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Crowther R, Marshall M, Bond GR, Huxley P

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[Intervention Review]

Vocational rehabilitation for people with severe mental illness

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ABSTRACT

Background

Unemployment rates are high amongst people with severe mental illness, yet surveys show that most want to work. Vocational rehabilitation services exist to help mentally ill people find work. Traditionally, these services have offered a period of preparation (Pre-vocational Training), before trying to place clients in competitive (i.e. open) employment. More recently, some services have begun placing clients in competitive employment immediately whilst providing on-the-job support (Supported Employment). It is unclear which approach is most effective.

Objectives

To assess the effects of Pre-vocational Training and Supported Employment (for people with severe mental illness) against each other and against standard care (in hospital or community). In addition, to assess the effects of: (a) special varieties of Pre-vocational Training (Clubhouse model) and Supported Employment (Individual Placement and Support model); and (b) techniques for enhancing either approach, for example payment or psychological intervention.

Search methods

Searches were undertaken of CINAHL (1982-1998), The Cochrane Library (Issue 2, 1999), EMBASE (1980-1998), MEDLINE (1966-1998) and PsycLIT (1887-1998). Reference lists of eligible studies and reviews were inspected and researchers in the field were approached to identify unpublished studies.

Selection criteria

Randomised controlled trials of approaches to vocational rehabilitation for people with severe mental illness.

Data collection and analysis

Included trials were reliably selected by a team of two raters. Data were extracted separately by two reviewers and cross-checked. Authors of trials were contacted for additional information. Relative risks (RR) and 95% confidence intervals (CI) of homogeneous dichotomous data were calculated. A random effects model was used for heterogeneous dichotomous data. Continuous data were presented in tables (there were insufficient continuous data for formal meta-analysis). A sensitivity analysis was performed, excluding poorer quality trials.

Main results

Eighteen randomised controlled trials of reasonable quality were identified. The main finding was that on the primary outcome (number in competitive employment) Supported Employment was significantly more effective than Pre-vocational Training; for example, at 18 months 34% of people in Supported Employment were employed versus 12% in Pre-vocational Training (RR random effects (unemployment)

0.76 95% CI 0.64 to 0.89, NNT 4.5). Clients in Supported Employment also earned more and worked more hours per month than those in Pre-vocational Training. There was no evidence that Pre-vocational Training was more effective in helping clients to obtain competitive employment than standard community care.

Authors' conclusions

Supported employment is more effective than Pre-vocational Training in helping severely mentally ill people to obtain competitive employment. There is no clear evidence that Pre-vocational Training is effective.

PLAIN LANGUAGE SUMMARY

Vocational rehabilitation for people with severe mental illness

A majority of severely mentally ill people would like to work and there are compelling ethical, social and clinical reasons for helping them to achieve this goal. Pre-vocational Training and Supported Employment are two different approaches to helping severely mentally ill people obtain employment. The key principle of Pre-vocational Training is that a period of preparation is necessary before entering competitive employment. In contrast, the key principle of Supported Employment is that placement in competitive employment should occur as quickly as possible, followed by support and training on the job. This systematic review found that people who received Supported Employment were significantly more likely to be in competitive employment than those who received Pre-vocational Training (at 12 months 34% employed in Supported Employment compared with 12% in Pre-vocational Training).

BACKGROUND

People who suffer from severe mental disorder experience high rates of unemployment. In the United States unemployment rates amongst such people are estimated at 75-85% (Lehman 1995, Ridgeway 1998), whilst in the UK rates of 61-73% have been reported (McCreadie 1992, Meltzer 1995). These high rates reflect the disability caused by severe mental illness, but they also reflect discrimination (unemployment rates are higher than in other disabled groups - ONS 1998) and the low priority given to employment by psychiatric services (Lehman 1998). Despite high unemployment rates amongst the severely mentally ill, surveys have consistently shown that most want to work (Hatfield 1992, Lehman 1995, Shepherd 1994).

There are compelling ethical, social and clinical reasons for helping mentally ill people to work. From an ethical standpoint, the right to work is enshrined in the Universal Declaration of Human Rights 1948 and has been incorporated into national disability acts in Europe and America. From a social standpoint, high unemployment rates are an index of the social exclusion of severely mentally ill people, which many governments, including that of the UK, are committed to reducing (DoH 1998). Finally, from a clinical standpoint, employment may lead to improvements in the outcome of severe mental illness, through increasing self-esteem, alleviating psychiatric symptoms, and reducing dependency and relapse (Lehman 1995).

Helping mentally ill people to work is not a new idea. The value of therapeutic work was recognised by the pioneers of the asylum movement, and in their latter days many large asylums depended on the labour of their inmates in farms, workshops, or work-crews (Jones 1993). As asylums closed down, work experience played an important role in the preparation of patients for discharge. Patients who performed well on graded tasks within the hospital were gradually reintroduced to working in the community, often through special arrangements with local employers. As community care developed, these arrangements evolved into enterprises or workshops providing sheltered employment within a segregated work setting (Gervey 1994). Such sheltered workshops aimed to place clients in competitive employment after a period of pre-vocational training, but follow up studies showed a success rate of only five to ten percent (Bond 1988, Connors 1987).

The Clubhouse movement arose in the 1950s as a reaction to traditional sheltered employment and to the lack of emphasis on work within mental health services (Macias 1995). The Clubhouse movement proposed that better employment outcomes could be achieved by fostering patient autonomy in a non-psychiatric setting (known as a Clubhouse). The Clubhouse is a building run by clients and staff along egalitarian lines, where clients meet for social activity, mutual support and graded work experience. Like traditional pre-vocational training, the Clubhouse approach involves a period of preparation before clients attempt to return to competitive employment. This period of preparation consists of two stages: the work ordered day and Transitional Employment (Beard 1982). The work-ordered day refers to a process whereby clients join work crews (working side-by-side with staff) that take responsibility for managing and maintaining the Clubhouse. Work crews are seen as a means of preparing for Transitional Employment. Transitional Employment refers to the placement of clients in a series of paid but temporary jobs controlled by the Clubhouse, in order to help them develop the skills and confidence required to cope with competitive employment (Bond 1998a). Whilst there are no rigid guidelines for length of time on work crews, clients are discouraged from seeking competitive employment until they have achieved success in Transitional Employment, and are free to return to work crews at any time (Bilby 1992). Cross-fertilisation between the Clubhouse and traditional approaches led to a number of hybrid approaches (or stepwise eclectic approaches), combining for example, transitional employment with pre-employment training (Bond 1998a).

In the mid-1980s a new approach to vocational rehabilitation emerged, known as Supported Employment. Supported Employment involved trying to place clients in competitive jobs without any extended preparation (Bond 1992). Originally developed for people with learning disabilities, Supported Employment has been defined as paid work that takes place in normal work settings with provision for ongoing support services (Becker 1994, Bond 1998a). Proponents of Supported Employment had two objections to Pre-vocational Training (Bilby 1992, Bond 1997a). First, they argued that it promoted dependency and deterred clients from finding competitive employment. Second, they argued that Pre-vocational Training was not effective in developing work skills. Instead of Pre-vocational Training, they proposed trying to place clients as quickly as possible in competitive employment positions, where they would receive intensive on-the-job support and training from personnel known as Job Coaches (Anthony 1987).

Individual Placement and Support is a carefully specified variant of Supported Employment distinguished by six key principles: (1) the goal is competitive employment in work settings integrated into a community's economy; (2) clients are expected to obtain jobs directly, rather than following lengthy pre-employment training (rapid job search); (3) rehabilitation is an integral component of mental health treatment rather than a separate service; (4) services are based on clients' preferences and choices; (5) assessment is continuous and based on real work experiences; and (6) follow-on support is continued indefinitely (Bond 1998b). Adherence to Individual Placement and Support guidelines may be measured using a fidelity scale (Bond 1997b).

Natural experiments have suggested that Supported Employment is an acceptable intervention that helps sustain people in work. For example, Drake-New Hampshire2 studied a Community Mental Health Centre that was forced to eliminate its day care program because of budget cuts. As a replacement for the day care services, a small Supported Employment program was started. Drake-New Hampshire2 compared the day centre conversion site to a second site, which continued to offer day care alongside traditional Pre-vocational services. Clients at the Supported Employment site showed increased rates of competitive employment, whilst no change was found for the site not converting. After the completion of the initial conversion, the second site subsequently converted to Supported Employment, with similarly favourable results (Clark 1996). Favourable results have been reported from a third day care centre, which made a partial transition to the Individual Placement and Support model of Supported Employment (Bailey-New Hampshire).

Both Pre-vocational Training (traditional, Clubhouse) and Supported Employment are widely practiced. In the US there are 3,000 'psychiatric rehabilitation providers' offering traditional

pre-vocational training and about 230 Clubhouses. There are also around 36,000 mentally ill people in Supported Employment schemes (Bond 1998a, Wehman 1997). In the UK there are around 135 organisations offering Pre-vocational Training and 77 offering Supported Employment (ERMIS 1998). It remains unclear if Pre-vocational Training and Supported Employment are equally effective.

OBJECTIVES

The main objective was to determine how far Pre-vocational Training and Supported Employment were effective in helping people with severe mental illness to obtain competitive (i.e. open) employment. The review also examined how far Pre-vocational Training and Supported Employment affected other work and clinical outcomes. The main comparisons in the review were as follows:

1. Pre-vocational Training versus standard hospital care;
2. Pre-vocational Training (in addition to standard community care) versus standard community care;
3. Supported Employment (in addition to standard community care) versus standard community care;
4. Pre-vocational Training versus Supported Employment.

In addition, the review examined the effectiveness of modifications designed to enhance approaches to vocational rehabilitation (e.g. payment or psychological intervention) and the effectiveness of well-characterised sub-types of Pre-vocational Training (Clubhouse model) and Supported Employment (Individual Placement and Support model). The review did not consider the effectiveness of Assertive Community Treatment or other forms of case management in improving employment outcomes, as these general approaches to enhancing community care have been reviewed elsewhere (Marshall 1999a, Marshall 1999b).

METHODS

Criteria for considering studies for this review

Types of studies

Relevant randomised controlled trials that provided data which could be analysed on an intention-to-treat basis.

Types of participants

Vocational rehabilitation approaches were not designed for a specific diagnostic group nor are they applied in a diagnostic-specific way in everyday practice. Therefore, for the purpose of this review, the main requirements of participants were that they were similar to those who typically present to vocational rehabilitation services. Specific inclusion criteria were that a majority of clients in the trial were: (a) aged 18-65; and (b) suffering from severe mental disorder defined as: schizophrenia and schizophrenia-like disorders; bipolar disorder; or depression with psychotic features. Substance abuse was not considered a severe mental disorder, but trials were eligible if participants had a problem with substance abuse in addition to a mental disorder. Trials were excluded where a majority of participants were suffering from a learning disability.

Types of interventions

Four interventions were defined: Pre-vocational Training, Supported Employment, enhanced approaches, and standard care.

1. Pre-vocational Training
Pre-vocational Training was defined as any approach to vocational rehabilitation in which participants were expected to undergo a period of preparation, before being encouraged to seek competitive employment. This preparation could involve either work in a sheltered environment (such as a workshop or work unit), or some form of pre-employment training or transitional employment. Both the traditional (sheltered workshop) and Clubhouse approaches were classified as Pre-vocational Training.

2. Supported Employment
Supported employment was defined as any approach to vocational rehabilitation that attempted to place clients immediately in competitive employment. It was acceptable for Supported Employment to begin with a short period of preparation, but this had to be of less than one month duration and not involve work placement in a sheltered setting, or training, or transitional employment. Individual Placement and Support was defined as Supported Employment that adhered to the six principles outlined in the Background (see above).

3. Modifications of vocational rehabilitation programs
Modified programs were defined as either Pre-vocational Training or Supported Employment that had been enhanced by some technique to increase participants' motivation. Typically such techniques consisted of payment for participation in the program, or some form of psychological intervention.

4. Standard care was defined as usual psychiatric care for patients in the trial, without any specific vocational component. In all trials where an intervention is compared against standard care, unless otherwise stated clients will have received the intervention in addition to standard care. Thus, for example, in a trial comparing Pre-vocational Training against standard community care, patients in the Pre-vocational Training group will also be in receipt of standard community services, such as out-patient appointments.

Types of outcome measures

The primary outcome was number of clients in competitive employment at various time points (defined as a full or part time position held by the client in an ordinary work setting, for which they were receiving payment at the market rate).

Secondary outcome measures were grouped into three main categories.

1. Other employment outcomes:
1.1 in any form of employment (defined as competitive employment, transitional employment, sheltered employment or voluntary work);
1.2 in any form of employment or education (defined as above but including people on training courses or full or part-time education);
1.3 mean hours per month in competitive employment;
1.4 mean monthly earnings.

2. Clinical outcomes:
2.1 numbers lost to follow up (for trials with community or hospital controls only) or numbers not participating in program (for trials comparing different VR approaches);
2.2 admitted to hospital (for trials with a community control) or number living in community at end of study (if a hospital control);
2.3 other clinical outcomes (e.g. symptoms, quality of life and social functioning).

3. Costs:
3.1 mean monthly program costs (direct costs of experimental program versus direct costs of control program);
3.2 mean monthly healthcare costs (including costs of all psychiatric/medical care and program costs, but excluding earnings or transfer costs i.e. benefits obtained).

Search methods for identification of studies

1. Electronic searching
The search began by deriving a list of search terms from reading overviews of the field and consulting experts in vocational rehabilitation.

1.1 CINAHL (January 1982-December 1998) was searched using the Cochrane Schizophrenia Group's search strategy for randomised controlled trials combined with the phrase:

[(SUPP* EMPLOY*) or (EMPLOYMENT) or (PSYCHOSOCIAL REHAB*) or (PSYCHIATRIC REHAB*) or (OCCUPATIONAL REHAB*) or (SOC* REHAB*) or (WORK REHAB*) or (JOB REHAB*) or (SHELTERED WORK*) or (TRANSITIONAL EMP*) or (REHABILITATION COUNSELLING) or (VOCATION*) or (FOUNTAIN HOUSE*) or (FOUNTAIN-HOUSE*) or (CLUBHOUSE*) or (CLUB-HOUSE*). The results of this search were then combined with a search using the major indexing term MENTAL-DISORDERS.

1.2 The Cochrane Library (Issue 2, 1999) was searched using the phrases:

[(SUPP* EMPLOY*) or (EMPLOYMENT) or (PSYCHOSOCIAL REHAB*) or (PSYCHIATRIC REHAB*) or (OCCUPATIONAL REHAB*) or (SOC* REHAB*) or (WORK REHAB*) or (JOB REHAB*) or (SHELTERED WORK*) or (TRANSITIONAL EMP*) or (REHABILITATION COUNSELLING) or (VOCATION*) or (FOUNTAIN HOUSE*) or (FOUNTAIN-HOUSE*) or (CLUBHOUSE*) or (CLUB-HOUSE*) and (MENTAL ILLNESS or SCHIZOPHRENIA)]

1.3 EMBASE (January 1980-December 1998) was searched using the Cochrane Schizophrenia Group's search strategy for randomised controlled trials combined with the phrase:

[(SUPP* EMPLOY*) or (EMPLOYMENT) or (PSYCHOSOCIAL REHAB*) or (PSYCHIATRIC REHAB*) or (OCCUPATIONAL REHAB*) or (SOC* REHAB*) or (WORK REHAB*) or (JOB REHAB*) or (SHELTERED WORK*) or (TRANSITIONAL EMP*) or (REHABILITATION COUNSELLING) or (VOCATION*) or (FOUNTAIN HOUSE*) or (FOUNTAIN-HOUSE*) or (CLUBHOUSE*) or (CLUB-HOUSE*). The results of this search were then combined with a search exploding all sub-headings of the indexing term MENTAL DISEASE.

1.4 MEDLINE (January 1966-December 1998) was searched using the Cochrane Schizophrenia Group's search strategy for randomised controlled trials combined with the phrase:

[(SUPP* EMPLOY*) or (EMPLOYMENT) or (PSYCHOSOCIAL REHAB*) or (PSYCHIATRIC REHAB*) or (OCCUPATIONAL REHAB*) or (SOC* REHAB*) or (WORK REHAB*) or (JOB REHAB*) or (SHELTERED WORK*) or (TRANSITIONAL EMP*) or (REHABILITATION COUNSELLING) or (VOCATION*) or (FOUNTAIN HOUSE*) or (FOUNTAIN-HOUSE*) or (CLUBHOUSE*) or (CLUB-HOUSE*). The results of this search were then combined with a search exploding all sub-headings of the indexing term MENTAL DISORDERS.

1.5 PsycLIT (January 1887-December 1998) was searched using the Cochrane Schizophrenia Group's search strategy for randomised controlled trials combined with the phrase:

[(SUPP* EMPLOY*) or (EMPLOYMENT) or (PSYCHOSOCIAL REHAB*) or (PSYCHIATRIC REHAB*) or (OCCUPATIONAL REHAB*) or (SOC* REHAB*) or (WORK REHAB*) or (JOB REHAB*) or (SHELTERED WORK*) or (TRANSITIONAL EMP*) or (REHABILITATION COUNSELLING) or (VOCATION*) or (FOUNTAIN HOUSE*) or (FOUNTAIN-HOUSE*) or (CLUBHOUSE*) or (CLUB-HOUSE*).

This search strategy identified 40 confirmed trials and 13 review articles.

2. Reference searching
The sensitivity of the search strategy was examined by comparing the results of the search with the reference lists of the identified reviews and trials to determine how many cited trials had not been detected. Of three undetected trials cited in the reviews, two were not listed on any of the databases, whilst the third trial was indexed under the term 'DELIVERY OF HEALTH CARE/INTEGRATED'. This term was then added to the search strategy and the search was re-run, but no further trials were detected. Finally the results of the search were compared against bibliographies from two unpublished PhD theses (Kim 1998, Schneider 1998) but no further trials were detected.

3. Personal contact
Researchers in the field were approached to identify unpublished studies.

Data collection and analysis

1. Selection of studies
The initial electronic search was performed by one reviewer (RC). The list of publications identified by the search strategy was examined by two reviewers working independently (MM, RC). Each reviewer discarded irrelevant publications and retained only those trials in which some form of vocational rehabilitation had been compared against a control treatment. The reviewers then obtained copies of all papers relating to relevant trials. Once these papers had been obtained they were read independently by the two reviewers who decided whether the trials were eligible for the study and allocated them to one of six possible comparisons (Pre-vocational Training versus hospital control; Pre-vocational Training versus community control; Supported Employment versus Pre-vocational Training; Supported Employment versus community control; modifications of vocational rehabilitation programs). Inter-rater agreement was assessed for overall eligibility and for allocation of trials to comparisons.

2. Quality assessment
MM and RC rated each trial according to the three categories of allocation concealment described in the Cochrane Collaboration Handbook (Clarke 1999): A - adequate (i.e. the method for assigning participants to interventions was robust against patient and clinician bias and clearly described); B - method of allocation concealment unclear; C - inadequate (i.e. the method of assignment was not robust to patient and clinician bias). When the method of allocation concealment was unclear, trialists were contacted for further details. Blinding of patients and treating clinicians is not possible in trials of vocational rehabilitation. It is also difficult for those evaluating outcome to remain blind to group allocation,

as they are obliged to collect data that indicate group allocation (such as days in different types of employment). However, trials were rated on independence of evaluators from those providing the intervention.

3. Data extraction
All data were extracted by the two reviewers working alone and then cross-checked to ensure reliability.

4. Data management
4.1 Missing data
4.1.1 Unacceptable loss to follow-up: a sensitivity analysis was performed excluding trials where the loss to follow up was greater than 80%. Additionally, amongst included studies, the review did not report data on outcomes where less than 50% of those assessed at baseline failed to be reassessed on the same outcome at follow-up.

4.1.2 Intention-to-treat analysis: it was assumed that patients who were lost to follow up remained unemployed, as suggested by previous research (Bond 1984).

4.2 Dichotomous (i.e. yes/no data)
The relative risk and 95% confidence interval (CI), as well as the number needed to treat (NNT) were calculated for relevant outcomes. The relative risk was chosen over the odds ratio because the latter tends to overestimate effect size when event rates are high (Clarke 1999). The NNT was calculated as the inverse of the absolute risk reduction, and confidence intervals were calculated using the Arcus Quickstat(c) Program.

4.3 Continuous data
Continuous data were reported on MetaView when normally distributed, and when available on the same variable from more than one trial. Otherwise continuous data, including skewed data (see below 4.3.2) and data analysed using non-parametric methods, were reported in tables or in the text.

4.3.1 Intention-to-treat analysis: in the case of continuous data a completer analysis was presented.

4.3.2 Rating scales: data from rating scales were excluded if collected using an unpublished scale, or based on a subset of items from a scale (see Marshall 2000 for justification).

4.3.2 Skewed data: continuous data on mental health outcomes are often not normally distributed (i.e. skewed). It may not be appropriate to analyse such data using parametric methods, such as those used by MetaView. In this review the degree of skew of continuous data was assessed by multiplying the standard deviation by 1.96. If the result was less than the mean then the data were entered on MetaView, otherwise they were reported in the text or in tables (Altman 1996). Data analysed using non-parametric statistics were also reported in tables.

