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Supported employment for adults with severe mental illness (Review)

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[Intervention Review]

Supported employment for adults with severe mental illness

Yoshihiro Kinoshita[1], Toshi A Furukawa[2], Kuni Kinoshita[3], Mina Honyashiki[4], Ichiro M Omori[5], Max Marshall[6], Gary R Bond[7], Peter Huxley[8], Naoji Amano[9], David Kingdon[10]

[1]Department of Psychiatry, Shinshu University School of Medicine, Matsumoto, Japan. [2]Departments of Health Promotion and Behavior Change and of Clinical Epidemiology, Kyoto University Graduate School of Medicine / School of Public Health, Kyoto, Japan. [3]Akitsu-kai Nanshin Hospital, Minami-minowa, Japan. [4]Department of Health Promotion and Human Behavior, Kyoto University Graduate School of Medicine / School of Public Health, Kyoto, Japan. [5]Department of Psychiatry, Toyokawa City Hospital, Aichi, Japan. [6]University of Manchester, The Lantern Centre, Preston., UK. [7]Department of Psychiatry, Dartmouth Medical School, Lebanon, New Hampshire, USA. [8]Applied Social Studies, University of Swansea, Swansea, UK. [9]Department of Psychiatry, Shinshu University, School of Medicine, Matsumoto, Japan. [10]Mental Health Group, University of Southampton, Southampton, UK

Contact address: Yoshihiro Kinoshita, Department of Psychiatry, Shinshu University School of Medicine, Matsumoto, Japan. ykino@joy.hi-ho.ne.jp.

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ABSTRACT

Background

People who suffer from severe mental disorder experience high rates of unemployment. Supported employment is an approach to vocational rehabilitation that involves trying to place clients in competitive jobs without any extended preparation. The Individual placement and support (IPS) model is a carefully specified form of supported employment.

Objectives

1. To review the effectiveness of supported employment compared with other approaches to vocational rehabilitation or treatment as usual.

2. Secondary objectives were to establish how far:

(a) fidelity to the IPS model affects the effectiveness of supported employment,

(b) the effectiveness of supported employment can be augmented by the addition of other interventions.

Search methods

We searched the Cochrane Schizophrenia Group Trials Register (February 2010), which is compiled by systematic searches of major databases, handsearches and conference proceedings.

Selection criteria

All relevant randomised clinical trials focusing on people with severe mental illness, of working age (normally 16 to 70 years), where supported employment was compared with other vocational approaches or treatment as usual. Outcomes such as days in employment, job stability, global state, social functioning, mental state, quality of life, satisfaction and costs were sought.

Data collection and analysis

Two review authors (YK and KK) independently extracted data. For binary outcomes, we calculated risk ratio (RR) and its 95% confidence interval (CI), on an intention-to-treat basis. For continuous data, we estimated mean difference (MD) between groups and its 95% (CI). We employed a fixed-effect model for analyses. A random-effects model was also employed where heterogeneity was present.

Main results

A total of 14 randomised controlled trials were included in this review (total 2265 people). In terms of our primary outcome (employment: days in competitive employment, over one year follow-up), supported employment seems to significantly increase levels of any employment obtained during the course of studies (7 RCTs, n = 951, RR 3.24 CI 2.17 to 4.82, *very low quality of evidence*). Supported employment also seems to increase length of competitive employment when compared with other vocational approaches (1 RCT, n = 204, MD 70.63 CI 43.22 to 94.04, *very low quality evidence*). Supported employment also showed some advantages in other secondary outcomes. It appears to increase length (in days) of any form of paid employment (2 RCTs, n = 510, MD 84.94 CI 51.99 to 117.89, *very low quality evidence*) and job tenure (weeks) for competitive employment (1 RCT, n = 204, MD 9.86 CI 5.36 to 14.36, *very low quality evidence*) and any paid employment (3 RCTs, n = 735, MD 3.86 CI -2.94 to 22.17, *very low quality evidence*). Furthermore, one study indicated a decreased time to first competitive employment in the long term for people in supported employment (1 RCT, n = 204, MD -161.60 CI -225.73 to -97.47, *very low quality evidence*). A large amount of data were considerably skewed, and therefore not included in meta-analysis, which makes any meaningful interpretation of the vast amount of data very difficult.

Authors' conclusions

The limited available evidence suggests that supported employment is effective in improving a number of vocational outcomes relevant to people with severe mental illness, though there appears to exist some overall risk of bias in terms of the quality of individual studies. All studies should report a standard set of vocational and non-vocational outcomes that are relevant to the consumers and policy-makers. Studies with longer follow-up should be conducted to answer or address the critical question about durability of effects.

