kluver-Bucy Syndrome or Lewy Body Disease or "Pick Disease of the Brain" or Cerebral Scleros* or Encephalitis or Cerebral Ventriculitis or Encephalomyelitis or Limbic Encephalitis or Meningoencephalitis or Encephalomalacia or Leukomalacia or Epilep* or Landau-Kleffner Syndrome or Hydrocephalus or Hypothalamic Disease* or Hypothalamic Neoplasm* or Pituitary Disease* or Brain Hypoxia or hypoxic or anoxia or Intracranial Hypertension or Hypertensive Encephalopathy or Pseudotumor Cerebri or Intracranial Hypotension or Kluver-Bucy Syndrome or Leukoencephalopath* or Demyelinating Autoimmune Disease* or Posterior Leukoencephalopathy Syndrome or Neuroaxonal Dystrophies or Subdural Effusion or Thalamic Disease* or meningitis or brain injur* or craniocerebral trauma or tbi or abi)

and

(employment or unemployment or employability or reemployment or working age or return to work or job reentry or job re entry)

and

(vocational rehab* or vocational reintegration or vocational integration or vocational recovery or vocational intervention* or vocational train* or treatment or therap*):ti,ab,kw (Word variations have been searched).

Appendix 2: Criteria of methodological quality* [18,19]

Randomized Clinical Trials (RCTs), Controlled Clinical Trials (CCTs)

Patient selection
(a) were the eligibility criteria specified?
(b) treatment allocation:
  (1) was a method of randomization performed?
  (2) was the treatment allocation concealed?
(c) were the groups similar at baseline?

Interventions
(d) were the index and control interventions explicitly described?
(e) was the care provider blinded for the intervention?
(f) were co-interventions avoided or comparable?
(g) was the compliance acceptable in all groups?
(h) was the patient blinded to the intervention?

Outcome measurement
(i) was the outcome assessor blinded to the interventions?
(j) were the outcome measures relevant?
(k) were adverse effects described?
(l) was the withdrawal/drop-out rate described and acceptable?
(m) timing follow-up measurements:
  (1) was a short-term follow-up measurement performed?
  (2) was a long-term follow-up measurement performed?
(n) was the timing of the outcome assessment in both groups comparable?

Statistics
(o) was the sample size for each group described?
(p) did the analysis include an intention-to-treat analysis?
(q) were point estimates and measures or variability presented for the primary outcome measures?

Other than controlled design (OD)

Patient selection
(a) were the eligibility criteria specified?

Interventions

(d) was the intervention explicitly described?
(f) were co-interventions avoided?
(g) was the compliance acceptable?
Outcome measurement
(i) Was the outcome assessor not involved in the treatment?
(j) were the outcome measures relevant?
(k) were adverse effects described?
(l) was the withdrawal/drop-out rate described and acceptable?
(m) timing follow-up measurements:
  (1) was a short-term follow-up measurement performed?
  (2) was a long-term follow-up measurement performed?
(n) was the timing of the outcome assessment in all patients comparable?
Statistics
(o) was the sample size of the patient group described?
(p) did the analysis include an intention-to-treat analysis?
(q) were point estimates and measures or variability presented for the primary outcome measures?

* Internal validity: b, e, f, g, h, i, j, l, n, p; descriptive criteria: a, c, d, k, m; statistical criteria: o, q.

Specification of the criteria for methodological quality [18, 19]