4.3.3 Conversion of data: data were reported as presented in the original studies, with two exceptions. First, continuous variables such as costs or days in employment were converted to a single common scale (such as mean days in employment per month or mean monthly costs) in order to facilitate comparisons. Second, number of clients not participating in the program was estimated by taking the number of clients who were not re-interviewed at the final follow-up assessment, or by taking actual non-participation rates (where these were given in the trial report and were greater than the number not re-interviewed). Clients were not counted as not participating if the reason for non-participation was that they were in an alternative work or educational placement.

5. Sub-analyses
Two sub-types of Pre-vocational Training and Supported Employment (the Clubhouse and IPS models, respectively) have been sufficiently specified to be regarded as approaches in their own right (see above for details). Data from trials using these approaches were included in the main Pre-vocational Training and Supported Employment comparisons, but were also presented separately as sub-analyses.

6. Heterogeneity
Heterogeneity between trial results was assessed by inspection of graphical presentations and by calculating a Chi squared test of heterogeneity. If heterogeneity was present (p value of Chi squared <0.1) the data were re-analysed using a random effects model. If heterogeneity was still present, the summary relative risk was interpreted cautiously, and efforts were made to identify the source of the heterogeneity.

7. Addressing publication bias
Data from all identified and selected trials were entered into a funnel graph (trial effect versus trial size) in an attempt to investigate overt publication bias.

8. Tables and figures
The data were recorded on RevMan so that the area to the left of the 'line of no effect' indicated a 'favourable' outcome for the first intervention mentioned in the title of the comparison. For example, in trials comparing Supported employment to Pre-vocational Training, an outcome to the left of the 'line of no effect' would indicate a favourable outcome for Supported Employment, whereas an outcome to the right would indicate a favourable outcome for Pre-vocational Training .

RESULTS

Description of studies

1. Excluded studies
Thirty-one studies were excluded (please see 'Table of excluded studies'); seventeen of these were not randomised, but fourteen were classified as randomised controlled trials. The non-randomised studies consisted of: one survey (without comparison group); three cross-sectional comparisons; five uncontrolled 'before and after' comparisons, and eight quasi-experimental designs (i.e. comparative trials where no attempt was made to randomise). The excluded randomised controlled trials consisted of: five trials of Pre-vocational Training versus standard care (in two the number of participants with mental illness was unclear, and in three the data could not be analysed on an intention-to-treat basis); four trials of modifications of Pre-vocational Training versus Pre-vocational Training (in three the number of participants was unclear, whilst the remaining trial was concerned with increasing productivity rather than helping patients find work); and five trials of approaches to community care that did not involve any specific vocational interventions (three of assertive community treatment and two others), although the trials happened to report employment rates. Of the trials where data could not be analysed on an intention-to-treat basis: in Briggs-Minnesota the number of participants was unclear; in Kaufman-Pittsburgh the numbers

randomised to treatment and control groups were not given; and in Ryan-Connecticut there was substantial exclusion of treatment group participants post-randomisation (for example, any client who failed to complete three months in the Pre-vocational Training group was excluded).

2. Ongoing studies
Two ongoing studies were identified, including one substantial multi-centre study of Supported Employment versus Pre-vocational Training (Carey-US 8 site).

3. Awaiting assessment
There were four studies awaiting assessment: three were published in books that were difficult to obtain (one of which was in Dutch) and one was unpublished.

4. Included studies
Eighteen trials met inclusion criteria for the review (see 'Table of included studies' for full details).

4.1 Participants
People with schizophrenia are well represented in the trials of Pre-vocational Training versus Supported Employment (weighted means of 52.4 and 78.7%). Women were well represented. There were insufficient data to assess representation of people from ethnic minorities. Women, people from ethnic minorities, and people with schizophrenia were well represented in the trials of Supported Employment versus Pre-vocational Training (weighted means of 49.8%, 37.9% and 60.2% respectively).

4.2 Interventions
4.2.1 Pre-vocational training: Becker-Fort Worth compared care on a specialised rehabilitation ward with an integral vocational program against continuing in-patient rehabilitation. Kuldau-California compared a rehabilitation program involving sheltered work, an in-patient therapeutic community and transitional housing against a control involving standard hospital care with rapid discharge planning. Walker-Massachusetts compared day placement in an out-of-hospital industrial therapy unit with standard hospital care. Beard-NewYork compared the 'Clubhouse' model of vocational rehabilitation to standard community care. Dincin-Chicago compared the 'Thresholds' program, involving work crews and transitional employment to standard community care, including six hours of supportive psychotherapy and fortnightly consultations with a psychiatrist. Griffiths-London compared a rehabilitation programme involving day hospital and industrial workshops against standard community care involving home support and day centres. Okpaku-Nashville compared employment-oriented case management involving work assessment and employment preparation against standard case management. Wolkon-Cleveland compared individual counselling and transitional work to standard community care.

4.2.2 Modifications of pre-vocational training: Bell-Connecticut modified pre-vocational training and examined the effect of payment on uptake of sheltered set-aside jobs in a hospital. Blankertz-Philadelph and Kline-Philadelphia examined the effects of psychological interventions (designed to increase motivation) on the uptake of community vocational rehabilitation services. Control groups received vocational rehabilitation services but no psychological intervention. Bond-Chicago1 compared a graded approach (of experience in work crews leading to transitional employment), with an accelerated approach involving immediate placement in transitional employment.

4.2.3 Supported employment: Chandler-LongBeach compared Assertive Community Treatment combined with Supported Employment against standard community care (not involving Assertive Community Treatment). In the studies of Supported Employment versus Pre-vocational Training, Bond-Indiana compared Supported Employment with Pre-vocational work-readiness training. Drake-New Hampshire1 compared the Individual Placement and Support model of Supported Employment with a brokered model of Pre-vocational Training. Drake-Washington compared the Individual Placement and Support Model with Pre-vocational counselling and work adjustment training in a sheltered workshop. Gervey-New York compared Supported Employment with employment training in a sheltered workshop. McFarlane-New York compared Family-aided Assertive Community Treatment plus Supported Employment with conventional Pre-vocational Training from the local vocational rehabilitation service.

4.3 Outcome Scales
Rating scales used to measure clinical outcomes are listed below.

4.3.1 Global Outcome
GAS (Endicott 1976). A clinician rated scale of overall functioning on a scale of 1-100. Lower scores indicate poorer functioning.

4.3.2 Mental State
The Positive and Negative Symptom Scale - PANSS (Kay 1987)
This schizophrenia scale has 30 items, each of which can be defined on a seven-point scoring system varying from one - absent to seven - extreme. This scale can be divided into three sub-scales for measuring the severity of general psychopathology, positive symptoms (PANSS-P), and negative symptoms (PANSS-N). A low score indicates lesser severity.

The Brief Psychiatric Rating Scale - BPRS (Lukoff 1986)
This is used to assess the severity of abnormal mental state. The original scale has 16 items, but a revised 18-item scale is commonly used. Each item is defined on a seven-point scale varying from 'not present' to 'extremely severe', scoring from 0-6 or 1-7. Scores can range from 0-126, with high scores indicating more severe symptoms.

4.3.2 Others
Self-confidence scale (Wing 1966)
No details were available on this scale, and the original reference was difficult to obtain.

Self-esteem (Rosenberg 1969)
This scale is a 10-item self-report measure. Each item involves a statement about how the respondent feels about him or herself ('I feel that I have a number of good qualities') or aspects of his or her functioning ('I feel that I can't do anything right'). Respondents rate each item on a Likert scale from 'almost always true' to 'never true'. Lower scores indicate higher self-esteem.

Quality of Life Scale (Lehman 1983)
This standardised assessment includes areas such as living situation, leisure activities, relationships and finances. Rated on a seven-point scale, with higher scores indicating a better quality of life.

Risk of bias in included studies

1. Randomisation
The quality of allocation concealment in included trials was as follows: seven trials were in randomisation category A (adequate) (Bond-Chicago1, Bond-Indiana, Dincin-Chicago, Drake-New Hampshire1, Drake-Washington, Kuldau-California, Walker-Massachusetts); nine were in category B (unclear) (Becker-Fort Worth, Bell-Connecticut, Blankertz-Philadelph, Chandler-LongBeach, Griffiths-London, Kline-Philadelphia, McFarlane-New York, Okpaku-Nashville, Wolkon-Cleveland); and two were category C (inadequate) (Beard-NewYork, Gervey-New York). Of the trials in category C: in Beard-NewYork allocation was by day of referral and in Gervey-New York allocation was by drawing lots from a hat.

2. Objectivity of rating of outcome
In eight trials outcome was assessed by raters who were not involved in providing the treatment or control interventions (Bell-Connecticut, Chandler-LongBeach, Drake-New Hampshire1, Drake-Washington, Gervey-New York, McFarlane-New York, Okpaku-Nashville, Wolkon-Cleveland). In ten trials it was either unclear how far raters were independent (Becker-Fort Worth, Griffiths-London, Kline-Philadelphia, Kuldau-California), or it was clear that they were not independent (Beard-NewYork, Blankertz-Philadelph, Bond-Chicago1, Bond-Indiana, Dincin-Chicago, Walker-Massachusetts).

3. Description of loss to follow up
Follow up rates were generally good: 16 trials had loss to follow up rates of 20% or less (Beard-NewYork, Becker-Fort Worth, Bell-Connecticut, Blankertz-Philadelph, Bond-Chicago1, Bond-Indiana, Drake-New Hampshire1, Drake-Washington, Gervey-New York, Griffiths-London, Kline-Philadelphia, Kuldau-California, McFarlane-New York, Okpaku-Nashville, Walker-Massachusetts, Wolkon-Cleveland). Loss to follow up rates of greater than 20% were found in the following trials: Chandler-LongBeach (21% at one year); Dincin-Chicago (37% at nine months);

4. Confounding of interventions
There was confounding of the intervention in two trials. In Chandler-LongBeach experimental patients received Assertive Community Treatment in addition to Supported Employment, whilst in McFarlane-New York experimental patients received Family-aided Assertive Community Treatment in addition to Supported Employment.

5. Sensitivity analysis
In the initial analyses data from all included trials, regardless of quality, were analysed within the relevant comparisons. Subsequently, these analyses were repeated excluding data from trials with: (a) allocation concealment in categories B or C; (b) non-independent evaluators; (c) follow up rates of less than 80%; (d) confounding of interventions. As it turned out, only two trials, both of Supported Employment versus Pre-vocational Training (Drake-New Hampshire1, Drake-Washington), met criteria for inclusion in the sensitivity analysis.

Effects of interventions

1. Reliability of data extraction and funnel plot
There were no disagreements between the raters on which trials should be discarded on the basis of abstracts obtained from the electronic search. Inter-rater reliability for inclusion of trials in the review, once full text had been obtained, based on a sample of 20 trials, was 0.89. There was full agreement between raters on categorisation of included trials. There were insufficient data to draw funnel plots in most comparisons, however it was possible to draw a funnel plot for the variable 'not in competitive employment at 12 months' in the comparison: 'Supported Employment versus Pre-vocational Training'. This plot showed evidence of asymmetry attributable to Gervey-New York, which found a large effect size in favour of Supported Employment. It was not clear whether the asymmetry in the funnel plot indicated publication bias or whether it was due to inadequate allocation concealment in this trial. Gervey-New York was not eligible for the sensitivity analysis.

2. PRE-VOCATIONAL TRAINING versus STANDARD HOSPITAL CARE
Three trials, with a total of 200 patients, contributed data to this comparison (Becker-Fort Worth, Kuldau-California, Walker-Massachusetts).

2.1 Not in competitive employment
Few data were available on the primary outcome. One small trial (Becker-Fort Worth) reported data at eight month follow up which showed a non-significant trend in favour of clients in Pre-vocational Training (n=50, RR 0.79 CI 0.63 to 1.00).

2.2 Secondary employment outcomes
Becker-Fort Worth reported that at eight months, a significantly larger number of clients in Pre-vocational Training had obtained any form of employment (n=50, RR 0.42 CI 0.26 to 0.68, NNT 1.8). Walker-Massachusetts, however, reported no difference in hours/month in competitive employment (n=28, Pre-vocational Training mean 36.8, control 31.6, p=0.92, Mann Whitney). Kuldau-California reported that Pre-vocational Training clients earned significantly more dollars per month than controls (Pre-vocational Training mean $176.2, control mean $97.3, p <.01). There was a non-significant trend towards better participation amongst Pre-vocational Training clients (n=78, RR 0.5 CI 0.05 to 5.25).

2.3 Clinical outcomes
The limited data available suggested that clients in Pre-vocational Training were not more likely to be discharged from hospital (n=50, RR 0.95 CI 0.76 to 1.19).

2.4 Sensitivity analysis
No trials met criteria for inclusion in the sensitivity analysis (see Methodological Quality of Included Studies, section 5 above).

3. PRE-VOCATIONAL TRAINING (ALL APPROACHES) versus COMMUNITY CARE
Five trials involving a total of 1204 patients contributed data to this comparison (Beard-NewYork, Dincin-Chicago, Griffiths-London, Okpaku-Nashville, Wolkon-Cleveland).

3.1 Not in competitive employment
Some limited data (Griffiths-London and Beard-NewYork) were available on the primary outcome at 18 and 24 months. These showed no difference between Pre-vocational Training and control (18 months n=28, RR 1.18 CI 0.87 to 1.61; 24 months n=215, RR 0.95 CI 0.77 to 1.17).

3.2 Secondary employment outcomes
Three trials reported data on number in any form of employment. These data showed no difference between Pre-vocational Training and control at three, six, nine, 12 and 18 months.

3.3 Clinical outcomes
Data from two trials (Dincin-Chicago, Okpaku-Nashville) showed no significant difference in the number of clients participating in the program (n=284, RR random effects 0.95 CI 0.52 to 1.7) between Pre-vocational Training and control groups. Data from three trials (Beard-NewYork, Dincin-Chicago, and Wolkon-Cleveland) showed that significantly fewer patients were admitted to hospital amongst those receiving Pre-vocational Training (N= 887, RR 0.79 CI 0.65 to 0.95). However, heterogeneity was present on this outcome and re-analysis using a random effects model failed to show a significant difference (RR random effects 0.71 CI 0.48 to 1.04). Griffiths-London reported no difference in self-esteem (Self-confidence scale, Wing 1966) between Pre-vocational Training and control groups (n=28, Pre-vocational Training mean 25.5, SD 6.6, control mean 23.3, SD 7.3).

3.4 Costs
One trial (Dincin-Chicago) reported mean monthly total healthcare costs of $417.90 for Pre-vocational Training and $651.50 for controls, but no statistical analysis was reported.

3.5 Sensitivity Analysis
No trials met criteria for inclusion in the sensitivity analysis (see Methodological Quality section 5 above).

4. SUB-ANALYSIS 1: CLUBHOUSE APPROACH (TYPE OF PRE-VOCATIONAL TRAINING) versus STANDARD COMMUNITY CARE
Only one trial (Beard-NewYork) provided data for this sub-analysis.

4.1 Not in competitive employment
On the primary outcome at 24 months there was no difference between people allocated to Clubhouse approach in addition to standard care and those in the control group (n=215, RR 0.95 CI 0.77 to 1.17).

4.2 Secondary employment outcomes
Beard-NewYork showed no significant difference between the Clubhouse approach and control in numbers obtaining any form of employment at three, six and 12 months.

4.3 Clinical outcomes
Beard-NewYork found significantly fewer admissions to hospital for patients amongst clients in the Clubhouse group (N=215, RR 0.69 CI 0.46 to 0.96, NNT 6.1).

5. MODIFICATION 1. PRE-VOCATIONAL TRAINING + PAYMENT versus PRE-VOCATIONAL TRAINING ALONE
One trial (Bell-Connecticut) provided data for this comparison.

5.1 Not in competitive employment
No data were available on the primary outcome.

5.2 Secondary employment outcomes
At six month follow-up significantly more clients in the payment group were in any form of employment (n=150, RR 0.40 CI 0.28 to 0.57, NNT 2.2). Clients in the payment group earned significantly more per month (payment group mean $192, non-payment group mean $32.03, t=7.56, p<0.0001).

5.3 Clinical outcomes
Significantly more clients from the payment group participated in the programme (n=150, RR 0.53 CI 0.39 to 0.71, NNT 2.8). There were also significantly fewer admissions to hospital in the payment group (RR 0.55 CI 0.31 to 0.96, NNT 6.4) and they showed significantly better total symptom scores (PANSS, Kay 1987) (payment mean 66.2, SD 15.1, non-payment mean 72.6, SD 15.0. p<0.02).

6. MODIFICATION 2. PRE-VOCATIONAL TRAINING + PSYCHOLOGICAL INTERVENTIONS versus PRE-VOCATIONAL TRAINING ALONE
Two trials (Kline-Philadelphia, Blankertz-Philadelph) provided data for this comparison.

6.1 Not in competitive employment
On the primary outcome at six to nine month follow up there was a difference in favour of Pre-vocational Training and psychological intervention (n=142, RR 0.86 CI 0.78 to 0.95, NNT 7.1). However, there was evidence of heterogeneity on this variable (Chi squared test 3.12, p=0.077): both trials found an effect in favour of the intervention, but the effect size was larger in the smaller trial (Kline-Philadelphia n=20, RR 0.56 CI 0.29 to 1.07; Blankertz-Philadelph n=122, RR 0.90 CI 0.83 to 0.98). Reanalysis using a random effects model found no significant difference (RR 0.76 CI 0.44 to 1.33).

6.2 Secondary employment outcomes
One trial (Blankertz-Philadelph) found that clients receiving psychological intervention were significantly more likely to be in some form of employment (n=122, RR 0.89 CI 0.81 to 0.97, NNT 8.7) or in some form of employment, training or education at the end of the study (n=122, RR 0.63 CI 0.52 to 0.77, NNT 2.8).

6.3 Clinical outcomes
Both trials reported data on numbers not participating in the programme, but found no significant difference between intervention and control groups (n=142, RR 0.85 CI 0.33 to 2.18).

6.4 Sensitivity Analysis
Neither trial met criteria for inclusion in the sensitivity analysis (see Methodological Quality section 5 above).

7. MODIFICATION 3. ACCELERATED ENTRY TO TRANSITIONAL EMPLOYMENT (A TYPE OF PRE-VOCATIONAL TRAINING) versus GRADUAL ENTRY TO TRANSITIONAL EMPLOYMENT
One trial (Bond-Chicago1) provided data for this comparison.

7.1 Not in competitive employment
On the primary outcome there was no difference between groups at nine and 15 months (although there was a result in favour of accelerated placement, that fell just sort of significance at 15 months, n=131, RR 0.88 CI 0.78 to 1.0).

7.2 Secondary employment outcomes
Clients in the accelerated condition were not more likely to be in any form of employment at 15 months (n=131, RR 0.96 CI 0.69 to 1.33), but earned more per month (accelerated condition mean $115.3, control mean $38.9, no statistical analysis).

7.3 Clinical outcomes
There was no difference in participation rates between the two groups at nine or 15 months.

8. SUPPORTED EMPLOYMENT versus STANDARD COMMUNITY CARE
One trial, involving 256 patients, contributed data to this comparison (Chandler-LongBeach).

8.1 Not in competitive employment
On the primary outcome there was no difference between Supported Employment and control at 12 months (n=256, RR 1.01

CI 0.93 to 1.09), but there was a significant difference favouring Supported Employment at 24 months (n=256, RR 0.92 CI 0.85 to 0.99, NNT 12.6) and 36 months (n=256, RR 0.88 CI 0.82 to 0.96, NNT 9).

8.2 Secondary employment outcomes
Supported Employment clients were significantly more likely to be in any form of employment at 12 months (n=256, RR 0.79 CI 0.70 to 0.90, NNT 5.5) and also earned significantly more per month (Supported Employment mean $60.5, control mean $26.9, p<0.05).

8.3 Clinical outcomes
There was no significant difference in participation rates between Supported Employment and control, although there was a result favouring Supported Employment (n=256, RR 0.74, CI 0.55 to 1.01). There was no difference in the number of hospital admissions between Supported Employment and control (n=256, RR 0.83 CI 0.63 to 1.10).

8.4 Costs
Mean monthly healthcare costs were significantly higher for clients in Supported Employment (Supported Employment mean $1599, control mean $527.30), but this finding was difficult to interpret as Supported Employment clients were also receiving Assertive Community Treatment.

9. SUPPORTED EMPLOYMENT (ALL APPROACHES) versus PRE-VOCATIONAL TRAINING
Five trials, involving 484 patients, contributed data to this comparison (Drake-New Hampshire1, Drake-Washington, Bond-Indiana, Gervey-New York, McFarlane-New York).

9.1 Not in competitive employment
On the primary outcome there was a difference in favour of supported employment at four, six, nine, 12, 15 and 18 months, e.g. at four months n=364, RR random effects 0.75 CI 0.64 to 0.89, and at 12 months, n=484, RR random effects 0.76 CI 0.64 to 0.89, NNT 4.5 CI 4.48 to 4.63. At 12 months 34% of clients were employed in the Supported Employment group, but only 12% in the Pre-vocational Training group. There was no significant heterogeneity on this variable at any time point.