PLAIN LANGUAGE SUMMARY

Supported employment for adults with severe mental illness

People with mental health problems experience high rates of unemployment. There are various schemes delivering support to people with mental health problems who are trying to find employment. Supported employment tries to place people into competitive jobs. People are placed quickly in normal work settings where they receive intensive support and training from 'job coaches'.

Individual placement and support (IPS) is a more specified scheme that includes: finding local jobs; a rapid job search; customer choice in what they want from the employment service; close working between employment and mental health teams; attention to people's preferred job, their strengths and work experience; ongoing and, if necessary, long-term individual support; and the benefits of counselling. Employment specialists act to identify people's job interests, assist with job finding, give job support and engage other support services. IPS uses assertive outreach to deliver training, advice and vocational support in the community. Augmented supported employment is where employment support is given with other supplementary techniques, such as social skills training, motivational classes and various types of rehabilitation. Other approaches are many and varied, including: job workshops; job counselling; peer support; partnerships with business; and the Clubhouse model, which involves training, work experience, peer support and transitional employment and IPS because they do not search for immediate and competitive employment. However, all approaches involve periods of preparation, education and on-the-job training.

This review compares supported employment and IPS with other approaches for finding employment. Drawing from a total of 2259 people with mental health problems in 14 studies, the review has two main findings: 1) Supported employment increases the length and time of people's employment; 2) People on supported employment find jobs quicker. Supported employment and IPS are better than other approaches in these two respects, but there is limited information or measurable differences on other important issues for service users.

For example, there is little information on issues such as improving quality of life, impact on people's mental health, days in hospital and costs. Furthermore, the review built its main findings on limited statistical evidence drawn mainly from studies carried out in North America and Europe. Future studies should address a fuller range of information and outcomes. Longer studies are needed to see how long the effects of supported employment last.

This plain language summary has been written by a consumer Ben Gray from RETHINK.

SUMMARY OF FINDINGS FOR THE MAIN COMPARISON [Explanation]

Supported employment versus other vocational approaches for adults with severe mental illness

Patient or population: patients with adults with severe mental illness
Settings: community psychiatric/mental health service
Intervention: Supported employment versus other vocational approaches

Outcomes	Illustrative comparative risks* (95% CI)		Relative effect (95% CI)	No of Participants (studies)	Quality of the evidence (GRADE)	Comments
	Assumed risk	Corresponding risk				
	Other vocational approaches	Supported employment				
Employment - obtained any job during the study (high=better) Follow-up: mean 18 months	**Study population**		**RR 2.62** (2.18 to 3.16)	951 (7 studies)	⊕◯◯◯ **very low**[2,3]	
	202 per 1000[1]	**530 per 1000** (441 to 639)				
	Moderate					
	260 per 1000[1]	**681 per 1000** (567 to 822)				
Employment - days in competitive employment (primary outcome) - long term Follow-up: 24 months	The mean employment - days in competitive employment (primary outcome) - long term in the control groups was **16.85 days**	The mean employment - days in competitive employment (primary outcome) - long term in the intervention groups was **70.63 higher** (43.22 to 98.04 higher)		204 (1 study)	⊕◯◯◯ **very low**[4,5,6,7]	

Employment - days in any form of paid employment - long term Follow-up: mean 21 months	The mean employment - days in any form of paid employment - long term in the control groups was **43.75 days**	The mean employment - days in any form of paid employment - long term in the intervention groups was **84.94 higher** (51.99 to 117.89 higher)		510 (2 studies)	⊕○○○ **very low**[7,8,9,10]
Employment - job tenure for competitive employment (weeks) - long term Follow-up: 24 months	The mean employment - job tenure for competitive employment (weeks) - long term in the control groups was **2.5 weeks**	The mean employment - job tenure for competitive employment (weeks) - long term in the intervention groups was **9.86 higher** (5.36 to 14.36 higher)		204 (1 study)	⊕○○○ **very low**[5,6,7,11]
Employment - job tenure for any paid employment (weeks) - long term Follow-up: mean 22 months	The mean employment - job tenure for any paid employment (weeks) - long term in the control groups was **15.43 weeks**	The mean employment - job tenure for any paid employment (weeks) - long term in the intervention groups was **3.86 higher** (-5.66 lower to 13.38 higher)		423 (2 studies)	⊕○○○ **very low**[6,7,12,13]
Time (days) to first competitive employment - long term Follow-up: 24 months	The mean time (days) to first competitive employment - long term in the control groups was **396.42 days**	The mean time (days) to first competitive employment - long term in the intervention groups was **161.6 lower** (225.73 to 97.47 lower)		204 (1 study)	⊕○○○ **very low**[4,5,6,7]