(a) In order to score a 'yes' details about ABI should be reported.
(b1) A random (unpredictable) assignment sequence. Methods of allocation using date of birth, date of admission, hospital numbers or alternation should not be regarded as appropriate.
(b2) Assignment generated by an independent person not responsible for determining eligibility of the patients. This person has no information about the persons included in the trial and has no influence on the assignment sequence or the decision about eligibility of the patient.
(c) In order to receive a 'yes' groups have to be similar regarding: age, duration of disease, severeness of disease, baseline main outcome measure(s). If a baseline difference exists in one of these factors, a 'no' applies.
(d) Adequate description of type, modality, application technique, intensity, duration, number of frequency of sessions for both the experimental interventions and control intervention(s) in order to replicate the study.
(e) The reviewer determines when enough information about the blinding is given in order to score a 'yes'.
(f) Co-interventions concerning other similar interventions are avoided or either standardized.
(g) The reviewer determines when the compliance to the interventions is acceptable when based on the reported intensity, duration, number and frequency of sessions for the experimental intervention and the control intervention (s). Criterion compliance > 70% in all groups.
(h) The reviewer determines (per outcome parameter) when enough information about blinding is given to score a 'yes'.
(i) The reviewer determines when enough information about independency/blinding is given to score a 'yes'.
(j) Concerning the outcome RTW.
(k) Each event described and correctly attributed to (allocated) treatment; if explicit report of 'no adverse effect' a 'yes' applies. Scores are either a 'yes' or a 'no', a don't know doesn't exist.
(l) Participants who were included in the study but did not complete the observation period or were not included in the analysis must be described. If the percentage of withdrawals and drop-outs does not exceed 20% for short-term follow-up and 30% for long-term follow-up and does not lead to substantial bias, a 'yes' is scored. No drop-outs reported scores as don't know.
(m1) Outcome assessment at the end of the intervention period.
(m2) Outcome assessment $\geq$ 6 months after pre-test.
(n) Timing of outcome assessment identical for all patients or identical for all intervention groups; for all important outcome assessments.
(o) To be presented per group at pre-test and for most important outcome assessments.
(p) All patients are reported/analysed for the most important moments of effect measurement (minus missing values), irrespective of non-compliance and co-interventions.
(q) Both point estimates and measures of variability should be presented (to be scored for each important outcome parameter separately). Point estimates are: means, medians, modes, etc. Measures of variability are; standard deviations, 95% confidence intervals, etc. For dichotomous or categorical data, proportions have to be presented.

Scores RCTs and CCTs

All criteria were scored as yes, no or unclear. Studies were considered to be of high quality if at least six criteria for internal validity, three descriptive criteria and one statistical criterion were scored positively.

Scores OD's

All criteria were scored as yes, no or unclear. Studies were considered to be of sufficient quality if at least four criteria for internal validity, two descriptive criteria and one statistical criterion were scored positively.

Appendix 3: Characteristics of included studies

Reference	Population	Follow-up	Description intervention	Description control intervention	Effect of intervention	Methodological quality
Bisiker and Millinchip [34], UK Retrospective design	I: N: 74 G: 56/18 A: 16–64 In: neurological problems: brain injury (SAH*, diabetic coma, AV* malformation, brain abscess) 8 Head Injury 27 Stroke 23 MS* 5 Guillain Barré syndrome 2 Other 9	Follow up: NIA* N: 3 unable to participate due to health deterioration	Equal Pathways to Work Cn: Maintaining/starting vocational route: work goals, needs in relation to work, basic skills, confidence, insight/self awareness, anger management, social skills, benefit advice, transport, learning strategies Pursuing vocational routes: returning to existing job: Job/workplace evaluations, education employer, liaison with DEA* 'Access to work', improve work-related skills or retraining (suitable training courses, CV* writing, interview skills, social skills, behavioural management) Sustaining employment: Work placements, graded RTW, regular review with client and employer for 6 months after RTW for maximum hours and duties P: senior OT*, project co-ordinator with training background, support workers, clerical support S: community F: NIA D: NIA		Returned to paid work N Brain Injury: 4 of 8 Head Injury: 8 of 27 Stroke 6 of 23 Total population 25 of 64	OD Low
Gamble and Moore [21], USA Prospective cohort study	I: N: 78 C: N: 995 G: 69.9/30.1% A: 35.4, 9.68, 16–71 In: TBI* Severe disability yes/no 88.8/11.2%	90 days	Supported employment services during vocational rehabilitation Cn: Training on the job and supports for as long as the client needed them P: NIA S: NIA F: NIA D: NIA	No supported employment services during vocational rehabilitation P: NIA S: NIA F: NIA D: NIA	Competitive employment N I: 53 of 78 C: 468 of 995 $\chi^2 = 12.67$, $p < 0.003$	OD Low
Geurtsen et al. [22], The Netherlands Prospective cohort study	I: N: 24 G: N/N: NIA, 75/25% A: 35.4, 9.7, 16–71 In: severe ABI* TBI 18 Stroke 3 Tumour 2 Encephalitis 1 Impaired illness awareness, alcohol/drug problems and/or behavioural problems	N: 1 refused to co-operate N: 1 moved and could not be traced T0 Start T1 End of treatment T2 after 1 Y	Brain Integration Programme Cn: 3 modules independent living module social-emotional module work module (neuropsychological assessment, work practice, evaluation working abilities in vocational assessment unit, evaluation of abilities to perform supported/sheltered/volunteer work, advice about leisure activities) P: rehabilitation team members (neuropsychologist, neuropsychiatrist, physiatrist, occupational therapist, cognitive therapist, social worker, speech language therapist, physical therapist, nurses/coaches) S: individual counselling, group therapy and family education, residential setting rehabilitation center F: NIA D: Mean 198.9 days, SD 71.4, range 112–382 Intervention ~ 250 hours (total); work module ~ 44 hours		Working N T0 9 of 24 T1 11 of 24 T2 14 of 24 Work hours per week mean of all participants/ SD T0 8.0/ 14.2 T1 7.4/ 11.2 T2 15.5/ 12.9	OD Sufficient