9.2 Secondary employment outcomes
Three trials found that clients in Supported Employment had significantly more hours per month in competitive employment than those receiving Pre-vocational Training (Table 01). Three of four trials also found that clients in Supported Employment had higher mean monthly earnings that those in the Pre-vocational Training (Table 02).

9.3 Clinical outcomes
There was no significant difference in participation rates between Supported Employment and control at six, 12, and 18 months (12 month data analysed using random effects model due to heterogeneity). Drake-New Hampshire1 reported no difference in overall functioning (General Assessment Scale, Endicott 1976), self-esteem (Rosenberg scale, Rosenberg 1969) or mental state (BPRS scale, Lukoff 1986), but did not report any raw data. Drake-Washington reported no significant differences at six, 12 and 18 months in: (a) Global outcome (GAS, e.g. at 18 months Supported Employment 45.8 (SE 1.43), control 46.0 (SE 1.78)); (b) Self-esteem (Rosenberg Scale, e.g. at 18 months Supported Employment 18.5 (SE 0.7), control 18.1 (SE 0.68), (c) Quality of Life (Lehman's scale, Lehman 1983, e.g. at 18 months Supported Employment 5 (SE 0.17), control 4.8 (SE 0.18)) or (d) psychiatric symptoms (BPRS, e.g. at 18 months Supported Employment 39.2 (SE 1.19), control 41.1(SE 1.54)).

9.4 Costs
Bond-Indiana reported that the programme costs of Supported Employment were greater than for Pre-vocational Training, but that other health care costs were reduced (no statistical analysis), so that overall health care costs were less for Supported Employment. Drake-New Hampshire1 found no significant difference in program costs or overall health care costs between Supported Employment and Pre-vocational Training (Table 03).

9.5 Sensitivity Analysis
Two trials (Drake-New Hampshire1, Drake-Washington) met criteria for inclusion in the sensitivity analysis. As these trials were the only trials included in Sub-analysis 2 (see item 10, below) the results of the sensitivity analysis were the same as those of Sub-analysis 2 and were similar to those of the analysis involving all five trials.

10. SUB-ANALYSIS 2: INDIVIDUAL PLACEMENT & SUPPORT (IPS - TYPE OF SUPPORTED EMPLOYMENT) versus PRE-VOCATIONAL TRAINING
Two trials (Drake-New Hampshire1, Drake-Washington) provided data for this comparison.

10.1 Not in competitive employment
On the primary outcome there was a difference in favour of IPS clients at four, six, nine, 12, 15 and 18 months. For example, at four months, n=295, RR 0.7 CI 0.6 to 0.8, and at 12 months n=295, RR 0.79 CI 0.70 to 0.89, NNT 5.5. At 12 months 30% of people allocated to IPS were employed as against 12% in Pre-vocational Training.

10.2 Secondary employment outcomes
Both trials reported that IPS clients spent significantly more hours per month in competitive employment (Table 1). One trial (Drake-New Hampshire1) reported significantly higher mean monthly earnings, but the other (Drake-Washington) found no difference, (although the IPS grouped earned more from competitive employment - see Table 2).

10.3 Clinical outcomes
IPS clients were not significantly more likely to participate than control clients, although confidence intervals were wide and there was a trend favouring Supported Employment (n=295, RR 0.52 CI 0.15 to 1.85, random effects model). There were no significant differences between groups on: self-esteem; mental state; overall functioning; or quality of life at any time point (see 9.3 above).

10.4 Costs
Drake-New Hampshire1 found no significant difference in program costs or overall health care costs between IPS and Pre-vocational Training (Table 3).

DISCUSSION

1. General
1.1 Methodological limitations affecting the ability to detect improved outcomes
The review found little evidence that Supported Employment or Pre-vocational Training improved symptoms, quality of life or social functioning. This finding is difficult to interpret, however, as

only a minority of participants in vocational rehabilitation trials actually find competitive employment (about one third in the most effective Individual Placement and Support trials). Therefore, a large sample would be required to detect clinically significant improvements. There were some indications that this problem was masking symptomatic improvements amongst those people who actually worked. For example, Bell-Connecticut found a significant improvement in symptoms, after financial inducements had ensured a high participation rate in the treatment group, whilst Drake-New Hampshire1 reported a sub-analysis of mental state data showing a significant improvement in clients who obtained competitive work.

1.2 Generalisability
There was no evidence that vocational rehabilitation trials were 'cherry-picking' clients who were likely to be easy to place in employment. Thus a weighted average of participants in Supported Employment versus Pre-vocational Training trials showed good recruitment of women and ethnic minorities, with a majority of participants suffering from schizophrenia (see Included Studies table). This suggests that the findings of the review can be applied with confidence to the general population of clients with severe mental disorder. The review is however limited by the fact that all trials (bar one) were conducted in the United States. This limitation makes it uncertain how far the findings can be generalised to countries with less dynamic economies, different welfare structures, or dissimilar cultural attitudes to work.

2. PRE-VOCATIONAL TRAINING versus STANDARD COMMUNITY CARE OR HOSPITAL CARE
2.1 Employment outcomes
The review found no evidence to suggest that Pre-vocational Training was more effective on the primary outcome than standard community care or hospital care. This was supported by findings on other secondary employment outcomes (although Pre-vocational Training performed slightly better on some secondary outcomes when compared against a hospital control group).

2.2 Clinical outcomes and costs
Clients were not more likely to engage in Pre-vocational Training than standard care. Whilst clients in Pre-vocational Training programs appeared less likely to be admitted to hospital than clients receiving standard community care, heterogeneity was present on this outcome and reanalysis using a random effects model found no significant difference, although the result is borderline (RR random effects 0.71 CI 0.48 to 1.04). There were only limited data on costs.

2.3 Sub-analysis
This showed that there was insufficient evidence to judge whether the Clubhouse approach was more effective than other approaches to Pre-vocational Training.

2.4 Modifications of Pre-vocational Training
There was some evidence that payment improved engagement in Pre-vocational Training and enhanced its effectiveness. The effect of psychological interventions to enhance motivation was less certain, although there were some promising indications.

3. SUPPORTED EMPLOYMENT versus PRE-VOCATIONAL TRAINING
3.1 Employment outcomes
The main finding of the review was that on the primary outcome, finding competitive employment, Supported Employment was superior to Pre-vocational Training. Evidence supporting this finding was strong: five randomised trials (n=484) showed that people in Supported Employment were significantly more likely to be in competitive employment at six time points across 18 months. There was no evidence of heterogeneity at any time point. A sensitivity analysis excluding all but the two highest quality trials did not substantially alter this finding. Secondary outcomes such as mean hours worked and mean monthly earnings favoured Supported Employment.

3.2 Clinical outcomes and costs
Data were inconclusive, but suggested no major differences between Supported Employment and Pre-vocational Training.

3.3 Sub-analysis
Data suggested that Individual Placement and Support was an effective form of Supported Employment, but were insufficient to say whether it was more effective than other less carefully specified forms of Supported Employment.

Only one trial (Chandler-LongBeach) compared Supported Employment to standard community care. Although this trial suggested that Supported Employment was superior to standard community care, its findings are difficult to interpret as the intervention group received Assertive Community Treatment in addition to Supported Employment.

AUTHORS' CONCLUSIONS

Implications for practice

This review has suggested that Supported Employment is more effective than Pre-vocational Training in helping mentally ill people obtain competitive employment. Although Supported Employment is growing in popularity, it is still less widely available than Pre-vocational Training.

Finding competitive employment is a top priority for many mentally ill people, so the vocational rehabilitation agencies that serve them need to consider how to make Supported Employment more widely available. Purchasers, clinicians and clients should encourage vocational rehabilitation agencies to develop and evaluate more US-style Supported Employment schemes.

Implications for research

The effects of Supported Employment should be examined in larger, multi-centre trials, both within and outside of the United States. Such research is particularly indicated in countries with high rates of unemployment and more extensive welfare systems. Future trials should involve detailed analyses of the cost-effectiveness of the various vocational rehabilitation models. The trials should also involve standard care control groups, to establish whether there is an effect on hospital admission rates. Researchers planning future trials of Supported Employment should consider standardising this intervention by adhering to the carefully specified Individual Placement and Support model. Research is also indicated to determine how far Pre-vocational Training (including the Clubhouse approach) affects readmission/relapse rates under modern conditions. Further research is also required to determine how far mental state and social outcome may be improved by working. Methodological considerations may mean that such research may have to take place outside the framework of randomised controlled trials. Finally, there is a case

for countries to survey their existing vocational rehabilitation agencies to determine the extent to which the most effective interventions are being offered.

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* Indicates the major publication for the study

CHARACTERISTICS OF STUDIES

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

Beard-NewYork

Methods	Allocation: by day of application - patients referred on every fourth day allocated to control group.

Beard-NewYork *(Continued)*

	Follow up: every 3 months for two years.* Lost to follow-up: 14%, hard to verify from data. Objectivity of rating of outcome: raters not independent.
Participants	Inclusion criteria: i. discharged from in-patient psychiatric care in last 4 months; ii. in-patient >2 months; iii. no primary diagnosis of substance abuse, "overt homosexuality", epilepsy, "criminal behaviour"; iv. local resident. Diagnosis: schizophrenia, schizophrenia-like disorders (82%). N=352. Age: 68% under 35. Sex: 40% women. Race: 12% non-white. History: ever married 23%, ever employed U/K, time since last employment U/K, previous admissions >1. Setting: urban psychiatric rehabilitation centre, New York, USA.
Interventions	1. Clubhouse group: i. social activities; ii. "work-ordered day" on work-crews; iii. transitional employment for 3-4 months after completing phases i. + ii.; iv. real job placement with outreach and supported accommodation (mean daily attendance ˜75, 10 F/t staff, mainly psychiatric social workers, emergency psychiatric consultation provided by P/t psychiatrist. N=274. 2. Control: continued to receive community care from other services (not specified). N=78.
Outcomes	In competitive employment.* In any form of employment. Not participating in program. Rehospitalised.
Notes	* Not all patients followed up for a full two years - patients continued to enter the study until the last 3 months. Thus numbers followed up are different at different time points.

Risk of bias

Bias	Authors' judgement	Support for judgement
Allocation concealment?	High risk	C - Inadequate

Becker-Fort Worth

Methods	Allocation: 'randomly assigned' - no details given. Follow up: 8 months.* Lost to follow-up: 0%. Objectivity of rating of outcome: unclear.
Participants	Inclusion criteria: i. age <62; ii. in psychiatric hospital >2 years in last 4; iii. no dementa or severe disability; iv. not about to be discharged; v. no unpredictable violence (149/411in-patients excluded, random sample of 50 selected from remainder). Diagnosis: schizophrenia, schizophrenia-like disorders (78%). N=50. Age: mean ˜46 years. Sex: not reported. Race: not reported. History: ever married U/K, ever employed >50%, time since last employment >2 years, previous admissions >1, mainly veterans or seamen. Setting: general psychiatric hospital, Texas, USA.

Becker-Fort Worth *(Continued)*

Interventions	1. Specialised rehabilitation ward: i. intensive multi-disciplinary input; ii. social skills groups; iii. group and individual vocational assignments; iv. tours of local industrial facilities; v. sheltered workshop; vi. transitional work experience in local community enterprises. N=25. 2. Control: continuing inpatient treatment on rehabilitation wards, option of referral to external vocational rehabilitation services. N=25.
Outcomes	In competitive employment. In any employment. Discharged from hospital. Lost to follow up.
Notes	* The full trial was three phases lasting for total of 20 months - only phase 1 is relevant to this review.

Risk of bias

Bias	Authors' judgement	Support for judgement
Allocation concealment?	Unclear risk	B - Unclear

Bell-Connecticut

Methods	Allocation: 'randomised' - method not specified. Follow up: 5 months. Lost to follow-up: 4%. Objectivity of rating of outcome: independent raters.
Participants	Inclusion criteria: i. diagnosis of schizophrenia or related disorder; ii. stable (no changes in drugs, housing or treatment status in month); iii. no organic brain disease or physical disability. Diagnosis: schizophrenia, schizophrenia-like disorders (100%). N=150. Age: mean ˜43 years. Sex: 4% women. Race: 31% non-white. History: ever married U/K, ever employed U/K, time since last employment U/K, previous admissions ˜8.5. Setting: general hospital, Conneticut, USA.
Interventions	1. Sheltered set-aside jobs in the hospital: i. up to 20 hours/week; ii. paid $3.4/hour; iii. worked alongside regular hospital staff in posts ranging from administrative to portering; iv. attended weekly 50 minute support group. N=80. 2. Control: as above but not paid. N=70. Both groups continued to receive benefit entitlement.
Outcomes	In any type of employment.* Monthly earnings. Not participating in program. Rehospitalised. Mental state: PANSS. Unable to use - Time in any form of employment (not primary or secondary outcome variable).
Notes	* People lost to follow up treated as not working. 6 patients in control group transferred to half-way house and excluded because it had its own work program - treated as working and as not dropping out.

Risk of bias

Bell-Connecticut *(Continued)*

Bias	Authors' judgement	Support for judgement
Allocation concealment?	Unclear risk	B - Unclear

Blankertz-Philadelph

Methods	Allocation: random allocation with "oversampling of experimental group" - not clear what this means.* Follow up: 9 months. Lost to follow-up: 0%. Objectivity of rating of outcome: raters not independent.
Participants	Inclusion criteria: i. severe mental illness (unspecified); ii. unemployed; iii. client of CMHC. Diagnosis: schizophrenia, schizophrenia-like disorders (72%). N=122. Age: mean 36 years. Sex: 36% women. Race: 20% non-white. History: ever married 16%, ever employed 82%, time since last employment ˜9 years, previous admissions U/K. Setting: CMHC, Philadelphia, USA.
Interventions	1. Two employment specialists: using counselling, social learning techniques, group sessions, rewards for passing up a "ladder" of success (making positive changes, setting goals, making transition to state vocational rehabilitation centre, entering the world of work). No specific prevocational training, but some job finding for a few who did not want to enter the VR system, plus usual CMHT. N=61. 2. Control: usual services of CMHT: including partial hospitalisation, outpatient services, therapy and medication management. No specific vocational services, but could have referral to state VR service. N=61.
Outcomes	In competitive employment. Not participating in program. In any form of employment or education. Unable to use - Self-esteem: Rosenberg's scale (no comparison with control group). Social functioning: Social Level of Functioning Scale (no comparison with control group).
Notes	* Method of randomisation unusual - the paper suggests that a high drop-out rate after randomisation led to replacement of people in the treatment group - but this is not explicit. It is possible that this is not an intention to treat analysis.

Risk of bias

Bias	Authors' judgement	Support for judgement
Allocation concealment?	Unclear risk	B - Unclear

Bond-Chicago1

Methods	Allocation: random assignment - information from trialists indicates that sealed envelope method was used. Follow up: 4,9,15 months. Lost to follow-up: 18%. Objectivity of rating of outcome: raters not independent.

Bond-Chicago1 *(Continued)*

Participants	Inclusion criteria: i. age >18; ii. no prior participation in program; iii. unemployed; iv. wanting employment; v. attendance of >40 hours in first 4 weeks after admission (drop-out rate of 20% before screening). Diagnosis: schizophrenia, schizophrenia-like disorders (55%). N=131. Age:mean ˜25 years. Sex: 31% women. Race: 25% non-white. History: ever married U/K, ever employed 72%, time since last employment 9 months, previous admissions U/K but 48% >3 admissions. Setting: urban, private psychosocial rehabilitation agency, Chicago, USA.
Interventions	1. Immediate job placement: i. paid transitional employment (minimum 2 days/week); ii. no prevocational preparation; iii. strong expectation to engage in paid employment; iv. close supervision by staff member. N=64. 2. Control: i. gradual approach to supported employment; ii. remained in unpaid prevocational work crew (minimum 4 months); iii. followed 'standard' schedule; iv. if placement failed returned to work crews before starting again; v. volunteer placements also available. N=67. Both groups could participate in individual and group counselling, evening support groups and a job-club.
Outcomes	In competitive employment. In any employment. Monthly earnings. Not participating in program. Rehospitalised. In any form of employment or education. Unable to use - Time in employment (not primary or secondary outcome).
Notes	

Risk of bias

Bias	Authors' judgement	Support for judgement
Allocation concealment?	Unclear risk	B - Unclear

Bond-Indiana

Methods	Allocation: 'randomly assigned' - information from trialists indicates that randomisation was by an independent co-ordinator using sealed envelopes. Follow up: 12, 24, 48 months. Lost to follow-up: 14% at 1 year, 6% at 4 years - only 1 site followed up at 4 years. Objectivity of rating of outcome: raters not independent.
Participants	Inclusion criteria: i. age 18-60; ii. severe mental disorder (Indiana Department of Mental Health Criteria - based on diagnosis, disability & duration); iii. eligible for disability benefit; iv. enrolled in the CMHC community support program; v. no recent V-R; vi. unemployed >3 months; vii. wanting to work; viii. consistent attendance at CMHC over preceding 4 weeks. Diagnosis: schizophrenia, schizophrenia-like disorders (66%). N=86. Age: mean ˜35 years. Sex: 49% women. Race: 20% non-white.

Bond-Indiana *(Continued)*

	History: ever married 52%, ever employed 82%, time since last employment 38 months, previous admissions 5.3. Setting: 4 CMHTs, 57%:43% urban:rural population, Indiana, USA.
Interventions	1. Immediate entry into supported employment: >4 months preparation in prevocational work-readiness training then rural CMHC provided i. 2 employment specialists (employed by CMHC, receiving internal referrals, 1 client at a time, intensive job-coaching at beginning of placement.); ii. follow-on staff worker (maintained contact after initial adjustment phase) and urban CMHCs provided 3 employment specialists (liaised with teams, carried individual case loads). N=43. 2. Control: >4 months preparation in prevocational work-readiness training. N=43.
Outcomes	In competitive employment. Not participating in program. Monthly earnings. Costs: program costs, all heatlh care costs. Unable to use - In competitive employment at 48 months (follow up <50%). Admitted to hospital (no data). Time in any employment (not a primary or secondary outcome variable).
Notes	Two separate trials described in the reports. Both involve accelerated placement in supported employment. One involves VR team integrated into a CMHC, the other, an independent VR team liaising with 4 different CMHCs. Not possible to report all data separately for the two trials. The integrated site has a slightly better outcome for the accelerated group.

Risk of bias

Bias	Authors' judgement	Support for judgement
Allocation concealment?	Low risk	A - Adequate

Chandler-LongBeach

Methods	Allocation: 'randomised' - no further details. Follow up: 12, 24, 36 months. Lost to follow up: 21% at 1 year, 29% at 3 years. Objectivity of rating of outcome: raters independent.
Participants	Inclusion criteria: i. "serious & persistent mental disorder" (DSM-III-R); ii. no primary diagnosis of substance abuse; iii. substantial functional impairment due to mental disorder (not defined); iv. eligible for public assistance as a result of functional impairment. Diagnosis: schizophrenia, schizophrenia-like disorders (55.2%). N=256. Age: ˜30% over 45 years. Sex: 43% women. Race: ˜32% non-white. History: ever married 47%, ever employed U/K, time since last employment U/K but 82% >1year, previous admissions U/K. Setting: integrated services agency, California, USA.
Interventions	1. Village integrated services agency: i. assertive community treatment; ii. employment program based at central site (possible immediate entry into employment opportunities [cafe, store, catering service, client bank, janitor service]); iii. two staff to develop competitive jobs and support clients (supported employment). Finding employment was key value of program. N=127. 2. Control: usual mental health services i. limited case management; ii. limited amount of other rehabilitative services. N=129.

Chandler-LongBeach *(Continued)*

Outcomes	In competitive employment. In any employment. Monthly earnings. Admitted to hospital. Not participating in program. Costs: total mental health costs. Unable to use - Other clinical outcomes are available but unclear how far they are attributable to Assertive Community Treatment and how far to supported employment (see text for explanation).
Notes	

Risk of bias

Bias	Authors' judgement	Support for judgement
Allocation concealment?	Unclear risk	B - Unclear

Dincin-Chicago

Methods	Allocation: 'random assignment at intake' - information from trialists indicates randomisation was by independent trial co-ordinator using sealed envelopes. Follow up: 9 months. Lost to follow-up: 37%. Objectivity of rating of outcome: raters not independent.
Participants	Inclusion criteria: i. severe mental disorder; ii. accepted by agency for rehabilitation; iii. no primary diagnosis of substance abuse or mental retardation; iv. age >19. Diagnosis: schizophrenia, schizophrenia-like disorders (86%). N=132. Age: mean ˜25 years. Sex: 47% women. Race: not reported. History: ever married U/K, ever employed U/K, time since last employment U/K, previous admissions ˜3. Setting: urban, privately operated VR centre, Chicago, USA.
Interventions	1. Threshold rehabilitation program: i. individual case work; ii. work crews leading to transitional employment; iii. problem-solving and activity groups; iv. linked residential facilities (where suitable); v. special education program; vi. medication and relapse discussion group; vii. staff:patient ratio 1:10. N=66. 2. Control: 6 hours/week supportive treatment "widely used by practitioners who treat severely disturbed clients"; i. referral to existing community services where appropriate; ii. discussion and peer-support group; iii. visits fortnightly by consulting psychiatrist (prescribed and discussed medication); iv. in nearby church; v. staffed by 2 P/t workers and volunteers; vi. staff:patient ratio 1:20. N=66.
Outcomes	In competitive employment. Admitted to hospital. Not participating in program.* Costs of care.
Notes	*15 people in each group excluded from further analysis after randomisation because they failed to participate in programs - have been added to the denominator for number not participating.