*The basis for the **assumed risk** (e.g. the median control group risk across studies) is provided in footnotes. The **corresponding risk** (and its 95% confidence interval) is based on the assumed risk in the comparison group and the **relative effect** of the intervention (and its 95% CI).
CI: Confidence interval; **RR:** Risk ratio;

GRADE Working Group grades of evidence
High quality: Further research is very unlikely to change our confidence in the estimate of effect.
Moderate quality: Further research is likely to have an important impact on our confidence in the estimate of effect and may change the estimate.
Low quality: Further research is very likely to have an important impact on our confidence in the estimate of effect and is likely to change the estimate.
Very low quality: We are very uncertain about the estimate.

[1] Median control risk across studies.
[2] Risk of bias: rated 'high' - all studies were non-blind; four of the seven studies did not describe allocation concealment.
[3] Inconsistency: rated 'very serious' - heterogeneity substantial $Chi^2 = 22.87$, df = 6 (P = 0.0008); $I^2 = 74\%$.
[4] Risk of bias: rated 'serious' - one included (Mueser 2004) study was not double-blinded nor described allocation concealment.
[5] Inconsistency: rated 'very serious' - only one study presented data, the remaining six studies were presented separately due to considerable skewed data, which presented high degrees of heterogeneity when assessed together.
[6] Imprecision - rated 'serious': small sample sizes; data were skewed, but as per protocol (where there were N=200 in an included study or greater) data from this one study was used.
[7] Publication bias - rated 'likely': There were few included studies and might be some publication bias.
[8] Risk of bias: rated 'serious' - both included (Burns 2007; Mueser 2004) studies were not double-blinded nor described allocation concealment; also unclear as to losses to follow-up.
[9] Inconsistency: rated 'very serious' - only two studies presented data, the remaining eight studies were presented separately due to considerable skewed data, which presented high degrees of heterogeneity when assessed together.
[10] Imprecision - rated 'serious': small sample sizes; data were skewed, but as per protocol (where there were N=200 in an included study or greater) data from this one study was used.
[11] Risk of bias: rated 'serious' - one included (Mueser 2004) study was not double-blinded nor described allocation concealment; also unclear as to losses to follow-up.
[12] Risk of bias: rated 'serious' - all included (Burns 2007; Lehman 2002; Mueser 2004) studies were not double-blinded nor described allocation concealment; also unclear as to losses to follow-up.
[13] Inconsistency: rated 'very serious' - high degrees of heterogeneity in results; $Chi^2 = 3.73$, df = 1 (P = 0.05); $I^2 = 73\%$.

BACKGROUND

Description of the condition

People who suffer from severe mental disorder experience high rates of unemployment. A review of eight controlled trials demonstrated that employment rates for people with schizophrenia, even with optimal support, ranged from only 30% to 80%, with a median of 60% across these studies (Bond 2004). These low employment rates reflect the disability caused by severe mental illness, but they may 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 1995). Despite high unemployment rates amongst people with severe mental illness, surveys have consistently shown that most want to work (Hatfield 1992; Lehman 1995; Shepherd 1994). Mental health issues said to be linked to unemployment include: cognitive impairment, psychotic symptoms, negative symptoms, fear of losing benefits, stigma and lack of access to employment services (Bond 1991; Bond 2008b; Cook 2006; Rosenheck 2006; Rutman 1994).

Description of the intervention

Supported employment is an approach to vocational rehabilitation that involves 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 1999). Proponents of supported employment had two objections to pre-vocational training, which adheres to the key principle that a period of preparation is necessary before entering competitive employment (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).

The individual placement and support (IPS) model is a carefully specified form of supported employment that is based on close adherence to seven key principles (Mueser 2004). These principles are: (a) the goal is competitive employment in work settings integrated into a community's economy; (b) services are based on clients' choices; (c) clients are expected to obtain jobs directly, rather than following lengthy pre-employment training (rapid job search); (d) attention to patient preference in the job search; (e) integration between employment services and mental health treatment teams; (f) ongoing individual support; and (g) systematic benefits counselling (Bond 2008a).

Adherence to individual placement and support guidelines may be measured using a fidelity scale (Bond 1997b). In IPS, employment specialists serve on clients' treatment teams alongside other staff, such as case managers and psychiatrists. Each employment specialist provides the full range of vocational services to each client, including engagement in services, identifying job interests and vocational assessment, job finding and job support. IPS uses assertive outreach (Stein 1998) to deliver vocational services in the community rather than at mental health or rehabilitation agencies (Bond 1997b).