(*Continued*)

Appendix 3. (Continued).

Reference	Population	Follow-up	Description intervention	Description control intervention	Effect of intervention	Methodological quality
Geurtsen et al. [23], The Netherlands Prospective cohort study	I: N: 70 G: 46/24 A: 25.1, 7.9, 18–49 In: ABI TBI 47 Stroke 7 Tumor 10 Encephalitis 4 Hypoxia 2 Problems social functioning/ emotional control/ work integration	N: 2 refused follow-up assessment N: 1 could not be located T0 Inclusion T1 Start of treatment T2 End of treatment T3 after1 Y	Brain Integration Programme Cn: 3 modules independent living module social-emotional module work module P: rehabilitation team members (neuropsychologist, neuropsychiatrist, physiatrist, occupational therapist, cognitive therapist, social worker, speech language therapist, physical therapist, nurses/coaches) S: individual 90%, small group 10% tertiary rehabilitation centre F: NIA D: Mean 196.2 days, SD 61.9, range 44–357 Intervention ~ 250 hours (total); work module ~ 44 hours	3 month waiting list control period	Work (paid job) N T0 12 of 70 T1 11 of 70 T2 23 of 70 T3 36 of 70 Hours per week mean of working patients/ SD T0 14.3/ 10.8 T1 12.9/ 16.3 T2 18.1/ 11.3 T3 18.8/ 11.2 Significant effect of time on work situation Wald = 23.976, df = 1, $p = 0.0$	OD Sufficient
Man et al. [24], Hong Kong RCT	I: N: 25 C: N: 25 G: NIA A: 18–55 In: mild and moderate TBI	1, 3, 6 M I: N: 5 dropped out C: N: 5 dropped out	Artificial intelligent 3D virtual reality-based vocational training system (AIVTS) Cn: problem-solving/vocational skills training modules: introduction, training, practice and review of these skills (clerical work) P: trainer explains the programme; computer (user exercises direct control over virtual environment, interactive, immediate feedback) S: computer laboratory of department of rehabilitation sciences F: 12 sessions (each 20–25 minutes) D: NIA	Conventional psycho-educational vocational training programme (PEVTS) same as AIVTS in form of training manual and practicing under supervision of vocational trainer	No significant differences between groups regarding job status	RCT Low
Murphy et al. [25], UK Prospective cohort study	I: N: 232 G: N/N: NIA 82/ 12% A: 33, 17–62 In: (very) severe ABI N: NIA TBI 62% Cardiovascular 22% Tumour 4.3% Neurological 4.3% Hypoxia 2.6% Other 0.75%	50 W (mean programme duration) I: N: NIA, 13% withdrew	Rehab UK vocational rehabilitation programme Cn: Element A (A) pre-vocational intensive basic cognitive rehabilitation Element B (B) placements in real work settings while disability payments monitored by job coach (who encourages client to use compensatory strategies, informs employer on ABI and needed workplace adjustments), assessment of ability to work in competitive standard, gradual increase hours and tasks Centre-based sessions to improve job seeking skills, practice talking about ABI and gaps in CV Supported job search Job coaching support Follow-up support P: clinical/occupational psychologist with trans disciplinary team of tutors, job coaches, assistant psychologist, key worker S: A: 3 Rehab UK Centres, in groups 8–12 persons B: work setting and centre-based F: A: sessions spread over 12 weeks, B: every 12 weeks evaluation and update of goals D: A: 12 weeks, B: work placement at least 4 weeks-several months; complete programme 9–12 months; follow-up support up to 5 years		Paid competitive employment N: NIA 41%	OD Sufficient

(*Continued*)

Appendix 3. (Continued).