Risk of bias

Dincin-Chicago *(Continued)*

Bias	Authors' judgement	Support for judgement
Allocation concealment?	Low risk	A - Adequate

Drake-New Hampshire1

Methods	Allocation: 'randomly assigned' - information from trialists indicated that randomisation was by an off-site co-ordinator using computer-generated random numbers. Follow up: monthly for 2 years (preceded by 4 once-weekly "informational" meeting). Lost to follow-up: 2%. Objectivity of rating of outcome: raters independent.
Participants	Inclusion criteria: i. major mental illness with major role dysfunction for past 2 years; ii. in community >1 month; iii. living locally; iv. age 20-65 years; v. unemployed >1 month, wanting to work; vi. no substance dependence, physical disability, or memory impairment. Diagnosis: schizophrenia, schizophrenia-like disorders (46.9%). N=143. Age: mean ˜37years. Sex: 52% women. Race: 5% non-white. History: ever married 50%, ever employed - "relatively good employment history", time since last employment U/K, previous admissions U/K but "many" hospitalised in last year. Setting: urban, New Hampshire, USA.
Interventions	1. Individual placement and support program: i. integrated team working within mental health services; ii. employment specialists attached directly to clinical teams (helped clients find jobs immediately, provided on-job training, supportive follow-up); iii. 3 staff working directly with clients in all phases of supported employment (direct contact time with staff ˜62 hours). N=74. 2. Brokered model (GST) pre-employment preparation group: i. discussions of skills needed to get and keep jobs; ii. practising these skills; ii. exploration of work-related values; iii. exploration of clients' strengths and weaknesses as workers; iv. interview skills meetings; v. discussion of job leads and interviews (meetings 2/week); vi. once employed received on job support (liaison with mental health providers, follow-along support); vii. 3 staff divided functions into job training, job development, and job support roles (direct contact time with staff=74 hours). N=69.
Outcomes	In competitive employment. Time in competitive employment. Monthly earnings. Not participating in program. Global functioning: GAS scores. Self-esteem: Rosenberg's scale Mental state: BPRS expanded. Costs: program costs, all heatlh care costs. Unable to use - Quality of life: Lehman's scale (subscales only).
Notes	Two centre trial but not possible to separate the data by site.

Risk of bias

Bias	Authors' judgement	Support for judgement
Allocation concealment?	Low risk	A - Adequate

Drake-Washington

Methods	Allocation: by off-site co-ordinator using random number tables, stratified according to work history (information from trialists). Follow up: 6, 12 & 18 months. Lost to follow up: 5% at 18 months. Objectivity of rating of outcome: raters independent.
Participants	Inclusion criteria: i. severe mental disorder; ii. unemployed; iii. no memory impairment or medical illness precluding working/participating in job interviews. Diagnosis: schizophrenia, schizophrenia-like disorders (67%). N=152. Age: mean ˜39 years. Sex: 61% women. Race: 83% non-white. History: ever married 34%, ever employed U/K, time since last employment U/K, previous admissions U/K. Setting: urban, Washington DC, USA.
Interventions	1. Individual Placement and Support (IPS): i. rapid job search; ii. follow-on support after securing work (counselling, transportation, intervening with employer); iii. 3 employment specialists (25 clients each). N=76. 2. Enhanced Vocational Rehabilitation (EVR): i. VR service enhanced by extra VR counselor who monitored clients' satisfaction with service; ii. goal of competitive employment but involved prevocational experiences, work adjustment training in sheltered workshop (primarily paid). N=76.
Outcomes	In competitive employment. Monthly earnings. Mental state: BPRS expanded. Quality of life: Lehman's scale. Self-esteem: Rosenberg's scale. Unable to use - In any employment throughout study (not primary or secondary outcome). Satisfaction with leisure/finances/job/housing/town (sub-scale of Lehman's scale). Time to find employment (not primary or secondary outcome measure). Days in hospital (not primary or secondary outcome measure).
Notes	

Risk of bias

Bias	Authors' judgement	Support for judgement
Allocation concealment?	Low risk	A - Adequate

Gervey-New York

Methods	Allocation: 'randomly assigned' - information from trialists indicates this was "lots drawn from a hat". Follow up: 12 months (preceded by assessment and vocational skills training phase). Lost to follow-up: 0% - difficult to verify. Objectivity of rating of outcome: raters independent.
Participants	Inclusion criteria: i. severely disabled by major mental illness (SCID); ii young (not specified). Diagnosis: schizophrenia, paranoid personality disorder, major affective disorder, attention deficit disorder, oppositional-defiant disorder (proportions U/K). N=34. Age: mean ˜19 years.

Gervey-New York *(Continued)*

	Sex: 33% women. Race: 83% non-white. History: ever married U/K, ever employed 20%, time since last employment U/K, previous admissions U/K, from low-income families. Setting: densely populated urban centre, New York, USA.
Interventions	1. Immediate placement in supported employment: support provided through job coaches or a family/peer support group. N=22.* 2. Control: employment training in sheltered workshop setting with weekly individual, family and peer group therapy. N=12.
Outcomes	In competitive employment. Time in competitive employment.
Notes	* Originally 2 groups: a. job placement plus job coaching; and b. job placement with family and peer support. No differences between these 2 groups and are combined into a single experimental group for this review.

Risk of bias

Bias	Authors' judgement	Support for judgement
Allocation concealment?	High risk	C - Inadequate

Griffiths-London

Methods	Allocation: 'randomised' - no further details. Follow up: 18 months (mean). Loss to follow up: 0%. Objectivity of rating of outcome: unclear if raters independent.
Participants	Inclusion criteria: i. psychotic illness; ii. in contact with psychiatric services during 12 month period beginning 1968; iii. age range 18-55 years. Diagnosis: all had a psychotic illness, specific diagnoses U/K. N=28. Age: U/K. Sex: U/K. History: U/K. Setting: urban, London, UK.
Interventions	1. Rehabilitation program: i. co-ordinated program involving day hospital and industrial workshops; ii. patients treated by team (psychiatrists, nurses, OTs, psychologists); iii. comprehensive assessment used to plan individual treatment and rehabilitation programs. N=14. 2. Control: i. referred back to doctors; ii. mainly in day centres, at home or in hosptial. N=14.
Outcomes	In competitive employment. Self esteem: Wing scale. Unable to use - Cognitive functioning: WAIS. Attitude: Attitude Rating Scale (unpublished).
Notes	

Risk of bias

Griffiths-London *(Continued)*

Bias	Authors' judgement	Support for judgement
Allocation concealment?	Unclear risk	B - Unclear

Kline-Philadelphia

Methods	Allocation: "randomly assigned" - no further details. Follow up: 6 months. Lost to follow up: 0%. Objectivity of rating of outcome: unclear if raters were independent.
Participants	Inclusion criteria: i. midway through a 1 year rehabilitation program; ii. psychiatrically disabled (not defined). Diagnosis: schizophrenia, schizophrenia-like disorders (40%). N=20. Age: mean ˜28 years. Sex: "predominantly male". Race: not reported. History: ever married U/K, ever employed 100%, time since last employment U/K, previous admissions U/K. Setting: psychosocial rehabilitation agency, Philadelphia, USA.
Interventions	1. Employment group: i. met in group to discuss work values (1.5 hours/week for 12 weeks); ii. VR counsellors were group facilitators; iii. aimed to reduce placement anxiety. N=10. 2. Control: usual VR services. N=10. Both groups received usual services from the VR program including entering a job search workshop.
Outcomes	Obtaining competitive employment. Not participating in program.
Notes	

Risk of bias

Bias	Authors' judgement	Support for judgement
Allocation concealment?	Unclear risk	B - Unclear

Kuldau-California

Methods	Allocation: by sealed envelope method. Follow up: 18 months. Lost to follow-up: 5%. Objectivity of rating of outcome: unclear if raters were independent.
Participants	Inclusion criteria: i. new admission to VA hospital; ii. residing locally. Diagnosis: schizophrenia, schizophrenia-like disorders (>27%). N=94. Age: mean ˜41 years. Sex: all men. Race: not reported. History: ever married 74%, ever employed U/K but 12% unemployed for 5 years, time since last employment U/K, previous admissions, mean ˜3.

Kuldau-California *(Continued)*

	Setting: California, USA.
Interventions	1. Treatment program: combination of i. inpatient care (in therapeutic community milieu); ii. transitional day hospital care; iii. community housing; iv. supported/sheltered work. An employment co-ordinator (ex-patient) i. scanned community for job possibilities; ii. worked with patients to help find employment; iii. placed people in jobs. Patients i. worked through the 'progress and planning group' until a "work-readiness" committee declared them fit for work; ii. could independently seek work own or through this service. Staff liaision with employers about on-the-job problems. N=44. 2. Control: i. 'rapid' discharge with emphasis on discharge planning; ii. no housing or community employment service but emphasised work activities such as unpaid industrial therapy assignments in hospital. N=50.
Outcomes	Monthly earnings. Unable to use - Ever employed during study (not a primary or secondary outcome variable. Time in competitive employment (data unclear). Living in community at end of study (not a primary or secondary outcome variable).
Notes	

Risk of bias

Bias	Authors' judgement	Support for judgement
Allocation concealment?	Low risk	A - Adequate

McFarlane-New York

Methods	Allocation: 'randomly assigned' - no further details. Follow up: 3 monthly for 18 months, partial follow up at 24 + 30 months. Lost to follow-up: 16% at 18 months. Objectivity of rating of outcome: raters independent.
Participants	Inclusion criteria: i. age 18-55; ii. family available; iii. interested in obtaining a job; iv. in treatment at site clinics; v. schizophrenia, schizoaffective disorder, bipolar disorder or major depression. Diagnosis: schizophrenia, schizophrenia-like disorders (65%). N=69. Age: mean ˜33 years. Sex: 30% women. Race: 7% non-white. History: ever married 26%, ever employed U/K, time since last employment, mean ˜15 months, previous admissions, mean ˜5. Setting: 2 CMHCs, 1 urban, 1 rural, New York State, USA.
Interventions	1. Family-aided Assertive Community Treatment: i. ACT; ii. family intervention; iii. vocational specialists: specialists' tasks a. developing contacts with employers; b. case-specific job development; c. job assessment; d. assessment of patients' cognitive, physical and social capacities; e. setting career goals; f. interview and resume practice and assistance; g. on or near job support; h. intervening with employers; i. close co-ordination with clinicians. N=37. 2. Control: conventional vocational rehabilitation with referral to state VR service often leading to placement in sheltered workshop. N=32.
Outcomes	Obtaining competitive employment. Obtaining any form of employment. Not participating in program Monthly earnings.

McFarlane-New York *(Continued)*

	Unable to use - Obtaining competitive employment at 30 months (follow up <50%) Admissions to hospital per patient (not a secondary outcome). Mental state (not reported by group).
Notes	

Risk of bias

Bias	Authors' judgement	Support for judgement
Allocation concealment?	Unclear risk	B - Unclear

Okpaku-Nashville

Methods	Allocation: 'randomly assigned' - no further details. Follow up: 7 to 28 months.* Lost to follow-up: 0% - difficult to verify. Objectivity of rating of outcome: raters independent.
Participants	Inclusion criteria: i. serious mental illness as judged by eligibility for disability benefits; ii. client of CMHC. Diagnosis: schizophrenia, schizophrenia-like disorders (67%). N=152. Age: mean ˜37 years. Sex: 41% women. Race: 40% non-white. History: ever married 52%, ever employed U/K, time since last employment U/K, previous admissions ˜3. Setting: urban, Tenessee, USA.
Interventions	1. Employment oriented case management:** i. multi-disciplinary team of rehabilitation specialists (case load/specialist ˜10); ii. employment needs assessment; iii. regular review; iv. "aggressively pursued social and rehabilitative services". N=73. 2. Control: standard case management services from CMHC (case load 40-90). N=79.
Outcomes	Finding any employment Not participating in program. Unable to use - Cost data (insufficient data).
Notes	* Variable follow up period - all received 4 month intervention and one 3 month follow up interview, some followed up as long as 24 months. ** Not an assertive community treatment model - not explicit what the intervention was, but not supported employment.

Risk of bias

Bias	Authors' judgement	Support for judgement
Allocation concealment?	Unclear risk	B - Unclear

Walker-Massachusetts

Methods	Allocation: by table of random numbers. Follow up: 6 months. Lost to follow-up: 0%. Objectivity of rating of outcome: raters not independent.
Participants	Inclusion criteria: i. hospital in-patient + 2 successful weeks in hospital work program; ii. recommended as capable of work by rehabilitation therapist; iii. willing to work; iv. cleared as suitable by psychiatrist. Diagnosis: schizophrenia, schizophrenia-like disorders (50%). N=28. Age: U/K. Sex: all men. Race: U/K. History: ever married U/K, ever employed U/K, time since last employment U/K, previous admissions U/K. Setting: urban, Massachusetts, USA.
Interventions	1. Community-based Hospital Industrial Rehabilitation Placement (CHIRP): i. placements in a regular industrial setting off grounds (˜a form of paid sheltered workshop); ii. supervision by member of rehabilitation staff from hospital; iii. transport; iv. could continue to attend after leaving hospital; v. standard hospital and community care. N=14. 2. Control: standard hospital and community care, could not attend CHIRP. N=14.
Outcomes	Time in competitive employment (excluding CHIRP) Not participating in program. Unable to use - Obtaining competitive employment (data unclear). Earnings: median monthly (no mean, SD).
Notes	

Risk of bias

Bias	Authors' judgement	Support for judgement
Allocation concealment?	Low risk	A - Adequate

Wolkon-Cleveland

Methods	Allocation: 'random assignment' - no further details except randomisation took place before consent was obtained (207 of 333 patients assigned to control group refused to participate). Follow up: 12, 18, 24, 30 months. Lost to follow-up: 8%. Objectivity of rating of outcome: raters independent.
Participants	Inclusion criteria: i. age 20-60; ii. >1 month psychiatric hospitalisation + about to be discharged; iii. no primary diagnosis of substance abuse, mental retardation or organic brain disease.* Diagnosis: schizophrenia/schizophrenia-like disorders (78%). N=540. Age: mean ˜36 years. Sex: 65% women. Race: 43% non-white. History: Ever married U/K, ever employed U/K, time since last employment U/K, previous admissions >2. Setting: urban, non-residental, transitional, social rehabilitation centre for adults recently released from psychiatric hospital, Ohio, USA.

Wolkon-Cleveland *(Continued)*

Interventions	1. Rehabilitative treatment: i. social group work; ii. individual counselling; iii. transitional work projects; iv. informed that participation was limited to 1 year (not clear if strictly enforced). N=333. 2. Control: standard aftercare services (not specified). N=207.
Outcomes	Rehospitalised. Unable to use - In competitive employment (no data reported). Psychiatric symptoms (unpublished scale).
Notes	* A random sample of all patients about to be discharged from 3 state psychiatric hospitals over a 2.5 year period.

Risk of bias

Bias	Authors' judgement	Support for judgement
Allocation concealment?	Unclear risk	B - Unclear

BPRS - Brief Psychiatric Rating Scale.
PANSS - Positive and Negative Symptom Scale.
ACT - Assertive Community Tretment.
CMHC - Community Mental Health Centre
SCID
U/K - unknown.
P/t - part time.
F/t - full time.
VR - vocational rehabilitation.
DSM-III-R - Diagnostic Statistical Manual, version 3, revised.

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

Study	Reason for exclusion
Adams-Shollenberger	Allocation: not randomised, a survey comparing absenteeism rates.
Ax-Salem	Allocation: randomised. Participants: diagnosis unclear, at least one third had alcohol problems only, hence excluded. Intervention: PVT (job club) versus no intervention.
Azrin-Illinois	Allocation: randomised (coin flip). Participants: diagnosis unclear, not all severely mentally ill, many had physical handicaps alone, hence excluded. Intervention: PVT (job club) versus advice on finding work.
Bailey-New Hampshire	Allocation: not randomised, before and after study.
Becker-Boston	Allocation: not randomised, retrospective case series.
Bell-Connecticut2	Allocation: not randomised (quasi-experimental study comparing a hospital-based VR program with two other inpatient treatment units).
Block-Canada	Allocation: not randomised, before and after study.
Bond-Chicago2	Allocation: randomised. Participants: people with severe mental disorder

Study	Reason for exclusion
	Interventions: Assertive Community Treatment versus standard care. This trial of Assertive Community Treatment versus standard care happened to report vocational outcomes, but did not involve and any specific vocational rehabilitation intervention - hence excluded.
Briggs-Minnesota	Allocaton: randomised. Participants: people with severe mental disorder Interventions: PVT (vocational counselling) versus standard community care. Outcomes: Excluded as not possible to do an intention-to-treat analysis. The number randomised appears to be fewer than the numbers followed up. Two different conflicting figures are given for the number of people recruited - excluded pending clarification. (Even if included, the study does not report any data that could be used in the review).
Campbell-Massachus	Allocation: not randomised - quasi-experimental design. Participants: people with severe mental disorder Interventions: PVT (sheltered workshop) versus PVT (an "industry-integrated model").
Chandler-Stanislaus	(This trial is described in the same paper as the included trial Chandler-Long Beach.) Allocation: randomised. Participants: people with severe mental disorder Interventions: Assertive Community Treatment versus standard community care. This trial of Assertive Community Treatment versus standard care happened to report vocational outcomes, but did not involve and any specific vocational rehabilitation intervention - hence excluded.
Drake-New Hampshire2	Allocaton: not randomised, quasi-experimental design. Participants: people with severe mental disorder attending a two rehabilitative day centres. Intervention: SE (one day centre closed and converted to SE program) versus rehabilitative day centre.
Fabian-Maryland	Allocation: not randomised, a survey comparing employed and unemployed participants.
Faulkner-Virginia	Allocation: not randomised, before and after design.
Huxley-Colorado	Allocation: not randomised, a survey comparing patients attending a Clubhouse program with controls from a neighbouring area.
Jennings-Virginia	Allocation: randomised. Participants: diagnosis unclear, hence excluded. Interventions: PVT enhanced by a psychological group treatment for enhancing participation versus unenhanced PVT.
Kaufman-Pittsburgh	Allocaton: randomised. Participants: people with severe mental disorders referred to a self-help employment centre. Interventions: PVT approach (self-help employment centre) versus standard care - control condition unclear - all controls were referred to other VR services, but it is unclear how many (if any) actually engaged. Outcomes: no usable data - numbers randomised to treatment and control groups were not specified, hence it was not possible to report the number in employment on an intention to treat basis.
Keith-Michigan	Allocation: randomised. Participants: not all participants were mentally ill, hence excluded. Interventions: psychological approach for enhancing the effectiveness of vocational rehabilitation versus standard vocational rehabilitation counselling provided by the same agency.
Kregel-Virginia	Allocation: not randomised, a large survey of participants in Supported Employment services.
Luo-Nanjing	Allocation: not randomised, retrospective cohort study.

Study	Reason for exclusion
McAlpine-San Francis	Allocation: not randomised, quasi-experimental study comparing vocational outcome in patients receiving assertive community treatment with those receiving standard community care.
Noble-New York	Allocation: not randomised, compared clients in a Clubhouse program to those in newly developed Supported Employment Program.
Olah-Ohio	Allocation: not randomised, matched group design, examining effectiveness of a group intervention to increase self efficacy in people with mental disorder versus no intervention.
Otero-Spain	Allocation: not randomised, before and after study of a rehabilitation program for people with chronic schizophrenia.
Proudfoot-London	Allocation: randomised. Participants: not mentally ill, hence excluded. Interventions: occupational training program (incorporating cognitive behavioural therapy) versus a program that emphasised social support.
Purvis-Denver	Allocation: randomised. Participants: discharged psychiatric patients. Interventions: group "community follow-up" versus individual "community follow-up" versus a control group - experimental interventions included "vocational counseling" but did not appear to involve any active vocational rehabilitation in the sense of either prevocational training of supported employment.
Ryan-Connecticut	Allocation: randomised. Participants: patients recently discharged from hospital. Interventions: PVT versus standard community care. Outcomes: not an intention to treat analysis - patients randomly assigned whilst inpatients, but any who were judged not ready for discharge within two months were dropped from study. Similarly, any who failed to complete 3 months in the PVT after allocation were dropped. The trial seems to report data only on people who met these conditions after randomisation.
Sauter-New York	Allocation: randomised. Participants: people with chronic schizophrenia attending a sheltered work shop. Interventions: work skills training for sheltered workshop participants verus sheltered workshop alone. Outcomes: increasing productivity rates, not concerned with employment outcomes - hence excluded.
Stein-Madison	Allocation: randomised. Participants: people with severe mental illness requiring admission to hospital. Interventions: Assertive Community Treatment versus hospital admission. Vocational outcomes were reported but excluded as the intervention did not involve any specific vocational rehabilitation component.
Tomaras-Athens	Allocation: not randomised, before and after study.
Velasquez-Minnesota	Allocation: randomised. Participants: young adults with psychotic, neurotic or personality disorder. Interventions: residential milieu therapy versus standard community care. Vocational outcomes were reported, but the intervention did not involve any specific vocational component.