How the intervention might work

Supported employment is defined as 'paid work that takes place in normal work settings with provision for ongoing support services' (Becker 1994; Bond 1999). It helps people with mental illness to work by placing them 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). Listed below are critical components which are common in successful supported employment programs (Bond 2001).

1. The agency providing the services is committed to help clients with attaining competitive employment.
2. A rapid job search rather than lengthy pre-employment assessment, training, and counselling is provided for clients.
3. Staff and clients find individualised job placements according to client preferences, strengths, and work experiences.
4. Follow-along supports are provided indefinitely.
5. The program is closely integrated with the mental health treatment team.

Supported employment is also provided for clients with autism (Keel 1997), mental retardation (Walsh 1994), and traumatic brain injuries (Wehman 2003), though its effectiveness for these populations is yet to be confirmed.

Why it is important to do this review

A previous Cochrane review (Crowther 2001) and another systematic review (Twamley 2003) have examined the effectiveness of various types of vocational rehabilitation for individuals with severe mental illness, including supported employment, but as several new trials of supported employment have been published recently a review focusing purely on supported employment is required. These trials have been covered in two narrative reviews (Bond 2004; Bond 2008a), but there have been no formal meta-analytic summaries as yet.

OBJECTIVES

1. To review the effectiveness of supported employment compared with other approaches to vocational rehabilitation and treatment as usual.

2. Secondary objectives are to establish how far:

i) fidelity to the IPS model affects the effectiveness of supported employment;

ii) the effectiveness of supported employment can be augmented by the addition of other interventions.

METHODS

Criteria for considering studies for this review

Types of studies

Randomised controlled trials (RCTs) that assess the effects of supported employment in people with severe mental illness. We excluded quasi-randomised studies, such as those allocating by using alternate days of the week.

Types of participants

The supported employment was not designed for a specific diagnostic group nor was it 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 the supported employment services. Specific inclusion criteria were that a majority of clients in the trial were (a) of working age (normally 16 to 70 years); (b) unemployed; and (c) suffering from severe mental illness, defined as: schizophrenia and schizophrenia-like disorders; bipolar disorders; or depression with psychotic features. Trials were included where a majority of participants (more than 50%) were suffering from schizophrenia and schizophrenia-like disorders; bipolar disorders; or depression with psychotic features. Substance abuse and post traumatic stress disorder were not considered severe mental illness, but trials were eligible if participants had a problem with substance abuse and/or comorbidity of post traumatic stress disorder in addition to severe mental illness. We excluded trials where a majority of participants (more than 50%) were suffering from a learning disability as the sole psychiatric diagnosis.

Types of interventions

Three interventions of interest were defined: supported employment (including Individual Placement and Support (IPS), and Augmented Supported Employment), other vocational approaches and treatment as usual.

1. Supported employment

Supported employment is a technique designed to help mentally ill people obtain and keep competitive employment. Supported employment aims to help clients obtain competitive work as quickly as possible and provides ongoing support to help them keep their employment (Bond 2001; Mueser 2004).

1.1 Individual placement and support (IPS)

IPS is a carefully specified approach to supported employment that requires close adherence to the seven principles described above. Fidelity to the IPS model can be assessed using an IPS Fidelity Scale (Becker 2001). IPS is classified into two categories: (i) Low fidelity IPS and (ii) High fidelity IPS. The seven key principles described in Description of the intervention are taken into consideration to assess the fidelity (Bond 1997b). Low fidelity IPS is defined as a) the programme itself does not satisfy one or more of the seven key principles, for example, if the same personnel are in charge of employment services and clinical services; b) although the programme does satisfy all the seven criteria, the quality assessment reveals that the actual delivery of the programme did not satisfy one or more of the seven key principles; or c) the quality of the actual delivery was not assessed. High fidelity IPS is when the programme satisfies all seven criteria.
Fidelity of IPS was assessed by the following two-step procedure.

1. Two review authors (YK and KK) independently selected RCTs that assured fidelity of IPS using the IPS scale (Bond 1997b). Trials that did not fulfil this criterion were rated as low fidelity IPS.

2. The same two review authors checked the selected articles. If the detailed description, especially in terms of engagement and intensity, indicated low fidelity of IPS conducted in some of the RCTs, fidelity of such IPS was rated as low in this review. If not, fidelity of the IPS was classified as high. The reason for judgement for the low fidelity IPS is presented in Characteristics of included studies.

1.2 Augmented supported employment

Supported employment can be augmented with other interventions, such as motivational interventions, social skills training and cognitive rehabilitation (Bell 2008; Drake 2008; McGurk 2007; Mueser 2005; Tsang 2007; Wallace 2004).