Reference	Population	Follow-up	Description intervention	Description control intervention	Effect of intervention	Methodological quality
Niemeier et al. [26], USA Prospective cohort study	N: 71 I: N: 39 C: N: 32 G: 49/22 A: 43.3, 12.3 In: ABI auto accident 16 assault 1 fall 3 stroke 13 tumour 1 aneurysm 4 other 29	At completion of VTP and after 6 M N: 1 dropped out	Vocational Transitions Programme (VTP) Cn: 20 sessions each session 5 parts (4 steps and wrap-up time) manualized employability-enhancing intervention, work-related information and skills to improve chances of return to competitive employment, topics: work readiness, overcome obstacles, goal-setting, find a mentor, skills to find a job, strategies for coping, anger management, stress management, how solving problems P: clubhouse staff co-ordinators and directors S: treatment groups 5–8 attendees, at 6 different brain injury clubhouses F: 2 sessions/week D: 10 weeks	Waiting controls receiving VTP after conclusion of the study	Working (working and volunteering, working but not volunteering) I: N: 6 C: N: 4 Chi-square = 0.69; df = 1; $p = 0.4052$	OD Sufficient
Ntsiea et al. [27], South Africa RCT	I: N: 40 C: N: 40 I: G: 21/19 A: 45, 8.5, 29–60 C: G: 20/20 A: 44, 8.9, 26–50 In: stroke, less than 8 weeks after onset stroke, Barthel Index at least 12 (of 20)	3, 6 M I: N: 5 C: N: 3	Workplace intervention programme Cn: week 1: assessment for work: work modules to assess perception, visual discrimination, sequencing ability, numerical ability, reasoning and language ability, motor co-ordination, eye hand coordination, measurement ability, colour discrimination week 2: interview stroke survivor and employer separately: barriers and enablers for RTW meeting therapist, stroke survivor and employer: plan to overcome barriers and strengthen enablers week 3: individual specific working on barriers, work visit, identify what stroke survivor can (not) do, vocational counselling, coaching, emotional support, adaptation working environment, advice on coping, compensate for functional limitations, fatigue management (Therapist Portable Assessment Lab, administration job content questionnaire) Week 4–6 continuation, monitoring progress, making adjustments if necessary at the workplace P: physiotherapist, occupational therapist (and psychologist, speech therapist and/or social worker when necessary S: at stroke survivor's place of work (except for assessment) F: once per week for 1 hour, except for assessment (minimum of 4 hours) D: 6 weeks Usual therapy at hospital continued: general activities to improve impairments and activity limitations and prepare for return home, consideration of job requirements, without work visits and workplace intervention	Cn: usual stroke rehabilitation at the hospital general activities to improve impairments and activity limitations and prepare for return home, consideration of job requirements, without work visits and workplace intervention P: physiotherapist, occupational therapist (and speech therapist and/or social worker when necessary) S: inpatient and outpatient F: NIA D: NIA	RTW at 6 months I: N: 24 of 40 C: N: 8 of 40 $p < 0.001$ OR* = 5.2 SE* = 2.8 95% CI: 1.8–15.0	RCT High

(*Continued*)

Appendix 3. (Continued).