PVT - Pre-vocational Training
VR - Vocational Rehabilitation

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

Bond-Chicago3

Trial name or title	Thresholds DPA/IPS Study
Methods	
Participants	N=180. History: new admissions to Thresholds organisation in Chicago. Inclusion criteria: i. suffering from severe mental illness; ii. 18 or over; iii. interested in competitive employment; iv. unemployed for previous month; and v. willing to attend 2 informational group sessions to understand project's requirements.
Interventions	1. IPS model. 2. Diversified Placement Approach (DPA - a prevocational approach developed at Thresholds).
Outcomes	Employment outcomes. Substance abuse. Costs of care. Compliance.
Starting date	Started 09/99
Contact information	Gary Bond gbond@iupui.edu
Notes	

Carey-US 8 site

Trial name or title	No details available.
Methods	
Participants	
Interventions	
Outcomes	
Starting date	
Contact information	
Notes	

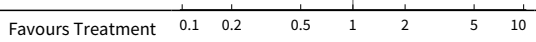
DATA AND ANALYSES

Comparison 1. PRE-VOCATIONAL TRAINING versus STANDARD HOSPITAL CARE

Outcome or subgroup title	No. of studies	No. of participants	Statistical method	Effect size
1 Not in competitive employment (at 8 months)	1	50	Risk Ratio (M-H, Fixed, 95% CI)	0.79 [0.63, 1.00]
2 Not in any form of employment (at 8 months)	1	50	Risk Ratio (M-H, Fixed, 95% CI)	0.42 [0.26, 0.68]
3 Not participating in program (excluding employed)	2	78	Risk Ratio (M-H, Fixed, 95% CI)	0.33 [0.01, 7.55]
4 Not discharged from hospital (at 8 months)	1	50	Risk Ratio (M-H, Fixed, 95% CI)	0.95 [0.76, 1.19]

Analysis 1.1. Comparison 1 PRE-VOCATIONAL TRAINING versus STANDARD HOSPITAL CARE, Outcome 1 Not in competitive employment (at 8 months).

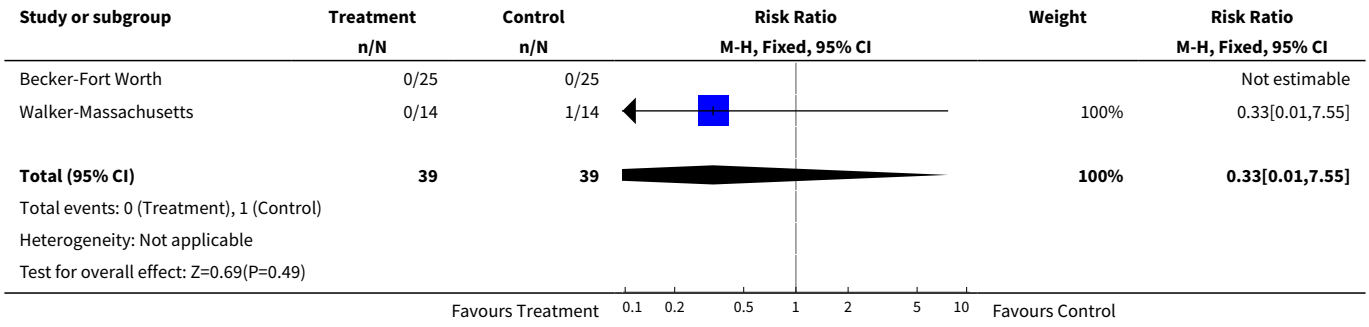
Study or subgroup	Treatment n/N	Control n/N	Risk Ratio M-H, Fixed, 95% CI	Weight	Risk Ratio M-H, Fixed, 95% CI
Becker-Fort Worth	19/25	24/25		100%	0.79[0.63,1]
Total (95% CI)	**25**	**25**		**100%**	**0.79[0.63,1]**
Total events: 19 (Treatment), 24 (Control)					
Heterogeneity: Not applicable					
Test for overall effect: Z=1.95(P=0.05)					



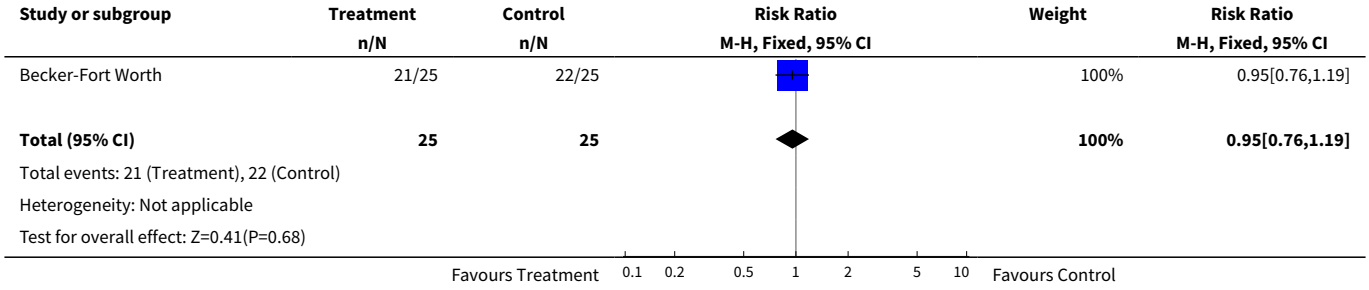
Analysis 1.2. Comparison 1 PRE-VOCATIONAL TRAINING versus STANDARD HOSPITAL CARE, Outcome 2 Not in any form of employment (at 8 months).

Study or subgroup	Treatment n/N	Control n/N	Risk Ratio M-H, Fixed, 95% CI	Weight	Risk Ratio M-H, Fixed, 95% CI
Becker-Fort Worth	10/25	24/25		100%	0.42[0.26,0.68]
Total (95% CI)	**25**	**25**		**100%**	**0.42[0.26,0.68]**
Total events: 10 (Treatment), 24 (Control)					
Heterogeneity: Not applicable					
Test for overall effect: Z=3.53(P=0)					

Analysis 1.3. Comparison 1 PRE-VOCATIONAL TRAINING versus STANDARD HOSPITAL CARE, Outcome 3 Not participating in program (excluding employed).



Analysis 1.4. Comparison 1 PRE-VOCATIONAL TRAINING versus STANDARD HOSPITAL CARE, Outcome 4 Not discharged from hospital (at 8 months).

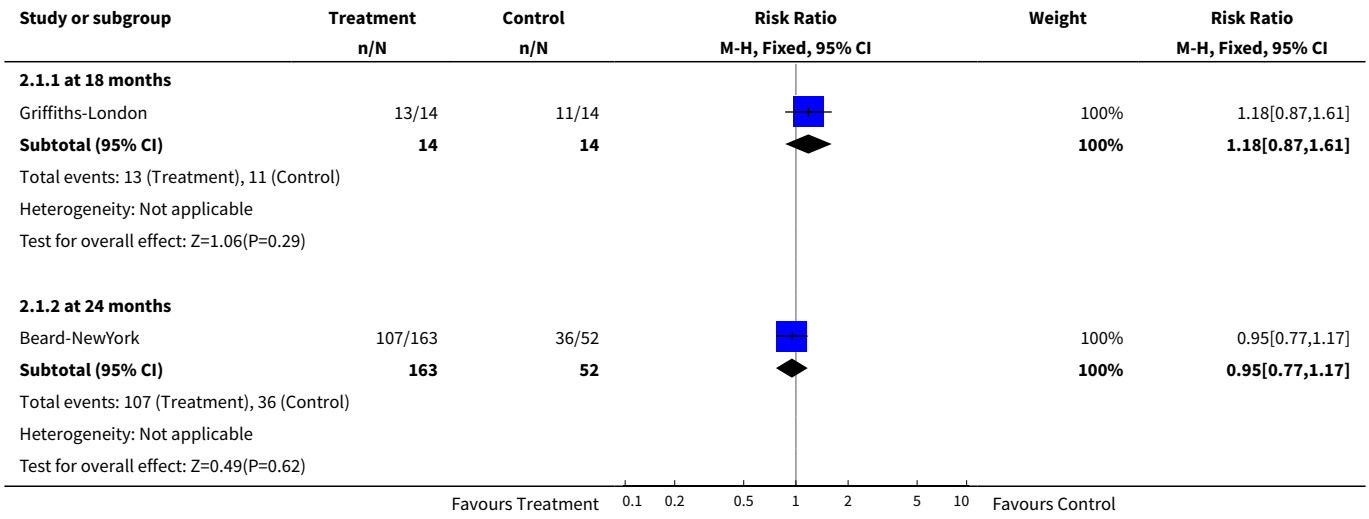


Comparison 2. PRE-VOCATIONAL TRAINING (ALL APPROACHES) versus STANDARD COMMUNITY CARE

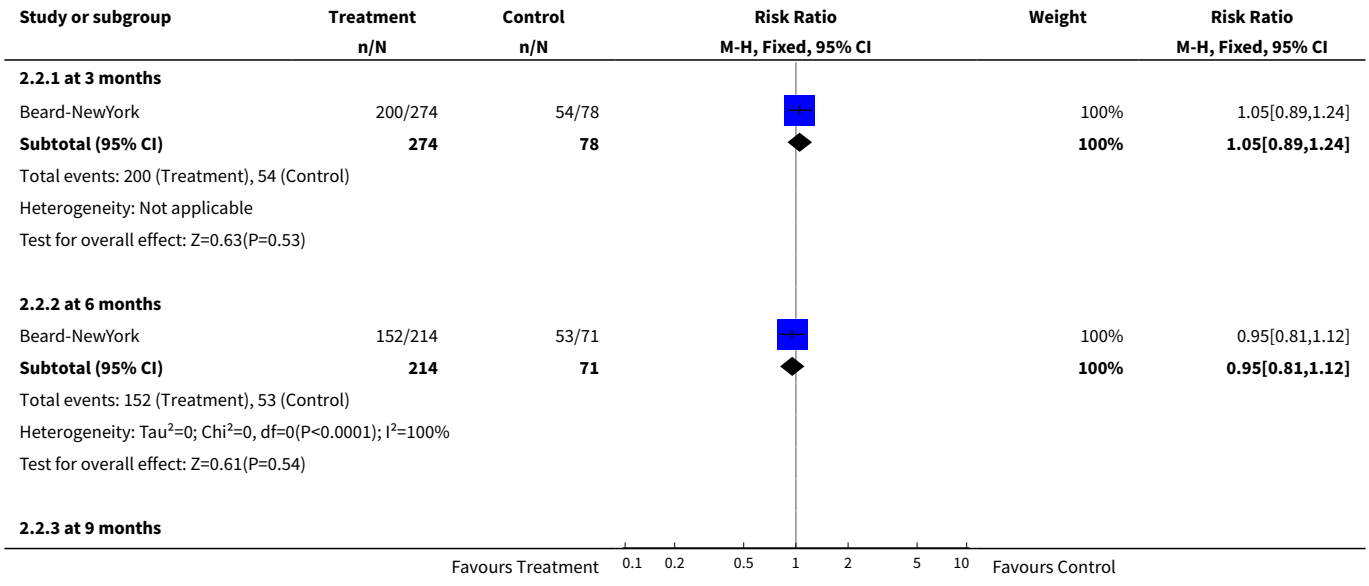
Outcome or subgroup title	No. of studies	No. of participants	Statistical method	Effect size
1 Not in competitive employment	2		Risk Ratio (M-H, Fixed, 95% CI)	Subtotals only
1.1 at 18 months	1	28	Risk Ratio (M-H, Fixed, 95% CI)	1.18 [0.87, 1.61]
1.2 at 24 months	1	215	Risk Ratio (M-H, Fixed, 95% CI)	0.95 [0.77, 1.17]
2 Not in any form of employment	3		Risk Ratio (M-H, Fixed, 95% CI)	Subtotals only
2.1 at 3 months	1	352	Risk Ratio (M-H, Fixed, 95% CI)	1.05 [0.89, 1.24]
2.2 at 6 months	1	285	Risk Ratio (M-H, Fixed, 95% CI)	0.95 [0.81, 1.12]
2.3 at 9 months	1	132	Risk Ratio (M-H, Fixed, 95% CI)	1.0 [0.76, 1.32]
2.4 at 12 months	1	215	Risk Ratio (M-H, Fixed, 95% CI)	0.95 [0.77, 1.17]
2.5 at 18 months	1	152	Risk Ratio (M-H, Fixed, 95% CI)	0.76 [0.57, 1.02]

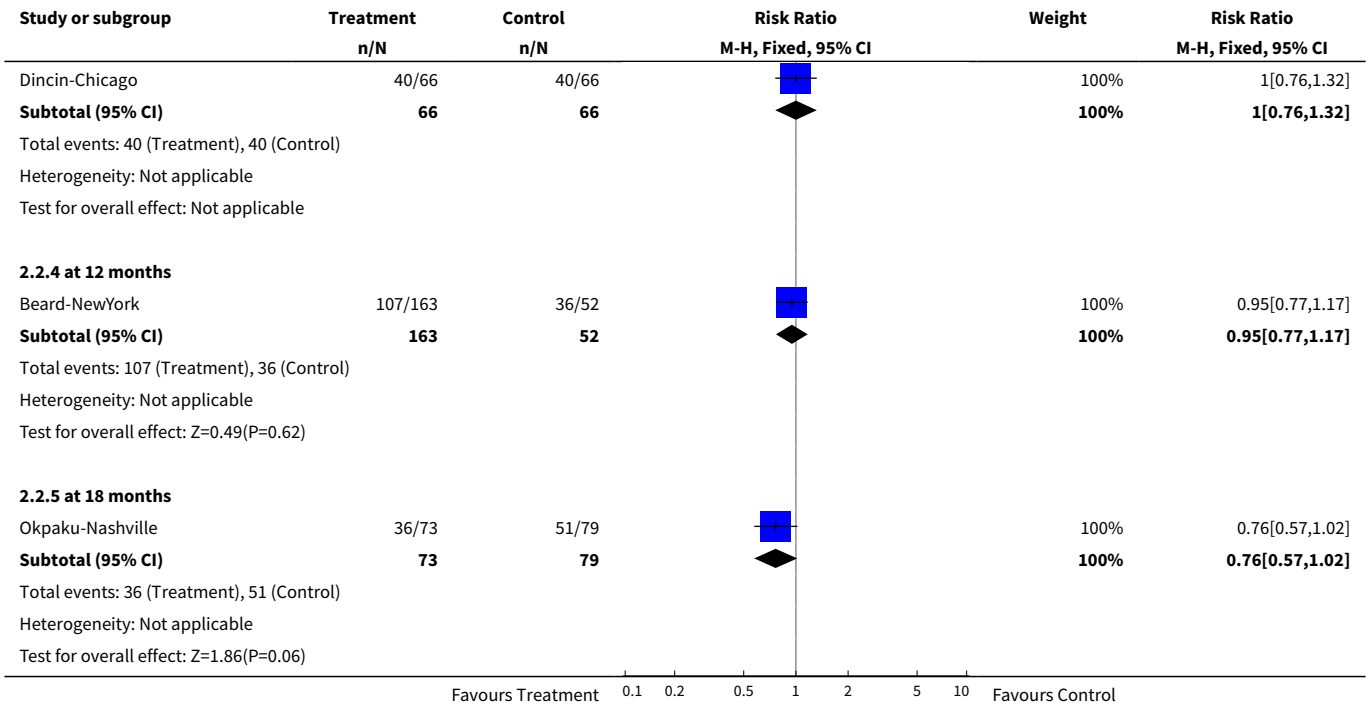
Outcome or subgroup title	No. of studies	No. of participants	Statistical method	Effect size
3 Not participating in program (excluding employed)	2	284	Risk Ratio (M-H, Random, 95% CI)	0.95 [0.52, 1.72]
4 Admitted to hospital (by 1 year)	3	887	Risk Ratio (M-H, Fixed, 95% CI)	0.79 [0.65, 0.95]

Analysis 2.1. Comparison 2 PRE-VOCATIONAL TRAINING (ALL APPROACHES) versus STANDARD COMMUNITY CARE, Outcome 1 Not in competitive employment.

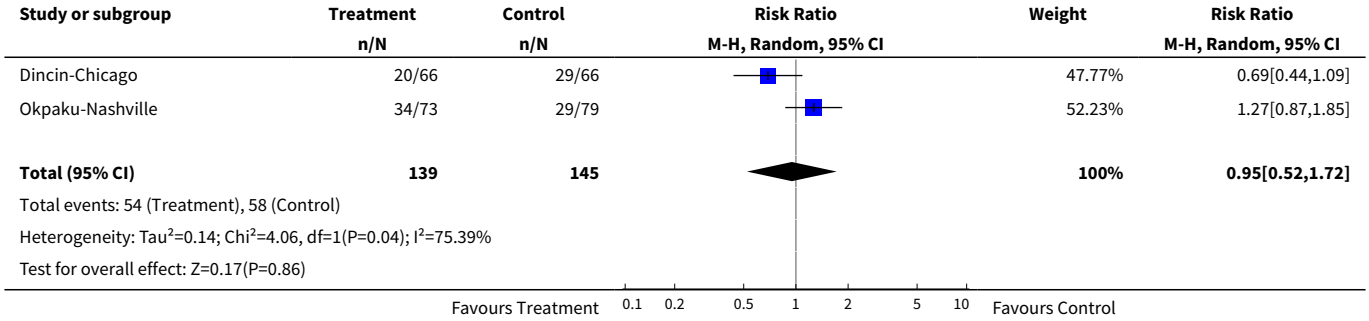


Analysis 2.2. Comparison 2 PRE-VOCATIONAL TRAINING (ALL APPROACHES) versus STANDARD COMMUNITY CARE, Outcome 2 Not in any form of employment.

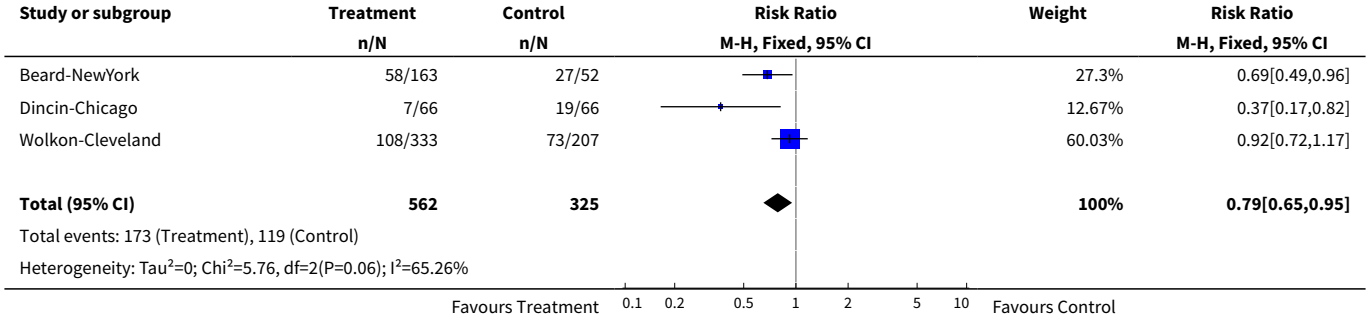


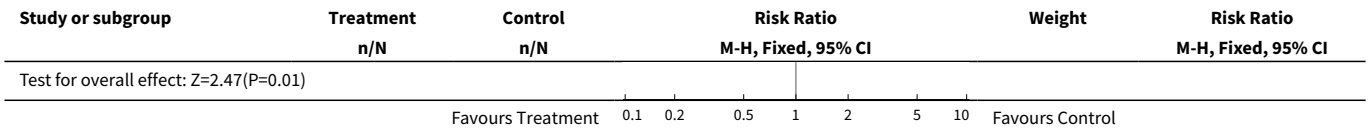


Analysis 2.3. Comparison 2 PRE-VOCATIONAL TRAINING (ALL APPROACHES) versus STANDARD COMMUNITY CARE, Outcome 3 Not participating in program (excluding employed).



Analysis 2.4. Comparison 2 PRE-VOCATIONAL TRAINING (ALL APPROACHES) versus STANDARD COMMUNITY CARE, Outcome 4 Admitted to hospital (by 1 year).