Reference	Population	Follow-up	Description intervention	Description control intervention	Effect of intervention	Methodological quality
Salazar et al. [28], USA RCT	Active duty military members I: N: 67 G: N/N: NIA, M 93% A: 25, 6.6 C: N: 53 G: N/N: NIA, M 96% A: 26, 6.2 In: TBI moderate–severe GCS* mean/SD I: 9.4/3.7 C: 9.5/3.4 PTA* > 7 d N: NIA % I/C 41/42 Period unconsciousness N: NIA, % I/C > 1 h, 53/76 > 24 h 30/38 Cause (in peacetime): N: NIA % I/C motor vehicle accident 49/72 assault 27/9	8 W 6, 12, 24 M I: N: 7 withdrew (medical reasons 2, non-medical 5) C: N: 6 received supplemental therapy	In-hospital interdisciplinary cognitive rehabilitation Cn: milieu oriented approach modified to fit in a military framework Physical fitness training, Group and individual (cognitive, speech, occupational, coping skills therapies) Group therapies (planning, organization, cognitive skills, pragmatic speech, milieu, psychotherapy and community re-entry) Work therapy programme Placement in various work settings as similar to previous military specialty as possible P: conducted by board certified physiatrist, staff: certified neuropsychologist experienced in milieu TBI rehabilitation, certified OT, speech pathologist, 2 rehabilitation assistants (when needed physical therapy, neurological/psychiatric consultations) S: in-hospital, group and individual F: NIA D: NIA	Home rehabilitation Cn: TBI education and individual counselling, recommended strategies for enhancing cognitive and organizational skills, education materials, various home number and card game exercises, encouraged to watch news programmes, read magazines and books, daily physical exercise weekly contact with psychiatric nurse inquiring week's events, offering support and advice in addressing problems (30-minute telephone calls) P: psychiatric nurse, with families when available profession trainer S: home F: daily training, weekly 30-minute telephone calls D: duration	RTW after 1 year N: NIA % I: 90 C: 94 $p = 0.51$ 95% CI: –5–14%	RCT High
Sarajuuri et al. [29] Finland Prospective cohort study	I: N: 19 G: 16/3 A: 30.5, 10.6 C: N: 23 G: 17/3 A: 29.5, 11.0 In: TBI moderate–severe GCS mean/SD I: 7.9/2.7 C: 8.0/2.5 Mechanism N I/C motor vehicle collision 8/7 bicycle collision 3/1 pedestrian-auto collision 1/3 assault 1/1 other 5/8 unknown 1/0 CT*/MRI* I/C Contusion and/or haematoma 15/16 Diffuse axonal injury 8/5 Severe intracranial pressure 7/5 Craniotomy 4/5	2 Y I: N: 0 C: N: 3	Individualized Neuropsychological Sub-group Rehabilitation Programme (INSURE) Cn: post-acute interdisciplinary inpatient rehabilitation neuropsychological rehabilitation and psychotherapy Standardized and individualized (to meet special needs) Group meeting (goals for the day, programme, promote psychological and physiologic arousal, foster personal orientation; discussion on injury related aspects; compensate cognitive symptoms; mastering communication disorders; express emotions and experiences through photography; social and material issues; encourage sport activities) Individual (assess goals for work) After 4 weeks INSURE seminar with participants and significant others, employers (share information) Supported and individually tailored interventions to find productive activities that fit interest and abilities Supported work trials Follow-up support P: neuropsychologist, neurologist, rehabilitation nurse, social worker, speech and language pathologist, OT, physical therapist S: inpatient, in groups 5–8 members and individual F: 8:30 AM–4.00 PM on weekdays Neuropsychological psychotherapy 4 days/week Individual sessions daily Cognitive twice a week D: 6 weeks	Conventional clinical care and rehabilitation, referred by physicians in the local healthcare system Cn: physical, occupational, speech, neuropsychological, psychotherapy Individually tailored Evaluations of rehabilitation needs, multidisciplinary inpatient rehabilitation, outpatient follow-up. P: NIA S: hospital or outpatient F: NIA D: NIA	Gainful work after 2 years Full time I: 1 of 19 C: 7 of 20 Part time I: 3 of 19 C: 1 of 20 χ^2-test = 1.64 $p = 0.20$ Productive (gainful and non-gainful work volunteer work, work trial, study) I: 17 of 19 C: 11 of 20 OR = 6.96 95% CI: 1.26–38.44 χ^2_1-test = 5.72 $p = 0.02$	OD Sufficient

(*Continued*)

Appendix 3. (Continued).