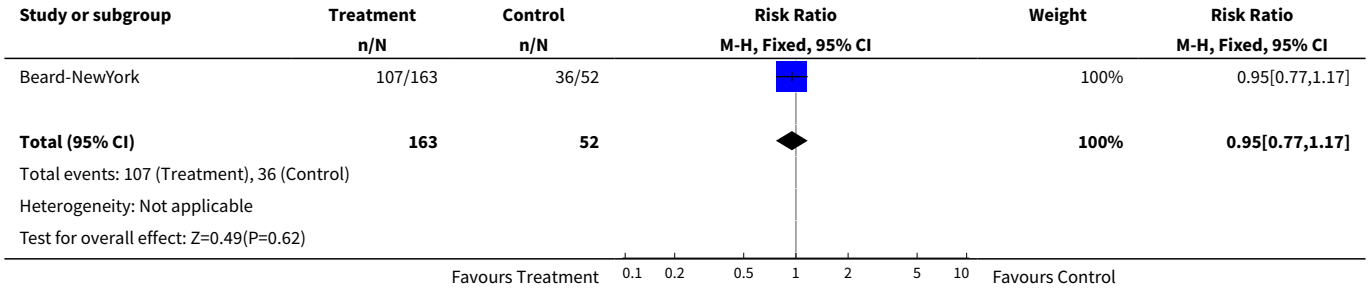




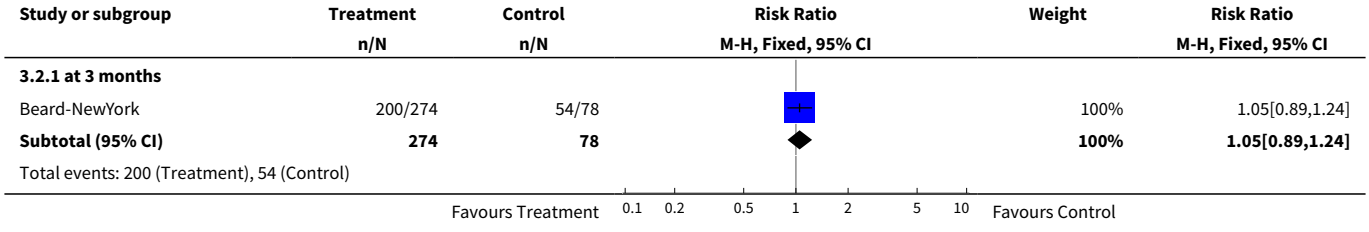
Comparison 3. SUB-ANALYSIS 1: CLUBHOUSE APPROACH (TYPE OF PVT) versus STANDARD COMMUNITY CARE

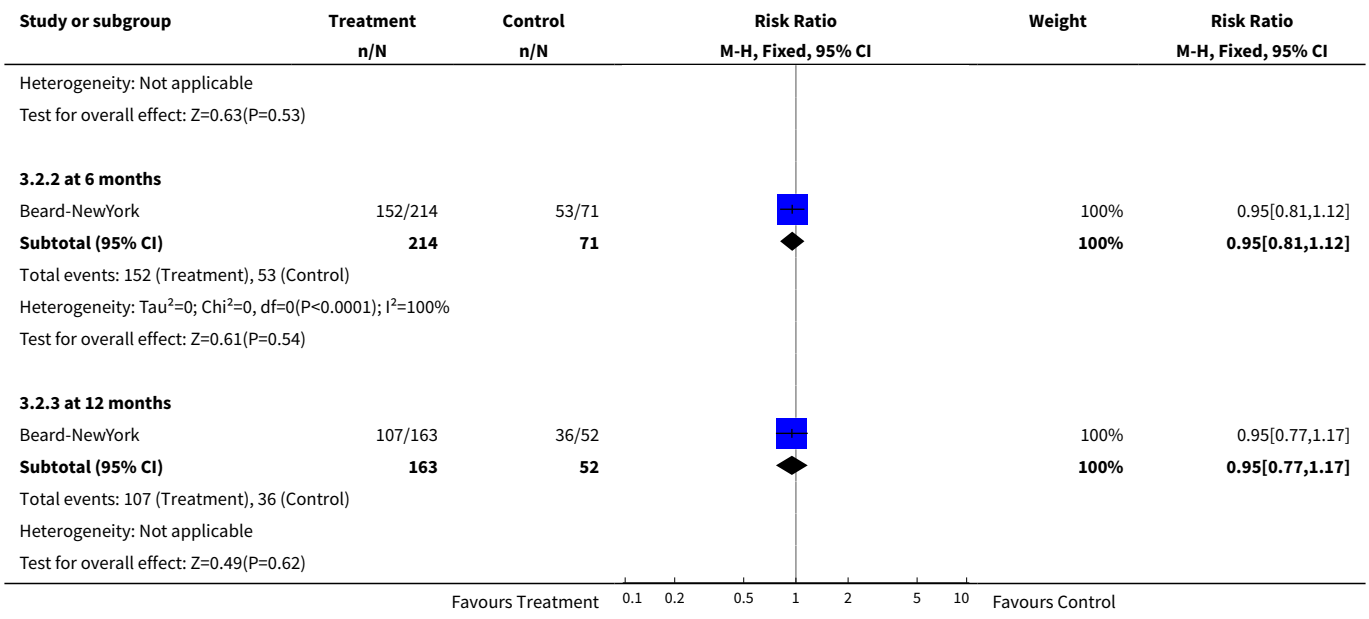
Outcome or subgroup title	No. of studies	No. of partici-pants	Statistical method	Effect size
1 Not in competitive employment (at 24 months)	1	215	Risk Ratio (M-H, Fixed, 95% CI)	0.95 [0.77, 1.17]
2 Not in any form of employment	1		Risk Ratio (M-H, Fixed, 95% CI)	Subtotals only
2.1 at 3 months	1	352	Risk Ratio (M-H, Fixed, 95% CI)	1.05 [0.89, 1.24]
2.2 at 6 months	1	285	Risk Ratio (M-H, Fixed, 95% CI)	0.95 [0.81, 1.12]
2.3 at 12 months	1	215	Risk Ratio (M-H, Fixed, 95% CI)	0.95 [0.77, 1.17]
3 Admitted to hospital in first year of study	1	215	Risk Ratio (M-H, Fixed, 95% CI)	0.69 [0.49, 0.96]

Analysis 3.1. Comparison 3 SUB-ANALYSIS 1: CLUBHOUSE APPROACH (TYPE OF PVT) versus STANDARD COMMUNITY CARE, Outcome 1 Not in competitive employment (at 24 months).

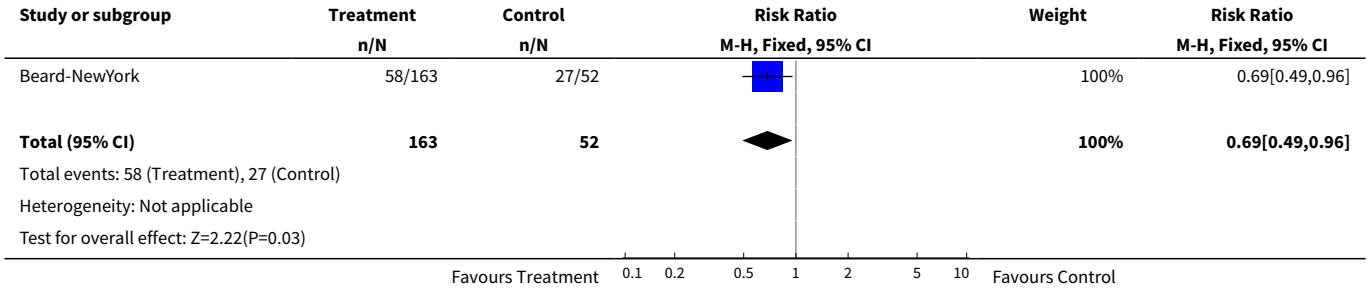


Analysis 3.2. Comparison 3 SUB-ANALYSIS 1: CLUBHOUSE APPROACH (TYPE OF PVT) versus STANDARD COMMUNITY CARE, Outcome 2 Not in any form of employment.





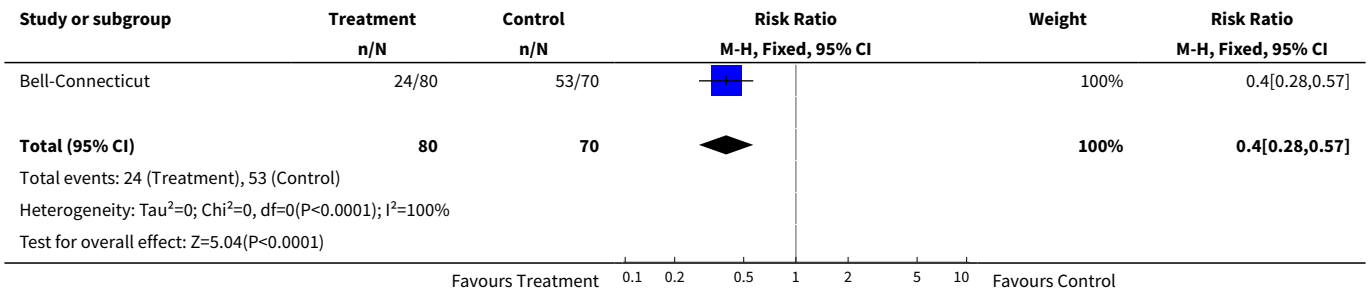
Analysis 3.3. Comparison 3 SUB-ANALYSIS 1: CLUBHOUSE APPROACH (TYPE OF PVT) versus STANDARD COMMUNITY CARE, Outcome 3 Admitted to hospital in first year of study.



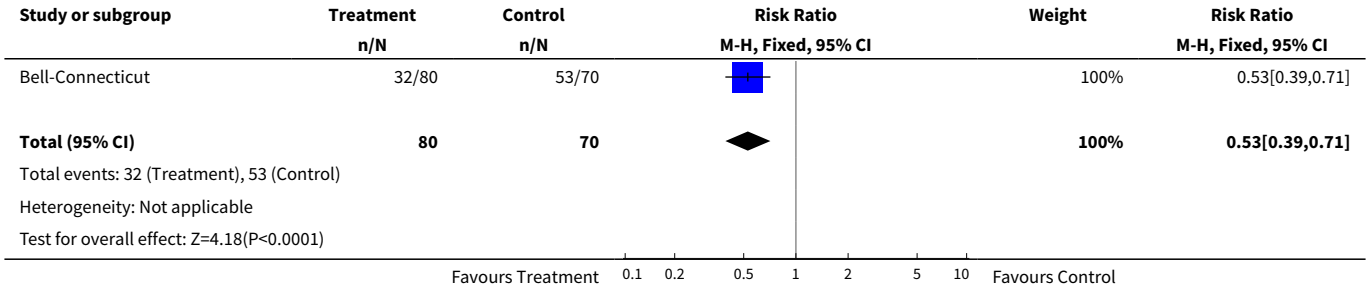
Comparison 4. MODIFICATION 1. PRE-VOCATIONAL TRAINING + PAYMENT versus PRE-VOCATIONAL TRAINING ALONE

Outcome or subgroup title	No. of studies	No. of partici-pants	Statistical method	Effect size
1 Not in any form of employment (at 6 months)	1	150	Risk Ratio (M-H, Fixed, 95% CI)	0.40 [0.28, 0.57]
2 Not participating in program	1	150	Risk Ratio (M-H, Fixed, 95% CI)	0.53 [0.39, 0.71]
3 Admitted to hospital during first year of study	1	150	Risk Ratio (M-H, Fixed, 95% CI)	0.55 [0.31, 0.96]

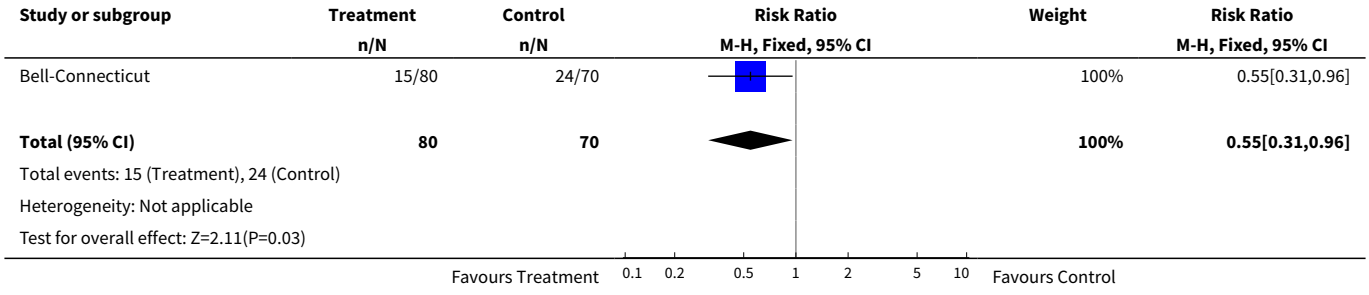
Analysis 4.1. Comparison 4 MODIFICATION 1. PRE-VOCATIONAL TRAINING + PAYMENT versus PRE-VOCATIONAL TRAINING ALONE, Outcome 1 Not in any form of employment (at 6 months).



Analysis 4.2. Comparison 4 MODIFICATION 1. PRE-VOCATIONAL TRAINING + PAYMENT versus PRE-VOCATIONAL TRAINING ALONE, Outcome 2 Not participating in program.



Analysis 4.3. Comparison 4 MODIFICATION 1. PRE-VOCATIONAL TRAINING + PAYMENT versus PRE-VOCATIONAL TRAINING ALONE, Outcome 3 Admitted to hospital during first year of study.



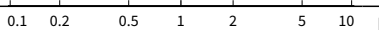
Comparison 5. MODIFICATION 2. PRE-VOCATIONAL TRAINING + PSYCHOLOGICAL INTERVENTIONS versus PRE-VOCATIONAL TRAINING ALONE

Outcome or subgroup title	No. of studies	No. of partici-pants	Statistical method	Effect size
1 Not in competitive employment	2	142	Risk Ratio (M-H, Fixed, 95% CI)	0.86 [0.77, 0.95]

Outcome or subgroup title	No. of studies	No. of participants	Statistical method	Effect size
1.1 at 6 months	1	20	Risk Ratio (M-H, Fixed, 95% CI)	0.56 [0.29, 1.07]
1.2 at 9 months	1	122	Risk Ratio (M-H, Fixed, 95% CI)	0.90 [0.83, 0.99]
2 Not in any form of employment	1	122	Risk Ratio (M-H, Fixed, 95% CI)	0.89 [0.81, 0.97]
3 Not in any form or employment or training or education at end of study	1	122	Risk Ratio (M-H, Fixed, 95% CI)	0.63 [0.52, 0.77]
4 Not participating in program	2	142	Risk Ratio (M-H, Fixed, 95% CI)	0.85 [0.33, 2.18]

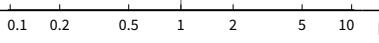
Analysis 5.1. Comparison 5 MODIFICATION 2. PRE-VOCATIONAL TRAINING + PSYCHOLOGICAL INTERVENTIONS versus PRE-VOCATIONAL TRAINING ALONE, Outcome 1 Not in competitive employment.

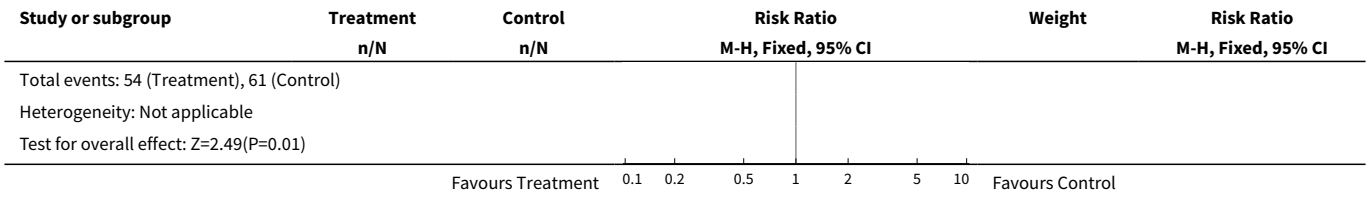
Study or subgroup	Treatment n/N	Control n/N	Risk Ratio M-H, Fixed, 95% CI	Weight	Risk Ratio M-H, Fixed, 95% CI
5.1.1 at 6 months					
Kline-Philadelphia	5/10	9/10		12.77%	0.56[0.29,1.07]
Subtotal (95% CI)	**10**	**10**		**12.77%**	**0.56[0.29,1.07]**
Total events: 5 (Treatment), 9 (Control)					
Heterogeneity: Not applicable					
Test for overall effect: Z=1.76(P=0.08)					
5.1.2 at 9 months					
Blankertz-Philadelph	55/61	61/61		87.23%	0.9[0.83,0.99]
Subtotal (95% CI)	**61**	**61**		**87.23%**	**0.9[0.83,0.99]**
Total events: 55 (Treatment), 61 (Control)					
Heterogeneity: Not applicable					
Test for overall effect: Z=2.28(P=0.02)					
Total (95% CI)	**71**	**71**		**100%**	**0.86[0.77,0.95]**
Total events: 60 (Treatment), 70 (Control)					
Heterogeneity: Tau^2=0; Chi^2=2.95, df=1(P=0.09); I^2=66.16%					
Test for overall effect: Z=2.9(P=0)					
Test for subgroup differences: Not applicable					



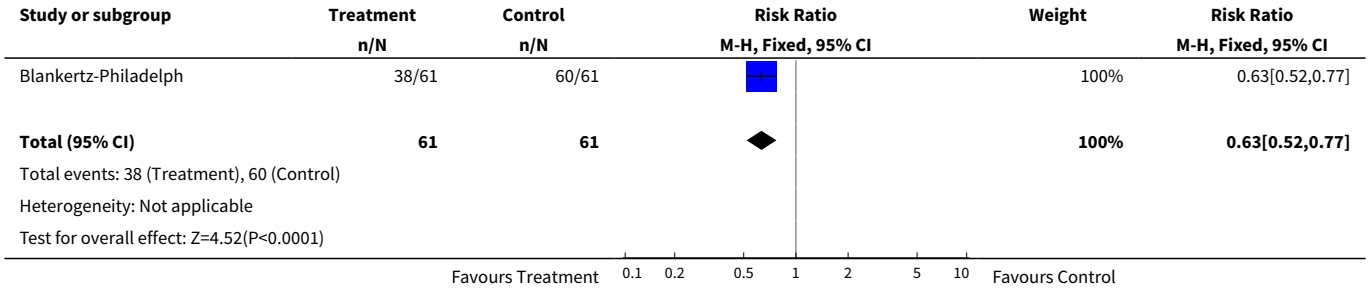
Analysis 5.2. Comparison 5 MODIFICATION 2. PRE-VOCATIONAL TRAINING + PSYCHOLOGICAL INTERVENTIONS versus PRE-VOCATIONAL TRAINING ALONE, Outcome 2 Not in any form of employment.

Study or subgroup	Treatment n/N	Control n/N	Risk Ratio M-H, Fixed, 95% CI	Weight	Risk Ratio M-H, Fixed, 95% CI
Blankertz-Philadelph	54/61	61/61		100%	0.89[0.81,0.97]
Total (95% CI)	**61**	**61**		**100%**	**0.89[0.81,0.97]**

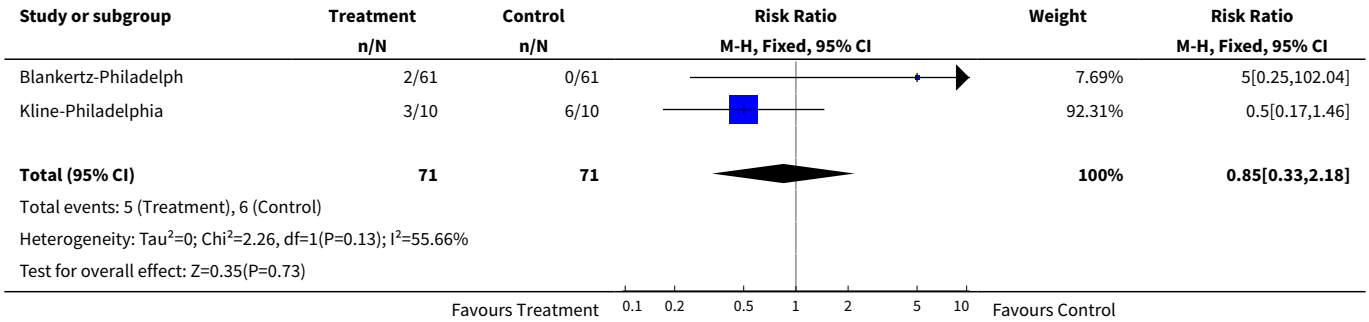




Analysis 5.3. Comparison 5 MODIFICATION 2. PRE-VOCATIONAL TRAINING + PSYCHOLOGICAL INTERVENTIONS versus PRE-VOCATIONAL TRAINING ALONE, Outcome 3 Not in any form or employment or training or education at end of study.



Analysis 5.4. Comparison 5 MODIFICATION 2. PRE-VOCATIONAL TRAINING + PSYCHOLOGICAL INTERVENTIONS versus PRE-VOCATIONAL TRAINING ALONE, Outcome 4 Not participating in program.



Comparison 6. MODIFICATION 3. ACCELERATED ENTRY TO TRANSITIONAL EMPLOYMENT (TE - TYPE OF PVT) versus GRADUAL ENTRY TO TE

Outcome or subgroup title	No. of studies	No. of partici-pants	Statistical method	Effect size
1 Not in competitive employment	1		Risk Ratio (M-H, Fixed, 95% CI)	Subtotals only
1.1 at 9 months	1	131	Risk Ratio (M-H, Fixed, 95% CI)	1.00 [0.90, 1.10]
1.2 at 15 months	1	131	Risk Ratio (M-H, Fixed, 95% CI)	0.88 [0.78, 1.00]

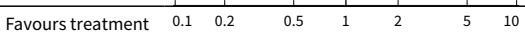
Outcome or subgroup title	No. of studies	No. of partici-pants	Statistical method	Effect size
2 Not in any form of employment (at 15 months)	1	131	Risk Ratio (M-H, Fixed, 95% CI)	0.96 [0.69, 1.33]
3 Numbers not participating in program	1		Risk Ratio (M-H, Fixed, 95% CI)	Subtotals only
3.1 at 4 months	1	131	Risk Ratio (M-H, Fixed, 95% CI)	1.77 [0.98, 3.21]
3.2 at 9 months	1	131	Risk Ratio (M-H, Fixed, 95% CI)	1.20 [0.74, 1.92]
4 Number readmitted to hospital (at about 15 months)	1	131	Risk Ratio (M-H, Fixed, 95% CI)	1.05 [0.68, 1.62]

Analysis 6.1. Comparison 6 MODIFICATION 3. ACCELERATED ENTRY TO TRANSITIONAL EMPLOYMENT (TE - TYPE OF PVT) versus GRADUAL ENTRY TO TE, Outcome 1 Not in competitive employment.

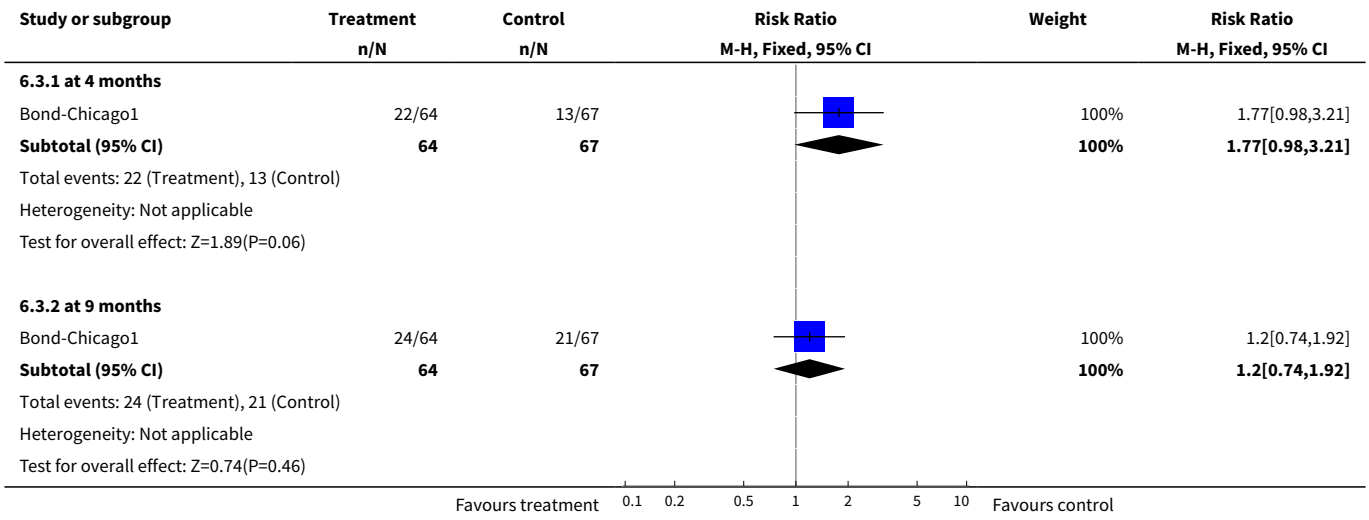
Study or subgroup	Treatment n/N	Control n/N	Risk Ratio M-H, Fixed, 95% CI	Weight	Risk Ratio M-H, Fixed, 95% CI
6.1.1 at 9 months					
Bond-Chicago1	59/64	62/67		100%	1[0.9,1.1]
Subtotal (95% CI)	**64**	**67**		**100%**	**1[0.9,1.1]**
Total events: 59 (Treatment), 62 (Control)					
Heterogeneity: Not applicable					
Test for overall effect: Z=0.08(P=0.94)					
6.1.2 at 15 months					
Bond-Chicago1	53/64	63/67		100%	0.88[0.78,1]
Subtotal (95% CI)	**64**	**67**		**100%**	**0.88[0.78,1]**
Total events: 53 (Treatment), 63 (Control)					
Heterogeneity: Not applicable					
Test for overall effect: Z=1.96(P=0.05)					

Analysis 6.2. Comparison 6 MODIFICATION 3. ACCELERATED ENTRY TO TRANSITIONAL EMPLOYMENT (TE - TYPE OF PVT) versus GRADUAL ENTRY TO TE, Outcome 2 Not in any form of employment (at 15 months).

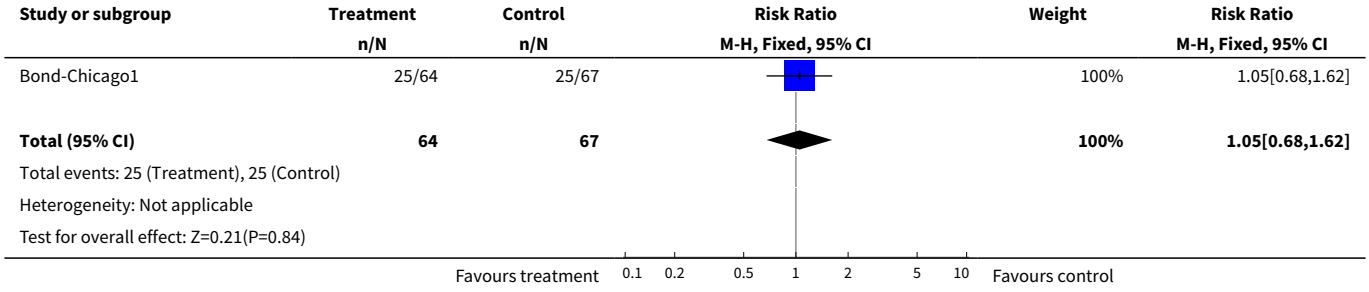
Study or subgroup	Treatment n/N	Control n/N	Risk Ratio M-H, Fixed, 95% CI	Weight	Risk Ratio M-H, Fixed, 95% CI
Bond-Chicago1	33/64	36/67		100%	0.96[0.69,1.33]
Total (95% CI)	**64**	**67**		**100%**	**0.96[0.69,1.33]**
Total events: 33 (Treatment), 36 (Control)					
Heterogeneity: Tau^2=0; Chi^2=0, df=0(P<0.0001); I^2=100%					
Test for overall effect: Z=0.25(P=0.8)					



Analysis 6.3. Comparison 6 MODIFICATION 3. ACCELERATED ENTRY TO TRANSITIONAL EMPLOYMENT (TE - TYPE OF PVT) versus GRADUAL ENTRY TO TE, Outcome 3 Numbers not participating in program.



Analysis 6.4. Comparison 6 MODIFICATION 3. ACCELERATED ENTRY TO TRANSITIONAL EMPLOYMENT (TE - TYPE OF PVT) versus GRADUAL ENTRY TO TE, Outcome 4 Number readmitted to hospital (at about 15 months).



Comparison 7. SUPPORTED EMPLOYMENT versus STANDARD COMMUNITY CARE

Outcome or subgroup title	No. of studies	No. of participants	Statistical method	Effect size
1 Not in competitive employment	1		Risk Ratio (M-H, Fixed, 95% CI)	Subtotals only
1.3 at 12 months	1	256	Risk Ratio (M-H, Fixed, 95% CI)	1.01 [0.93, 1.09]
1.5 at 24 months	1	256	Risk Ratio (M-H, Fixed, 95% CI)	0.92 [0.85, 0.99]
1.6 at 36 months	1	256	Risk Ratio (M-H, Fixed, 95% CI)	0.88 [0.82, 0.96]
2 Not in any form of employment	1		Risk Ratio (M-H, Fixed, 95% CI)	Subtotals only
3 Numbers not participating in program	1	256	Risk Ratio (M-H, Fixed, 95% CI)	0.74 [0.55, 1.01]

Outcome or subgroup title	No. of studies	No. of participants	Statistical method	Effect size
4 Numbers admitted to hospital during study	1	256	Risk Ratio (M-H, Fixed, 95% CI)	0.83 [0.63, 1.10]

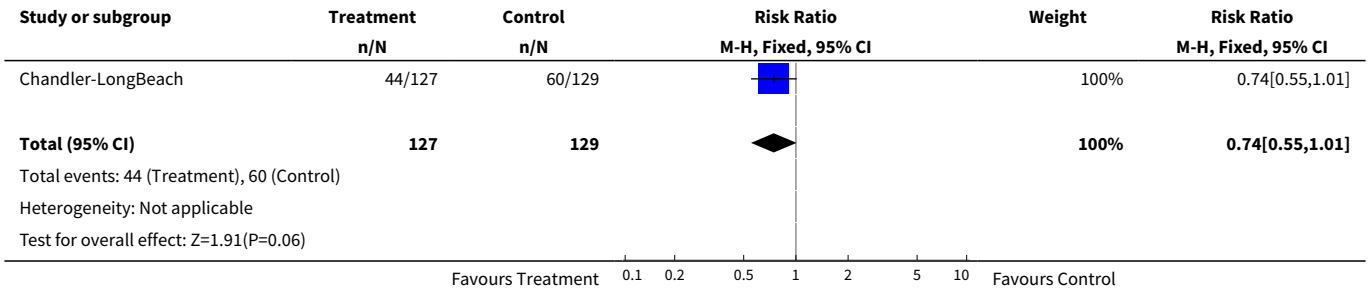
Analysis 7.1. Comparison 7 SUPPORTED EMPLOYMENT versus STANDARD COMMUNITY CARE, Outcome 1 Not in competitive employment.

Study or subgroup	Treatment n/N	Control n/N	Risk Ratio M-H, Fixed, 95% CI	Weight	Risk Ratio M-H, Fixed, 95% CI
7.1.3 at 12 months					
Chandler-LongBeach	115/127	116/129		100%	1.01[0.93,1.09]
Subtotal (95% CI)	**127**	**129**		**100%**	**1.01[0.93,1.09]**
Total events: 115 (Treatment), 116 (Control)					
Heterogeneity: Not applicable					
Test for overall effect: Z=0.17(P=0.87)					
7.1.5 at 24 months					
Chandler-LongBeach	111/127	123/129		100%	0.92[0.85,0.99]
Subtotal (95% CI)	**127**	**129**		**100%**	**0.92[0.85,0.99]**
Total events: 111 (Treatment), 123 (Control)					
Heterogeneity: Not applicable					
Test for overall effect: Z=2.24(P=0.03)					
7.1.6 at 36 months					
Chandler-LongBeach	108/127	124/129		100%	0.88[0.82,0.96]
Subtotal (95% CI)	**127**	**129**		**100%**	**0.88[0.82,0.96]**
Total events: 108 (Treatment), 124 (Control)					
Heterogeneity: Not applicable					
Test for overall effect: Z=2.97(P=0)					

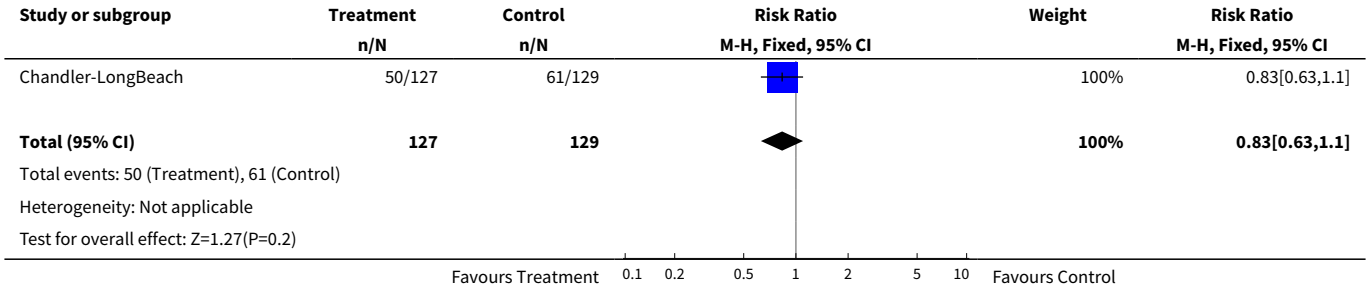
Analysis 7.2. Comparison 7 SUPPORTED EMPLOYMENT versus STANDARD COMMUNITY CARE, Outcome 2 Not in any form of employment.

Study or subgroup	Treatment n/N	Control n/N	Risk Ratio M-H, Fixed, 95% CI	Weight	Risk Ratio M-H, Fixed, 95% CI
Chandler-LongBeach	90/127	115/129		0%	0.79[0.7,0.9]

Analysis 7.3. Comparison 7 SUPPORTED EMPLOYMENT versus STANDARD COMMUNITY CARE, Outcome 3 Numbers not participating in program.



Analysis 7.4. Comparison 7 SUPPORTED EMPLOYMENT versus STANDARD COMMUNITY CARE, Outcome 4 Numbers admitted to hospital during study.



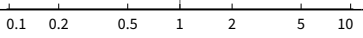
Comparison 8. SUPPORTED EMPLOYMENT (ALL APPROACHES) versus PRE-VOCATIONAL TRAINING

Outcome or subgroup title	No. of studies	No. of participants	Statistical method	Effect size
1 Not in competitive employment	5		Risk Ratio (M-H, Fixed, 95% CI)	Subtotals only
1.1 at about 4 months	3	364	Risk Ratio (M-H, Fixed, 95% CI)	0.73 [0.66, 0.81]
1.2 at 6 months	3	364	Risk Ratio (M-H, Fixed, 95% CI)	0.74 [0.67, 0.82]
1.3 at 9 months	3	364	Risk Ratio (M-H, Fixed, 95% CI)	0.67 [0.60, 0.76]
1.4 at 12 months	5	484	Risk Ratio (M-H, Fixed, 95% CI)	0.76 [0.69, 0.84]
1.5 at 15 months	3	364	Risk Ratio (M-H, Fixed, 95% CI)	0.82 [0.73, 0.91]
1.6 at 18 months	3	364	Risk Ratio (M-H, Fixed, 95% CI)	0.78 [0.71, 0.87]
1.7 at 24 months	2	155	Risk Ratio (M-H, Fixed, 95% CI)	0.90 [0.81, 1.00]
2 Not in any form of employment	1		Risk Ratio (M-H, Fixed, 95% CI)	Subtotals only

Outcome or subgroup title	No. of studies	No. of partici-pants	Statistical method	Effect size
2.1 at 6 months	1	69	Risk Ratio (M-H, Fixed, 95% CI)	1.05 [0.62, 1.78]
2.2 at 9 months	1	69	Risk Ratio (M-H, Fixed, 95% CI)	0.61 [0.35, 1.08]
2.3 at 12 months	1	69	Risk Ratio (M-H, Fixed, 95% CI)	0.67 [0.40, 1.12]
2.4 at 15 months	1	69	Risk Ratio (M-H, Fixed, 95% CI)	0.93 [0.53, 1.61]
2.5 at 18 months	1	69	Risk Ratio (M-H, Fixed, 95% CI)	0.81 [0.50, 1.33]
3 Numbers not participating in program	4		Risk Ratio (M-H, Fixed, 95% CI)	Subtotals only
3.1 at 6 months	1	86	Risk Ratio (M-H, Fixed, 95% CI)	0.95 [0.58, 1.54]
3.2 at 12 months	2	295	Risk Ratio (M-H, Fixed, 95% CI)	0.67 [0.48, 0.96]
3.3 at 18 months	1	69	Risk Ratio (M-H, Fixed, 95% CI)	0.37 [0.10, 1.32]

Analysis 8.1. Comparison 8 SUPPORTED EMPLOYMENT (ALL APPROACHES) versus PRE-VOCATIONAL TRAINING, Outcome 1 Not in competitive employment.

Study or subgroup	Treatment n/N	Control n/N	Risk Ratio M-H, Fixed, 95% CI	Weight	Risk Ratio M-H, Fixed, 95% CI
8.1.1 at about 4 months					
Drake-New Hampshire1	45/74	65/69		39.04%	0.65[0.53,0.78]
Drake-Washington	56/76	75/76		43.53%	0.75[0.65,0.86]
McFarlane-New York	29/37	28/32		17.43%	0.9[0.72,1.11]
Subtotal (95% CI)	**187**	**177**		**100%**	**0.73[0.66,0.81]**
Total events: 130 (Treatment), 168 (Control)					
Heterogeneity: Tau^2=0; Chi^2=5.12, df=2(P=0.08); I^2=60.95%					
Test for overall effect: Z=6.01(P<0.0001)					
8.1.2 at 6 months					
Drake-New Hampshire1	46/74	61/69		37.07%	0.7[0.58,0.86]
Drake-Washington	54/76	75/76		44.04%	0.72[0.62,0.83]
McFarlane-New York	30/37	30/32		18.89%	0.86[0.72,1.03]
Subtotal (95% CI)	**187**	**177**		**100%**	**0.74[0.67,0.82]**
Total events: 130 (Treatment), 166 (Control)					
Heterogeneity: Tau^2=0; Chi^2=3.27, df=2(P=0.2); I^2=38.77%					
Test for overall effect: Z=5.75(P<0.0001)					
8.1.3 at 9 months					
Drake-New Hampshire1	39/74	59/69		36.2%	0.62[0.49,0.78]
Drake-Washington	52/76	76/76		45.36%	0.69[0.59,0.8]
McFarlane-New York	25/37	29/32		18.44%	0.75[0.58,0.96]
Subtotal (95% CI)	**187**	**177**		**100%**	**0.67[0.6,0.76]**
Total events: 116 (Treatment), 164 (Control)					