Reference	Population	Follow-up	Description intervention	Description control intervention	Effect of intervention	Methodological quality
Trexler et al. [30], USA RCT	I: N: 12 C: N: 11 I: G: 6/5 A: 43.2, 12.0 C: G: 8/3 A: 42.6, 12.8 In: TBI I: 3, C: 4 Intracranial haemorrhage I: 4, C: 3 Stroke I: 3, C: 3	6 M N: 1 missing data	Resource facilitation (RF) Cn: assisting participants to return to work (needs assessment, person-centred goal-setting, evaluate effectiveness of what was utilized in the past, facilitate access to resources, monitor status and quality of supports, education about brain injury, personal advocacy, partnership development, maintenance of RF Handbook including projected discharge plan) P: resource facilitator, when appropriate former employer actively engaged in RTW plan S: outpatient neurorehabilitation clinic, home, community, workplace, telephonic communication F: every 2 weeks contact facilitator–participant; every week or 2 contact facilitator-author(s); 3 case conferences facilitator-authors-vocational rehabilitation counsellor D: 6 months; mean number of hours of intervention 10.6, median 8.0	No contact, only after 6 months to obtain follow-up measures	Employed N (full-time/part-time) I: N: 7 (4/3) C: N: 4 (3/1) Wald-Wolfkowitz $z = -3.277$, $p < 0.0001$	RCT High
Vanderploeg et al. [31], USA RCT	Active duty military members I: N: 184 G: 165/15# A: 33.2, 13.5 C: N: 182 G: 170/10# A: 31.7, 12.9 In: non-penetrating TBI moderate–severe GCS mean/SD I: 6.8/3.5 C: 6.7/3.7 PTA < 7 d I: 12/177# C: 19/176# PTA > 7 d I: 165/177# C: 157/176# Cause Accident I: 148/165# C: 151/64# Assault I: 17/165# C: 13/164# #missing data	1 Y N: I/C rescinded before treatment 3/2 lost to follow-up 13/16 refused follow-up 1/5 deceased 3/3 unable to be contacted for 1 Y follow-up 9/6 N: I/C included in analysis I: 180 of 184 C: 180 of 182	Cognitive didactic rehabilitation Cn: didactic trial and error learning treatment emphasizes building self-awareness interventions target executive functions (working memory, mental tracking, communication, executive self-awareness) real life tasks not included P: certified experienced therapists (provided occupational, physical, speech/cognitive, neuropsychological therapy in their own professions) S: office setting, individual F: 1.5–2.5 hours/day D: 20–60 days (Monday to Friday), 26–84 calendar days	Functional experiential rehabilitation Cn: experiential interventions errorless learning focus on developing functional abilities or skills interventions target functional behaviours (compensation techniques, environmental management, functional task-specific checklists) self-analytic interventions or focus in self-awareness not included P: therapists S: real life environments (hospital recreation area, simulated home environment), group session F: 1.5–2.5 hours/day D: 20–60 days (Monday to Friday), 26–84 calendar days	RTW (work and or school) I: 65 of 167# C: 58 of 164# #missing data $\chi^2_{1,n=329} = 0.45$, $p = 0.5$	RCT High

I, intervention group; C, control group; N, number; G, gender M/F*; A, age mean, SD*, range; In, injury, Loss to follow-up; Y, years; M, months; W, weeks; Cn, content; P, profession trainer; S, setting; F, frequency; D, duration; Proportion RTW* vs no RTW; Design RCT*, Quality high/low; Design OD*, Quality sufficient/low; M/F, male/female; SD, standard deviation; RTW, return-to-work; RCT, randomized controlled trial; OD, other design; SAH, subarachnoid haemorrhage; AV, arteriovenous; MS, multiple sclerosis; NIA, no information available; DEA, disability employment adviser; CV, curriculum vitae; OT, occupational therapist; TBI, traumatic brain injury; ABI, acquired brain injury; OR, odds ratio; SE, standard error; GCS, Glasgow coma scale; PTA, post-traumatic amnesia; CT, computed tomography; MRI, magnetic resonance imaging.

Appendix 4: Methodological quality of selected studies randomized controlled trials (RCTs) and other designs (ODs) [18,19]

Reference	Internal validity	Descriptive	Statistical	Methodological quality RCT high/low OD sufficient/low
RCT				
Man et al. [24]	g, j, l, n	c, d, m1, m2	o, q	low
Ntsiea et al. [27]	b1, b2, g, i, j, l, n, p	a, c, d, m1, m2	o, q	high
Salazar et al. [28]	b1, b2, g, j, l, n, p	a, c, d, m1, m2	o, q	high
Trexler et al. [30]	b1, f, g, j, l, n	a, c, d, m1, m2	o, q	high
Vanderploeg et al. [31]	b1, b2, g, i, j, l, n, p	a, c, d, m2	o, q	high
OD				
Gamble and Moore [21]	j	k	o, q	low
Geurtsen et al. [22]	g, i, j, l, n, p	a, d, m1, m2	o, q	sufficient
Geurtsen et al. [23]	g, i, j, l, n	a, d, m1, m2	o, q	sufficient
Murphy et al. [25]	g, i, j, l, n	a, d, m1, m2	o	sufficient
Niemeier et al. [26]	g, j, l, n	a, d, m1, m2	o	sufficient
Sarajuuri et al. [29]	i, j, l, n	a, d, m2	o, q	sufficient
Bisiker et al. [34]	j, l, n	a, d	o	low

Specifications and descriptions of the criteria are demonstrated in Appendix 2.
Only the criteria scored positive are reported. Cut-off points regarding quality level are described in the methods section.