Favours Treatment — Favours Control

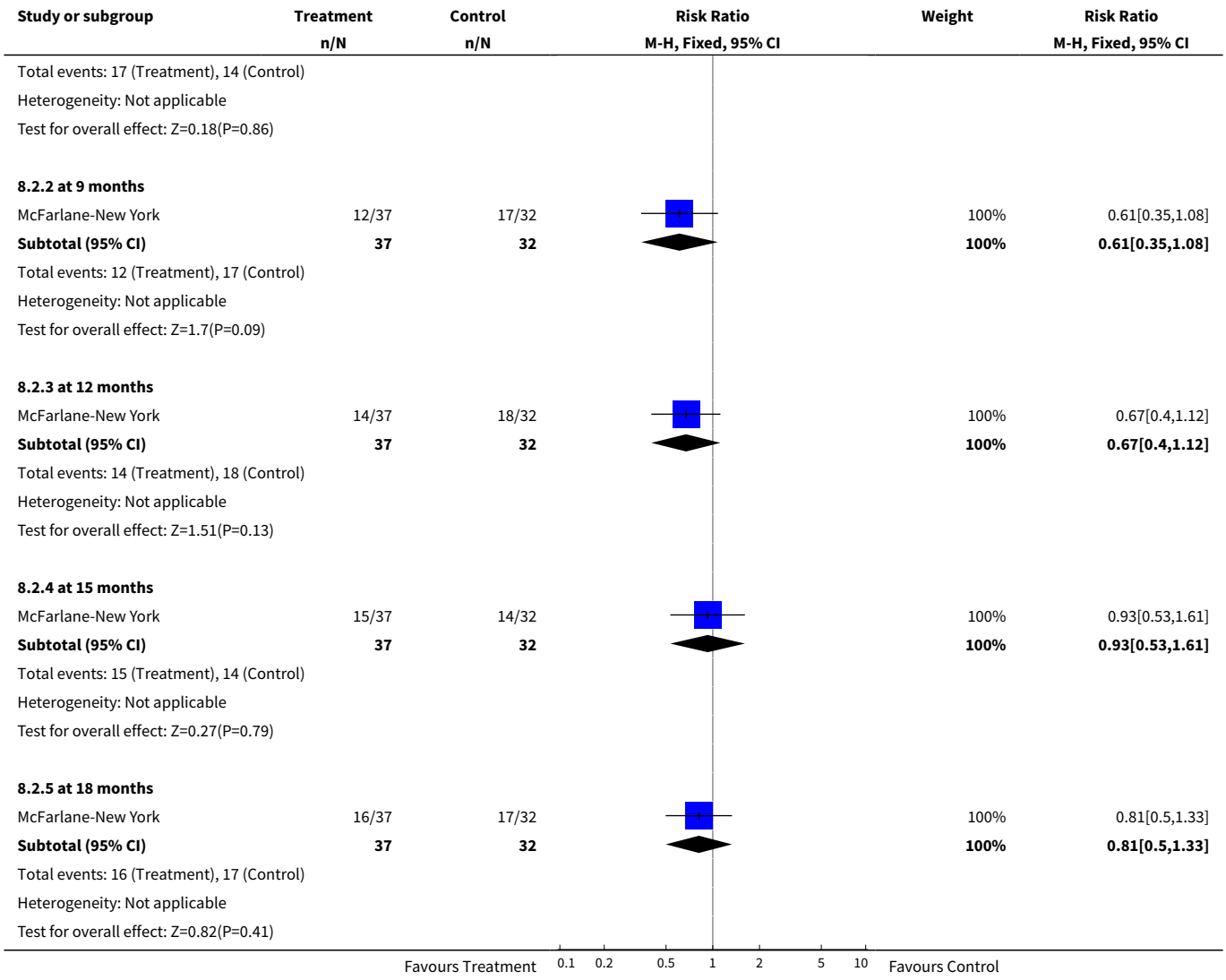
Study or subgroup	Treatment n/N	Control n/N	Risk Ratio M-H, Fixed, 95% CI	Weight	Risk Ratio M-H, Fixed, 95% CI
Heterogeneity: Tau²=0; Chi²=1.25, df=2(P=0.53); I²=0%					
Test for overall effect: Z=6.58(P<0.0001)					
8.1.4 at 12 months					
Bond-Indiana	33/43	37/43		17.54%	0.89[0.73,1.09]
Drake-New Hampshire1	47/74	53/69		26%	0.83[0.67,1.03]
Drake-Washington	56/76	74/76		35.08%	0.76[0.66,0.87]
Gervey-New York	6/22	10/12		6.13%	0.33[0.16,0.68]
McFarlane-New York	23/37	30/32		15.25%	0.66[0.51,0.87]
Subtotal (95% CI)	**252**	**232**		**100%**	**0.76[0.69,0.84]**
Total events: 165 (Treatment), 204 (Control)					
Heterogeneity: Tau²=0; Chi²=9.15, df=4(P=0.06); I²=56.29%					
Test for overall effect: Z=5.53(P<0.0001)					
8.1.5 at 15 months					
Drake-New Hampshire1	48/74	53/69		34.52%	0.84[0.68,1.04]
Drake-Washington	60/76	74/76		46.58%	0.81[0.72,0.92]
McFarlane-New York	25/37	28/32		18.9%	0.77[0.6,1]
Subtotal (95% CI)	**187**	**177**		**100%**	**0.82[0.73,0.91]**
Total events: 133 (Treatment), 155 (Control)					
Heterogeneity: Tau²=0; Chi²=0.28, df=2(P=0.87); I²=0%					
Test for overall effect: Z=3.82(P=0)					
8.1.6 at 18 months					
Drake-New Hampshire1	46/74	55/69		35.33%	0.78[0.63,0.97]
Drake-Washington	57/76	72/76		44.69%	0.79[0.69,0.91]
McFarlane-New York	27/37	30/32		19.97%	0.78[0.63,0.97]
Subtotal (95% CI)	**187**	**177**		**100%**	**0.78[0.71,0.87]**
Total events: 130 (Treatment), 157 (Control)					
Heterogeneity: Tau²=0; Chi²=0.02, df=2(P=0.99); I²=0%					
Test for overall effect: Z=4.43(P<0.0001)					
8.1.7 at 24 months					
Bond-Indiana	37/43	40/43		54.61%	0.93[0.8,1.07]
McFarlane-New York	31/37	31/32		45.39%	0.86[0.74,1.01]
Subtotal (95% CI)	**80**	**75**		**100%**	**0.9[0.81,1]**
Total events: 68 (Treatment), 71 (Control)					
Heterogeneity: Tau²=0; Chi²=0.39, df=1(P=0.53); I²=0%					
Test for overall effect: Z=1.99(P=0.05)					

Favours Treatment 0.1 0.2 0.5 1 2 5 10 Favours Control

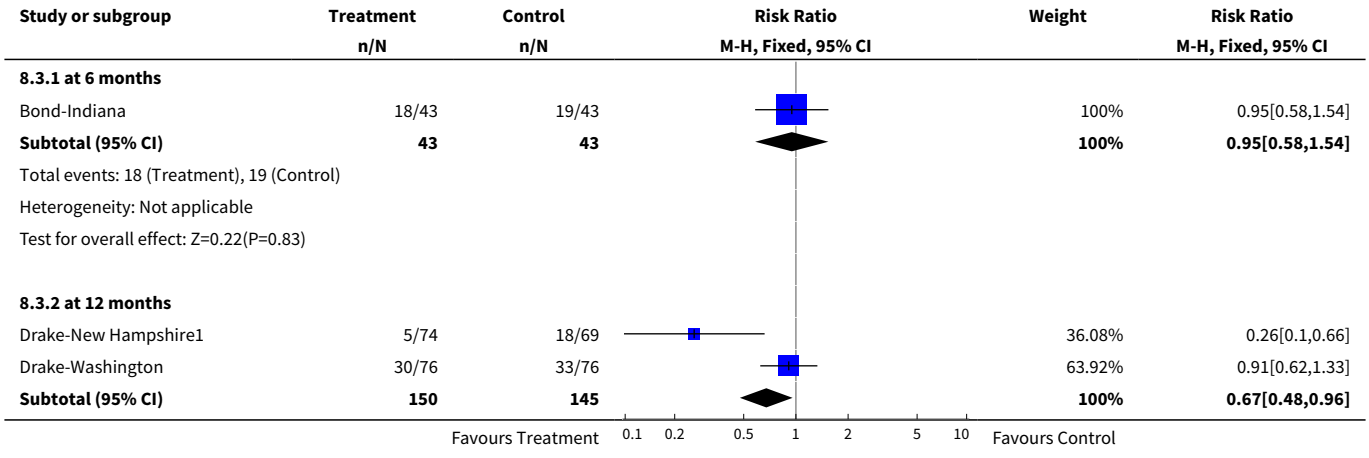
Analysis 8.2. Comparison 8 SUPPORTED EMPLOYMENT (ALL APPROACHES) versus PRE-VOCATIONAL TRAINING, Outcome 2 Not in any form of employment.

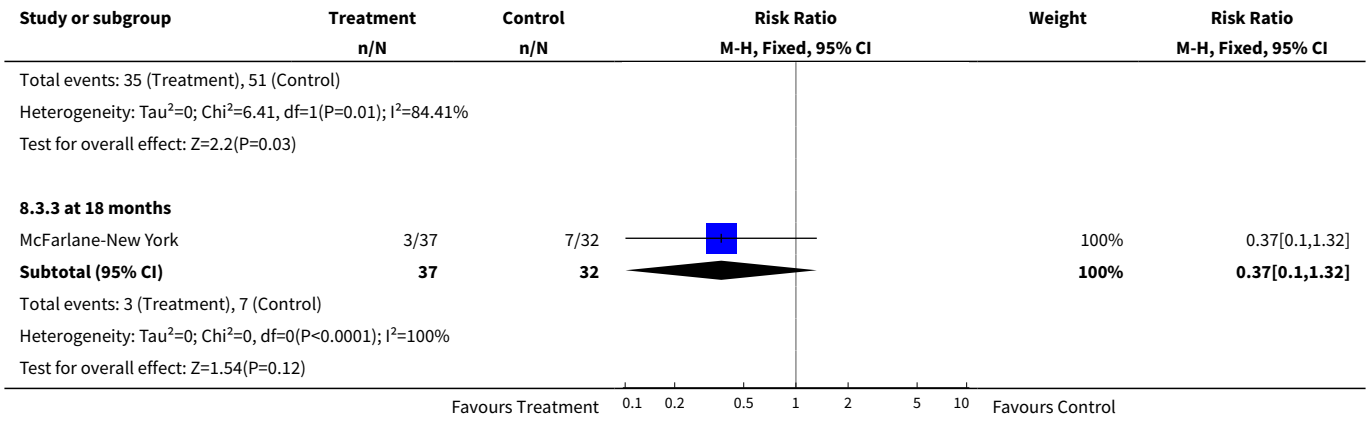
Study or subgroup	Treatment n/N	Control n/N	Risk Ratio M-H, Fixed, 95% CI	Weight	Risk Ratio M-H, Fixed, 95% CI
8.2.1 at 6 months					
McFarlane-New York	17/37	14/32		100%	1.05[0.62,1.78]
Subtotal (95% CI)	**37**	**32**		**100%**	**1.05[0.62,1.78]**

Favours Treatment 0.1 0.2 0.5 1 2 5 10 Favours Control



Analysis 8.3. Comparison 8 SUPPORTED EMPLOYMENT (ALL APPROACHES) versus PRE-VOCATIONAL TRAINING, Outcome 3 Numbers not participating in program.

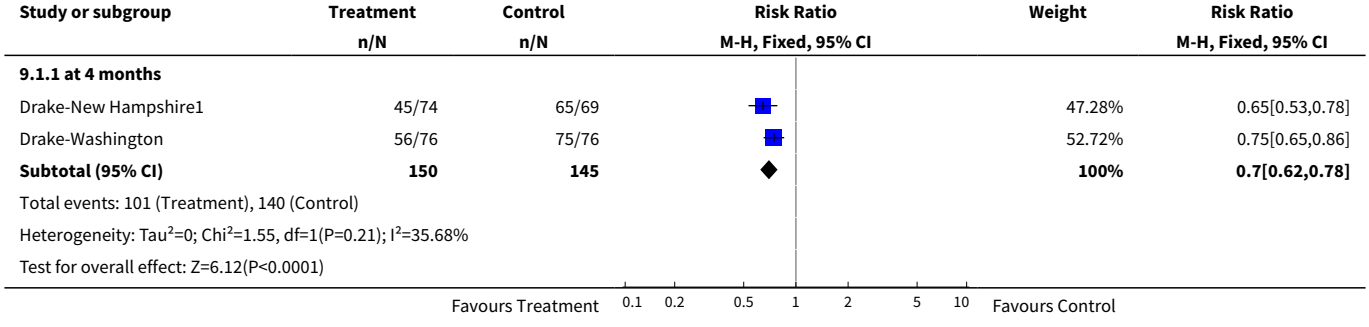


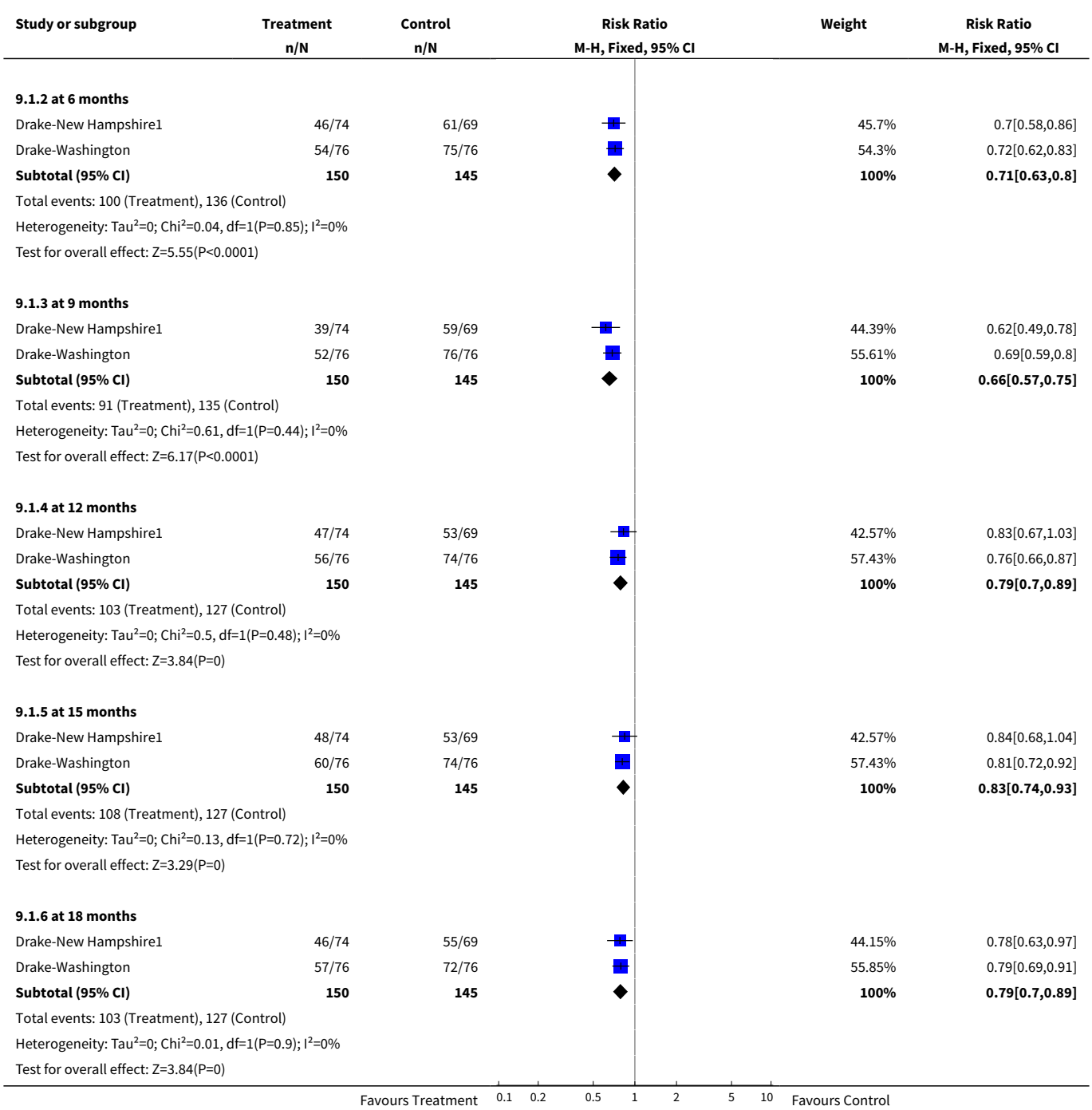


Comparison 9. SUB-ANALYSIS 2: INDIVIDUAL PLACEMENT & SUPPORT (TYPE OF SUPPORTED EMPLOYMENT) versus PRE-VOCATIONAL TRAINING

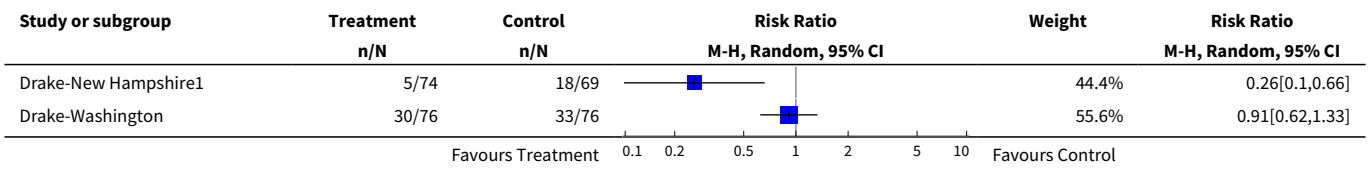
Outcome or subgroup title	No. of studies	No. of participants	Statistical method	Effect size
1 Not in competitive employment	2		Risk Ratio (M-H, Fixed, 95% CI)	Subtotals only
1.1 at 4 months	2	295	Risk Ratio (M-H, Fixed, 95% CI)	0.70 [0.62, 0.78]
1.2 at 6 months	2	295	Risk Ratio (M-H, Fixed, 95% CI)	0.71 [0.63, 0.80]
1.3 at 9 months	2	295	Risk Ratio (M-H, Fixed, 95% CI)	0.66 [0.57, 0.75]
1.4 at 12 months	2	295	Risk Ratio (M-H, Fixed, 95% CI)	0.79 [0.70, 0.89]
1.5 at 15 months	2	295	Risk Ratio (M-H, Fixed, 95% CI)	0.83 [0.74, 0.93]
1.6 at 18 months	2	295	Risk Ratio (M-H, Fixed, 95% CI)	0.79 [0.70, 0.89]
2 Numbers not participating in program	2	295	Risk Ratio (M-H, Random, 95% CI)	0.52 [0.15, 1.85]

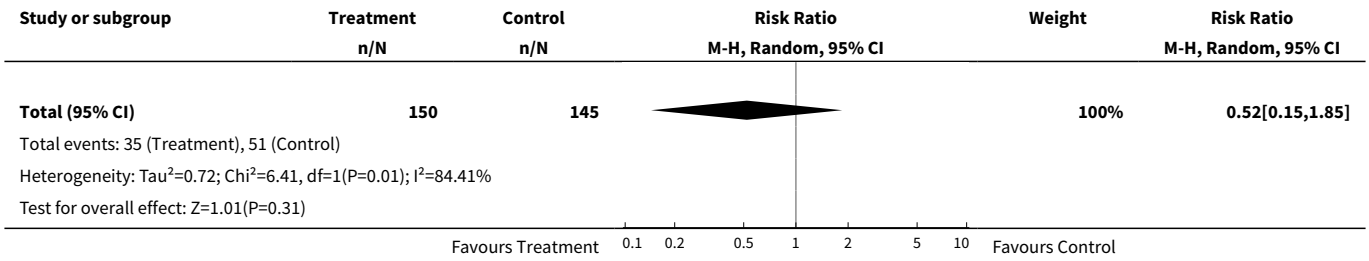
Analysis 9.1. Comparison 9 SUB-ANALYSIS 2: INDIVIDUAL PLACEMENT & SUPPORT (TYPE OF SUPPORTED EMPLOYMENT) versus PRE-VOCATIONAL TRAINING, Outcome 1 Not in competitive employment.





Analysis 9.2. Comparison 9 SUB-ANALYSIS 2: INDIVIDUAL PLACEMENT & SUPPORT (TYPE OF SUPPORTED EMPLOYMENT) versus PRE-VOCATIONAL TRAINING, Outcome 2 Numbers not participating in program.





ADDITIONAL TABLES

Table 1. Supported Employment versus PVT: Mean hours in competitive employment

Study	Intervention	Mean monthly hrs	t (or F)	p
Drake-NH	IP	33.7	3.7	<0.001
	PVT	11.4		
Drake-Wash	IP	17.9	4.4	<0.001
	PVT	1.5		
Gervey	IP	69	3.7	0.03
	PVT	9.9		

Table 2. Supported Employment versus PVT: Mean monthly earnings ($)

Study	Intervention	Mean earnings	t or F	p
Bond-Indiana	SE	127.1	2.55	<0.05
	PVT	71.7		
McFarlane-New York	SE	41.9	2.35	0.019
	PVT	11.8		
Drake-NH1	SE	188.5	3.34	<0.001
	PVT	59.9		
Drake-Wash	SE	111.1	4.29	NS
	PVT	111.4		

Table 3. Supported Employment versus PVT: Costs of care (mean monthly per patient)

Study	Group	Program costs	Other health costs	Overall costs
Bond-Indiana	Immediate Placement	$251.6	$263.0	$514.6
	Control	$132.0	$586.5	$718.5
Drake-NH1	Immediate Placement	$313.1	$801.6	$1114.7
	Control	$307.3	$928.5	$1235.8

WHAT'S NEW

Date	Event	Description
6 October 2010	Amended	Contact details updated.

HISTORY

Protocol first published: Issue 3, 1999
Review first published: Issue 2, 2001

Date	Event	Description
11 November 2009	Amended	Contact details updated.
20 July 2009	Amended	Author correction
23 April 2008	Amended	Converted to new review format.
7 December 2000	New citation required and conclusions have changed	Substantive amendment

CONTRIBUTIONS OF AUTHORS

Ruth Crowther - designed the protocol, co-ordinated the reviewing, developed and ran the search strategy, screened the results, organised the retrieval of papers, appraised papers and extracted data. She entered, analysed and interpreted the data and participated in writing the review.

Max Marshall - conceived the review and obtained funding. He designed the protocol, developed the search strategy, screened search results, appraised papers, extracted, analysed and interpreted data and participated in writing the review.

Peter Huxley - conceived the review and obtained funding. He helped interpret data and provided a methodological, policy and clinical perspective on the data and participated in writing the review.

Gary Bond - assisted in developing the search strategy, provided additional information about papers and helped in obtaining data on unpublished studies. He helped analyse and interpret data and was involved in writing the review. Gary Bond has performed previous reviews in the field that were the foundation of the current study.

DECLARATIONS OF INTEREST

Ruth Crowther, Max Marshall and Peter Huxley have no conflict of interest. Gary Bond has collaborated with Robert Drake and Debbie Becker (developers of the Individual Placement and Support Model), and their colleagues at Dartmouth on a series of studies and papers related to this model. He is co-author on one IPS trial (Drake-Washington) and is currently funded to complete a 5-year randomised controlled trial comparing IPS to a Pre-vocational Training model. Bond is also the primary author on two other trials reviewed in this group: Bond-Chicago1 and Bond-Indiana.

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Internal sources

- Guild Community Healthcare Trust, UK.

External sources

- NHS Health Technology Assessment - grant no. 96/41/3, UK.
- NHS Executive North West (research fellowship for Ms. Crowther), UK.

NOTES

The views expressed in this paper are not necessarily those of the NHS Health Technology Assessment Programme.

Cochrane Schizophrenia Group internal peer review complete (see Module).
External peer review scheduled.

INDEX TERMS

Medical Subject Headings (MeSH)

*Rehabilitation, Vocational; Employment; Mental Disorders [*rehabilitation]; Randomized Controlled Trials as Topic

MeSH check words

Humans