2. Other vocational approaches

Other vocational approaches are described in detail in another Cochrane review (Crowther 2001) and include sheltered workshop; prevocational training classes; job counselling; and the Clubhouse model - this model provides (a) work experiences through clubhouse work units; (b) transitional employment (the participant works for a limited period in a paid position in a real workplace, but the position is "owned" by the employment agency

rather than the participant); and (c) peer support. In this model, the participant graduates from helping to maintain a patient-led "clubhouse", to transitional employment, and finally to competitive employment; and diversified placement approach - principles of this approach are: (a) goal of paid employment including but not limited to a competitive one; (b) gradualism (members move gradually through the vocational continuum); (c) flexibility in movement between placements; (d) peer support; and (f) partnerships with the business community (Bond 2004). All of these approaches differ from supported employment in that they do not place an emphasis on an immediate search for competitive employment, but prefer a period of preparation, before seeking competitive employment. We planned to treat them as a single control intervention.

3. Treatment as usual

Treatment as usual is defined as standard psychiatric care for participants in the trial, without any specific vocational component. It is assumed that both intervention and control participants will be receiving treatment as usual, which would normally include: medication, medication management, case management, and supportive psychotherapy (Bond 2008c).

Types of outcome measures

We grouped outcomes into short term (less than six months) medium term (six months to one year) and long term (over one year: a follow-up duration of 12 months was also considered as long term)

Primary outcomes

1. Employment: days in competitive employment (long term)

Secondary outcomes

1. Employment

1.1 Days in competitive employment (medium term)
1.2 Days in any form of paid employment (such as competitive employment, transitional employment, or sheltered employment with wage)
1.3 Earnings in the first year
1.4 Job tenure (weeks/work/person: for competitive employment and any paid employment)
1.5 Time to first competitive employment

2. Education

2.1 Days in any form of employment or education (including training courses or full or part-time education)

3. Leaving the study early (i.e. number of participants who dropped-out from service)

3.1 For any reason
3.2 Specific reason (as defined by individual studies)

4. Global state

4.1 Relapse
4.2 Time to relapse
4.3 No clinically important change in global state
4.4 Not any change in global state

5. Mental state

5.1 No clinically important change in general mental state
5.2 Not any change in general mental state
5.3 Average endpoint general mental state score
5.4 Average change in general mental state scores
5.5 No clinically important change in specific symptoms
5.6 Not any change in specific symptoms
5.7 Average endpoint specific symptom score
5.8 Average change in specific symptom scores

6. Service Use

6.1 Mean days in hospital
6.2 Number of participants admitted to hospital/re-hospitalised

7. Quality of life

7.1 No clinically important change in quality of life
7.2 Not any change in quality of life
7.3 Average endpoint quality of life score
7.4 Average change in quality of life scores
7.5 No clinically important change in specific aspects of quality of life
7.6 Not any change in specific aspects of quality of life
7.7 Average endpoint specific aspects of quality of life
7.8 Average change in specific aspects of quality of life

8. Social/General functioning

8.1 Average endpoint general functioning score (when Global Assessment of Functioning (GAF) was rated in symptoms and disability separately, a lower score was considered as general GAF score, and extracted and integrated in a meta-analysis)
8.2 Average change in general functioning scores
8.3 No clinically important change in specific aspects of functioning, such as social or life skills

8.4 Not any change in specific aspects of functioning, such as social or life skills
8.5 Average endpoint specific aspects of functioning, such as social or life skills
8.6 Average change in specific aspects of functioning, such as social or life skills

9. Adverse effects

9.1 Not any general adverse effects
9.2 Average endpoint general adverse effect score
9.3 Average change in general adverse effect scores
9.4 No clinically important change in specific adverse effects
9.5 Not any change in specific adverse effects
9.6 Average endpoint specific adverse effects
9.7 Average change in specific adverse effects
9.8 Death - natural and suicide

10. Economic Costs (excluding housing costs)

10.1 Direct costs
10.2 Indirect costs

11. Summary of findings

We used the GRADE approach to interpret findings (Schünemann 2008) and used GRADE profiler (GRADEPRO) to import data from RevMan 5.1 (Review Manager) to create 'Summary of findings' tables. These tables provide outcome-specific information concerning the overall quality of evidence from each included study in the comparison, the magnitude of effect of the interventions examined, and the sum of available data on all outcomes we rated as important to patient-care and decision making. We selected the following main outcomes for inclusion in the Summary of findings table:
1. Employment - obtained any job during the study
2. Employment - days in competitive employment (primary outcome) - long term
3. Employment - days in any form of paid employment - long term
4. Employment - job tenure for competitive employment (weeks) - long term
5. Employment - job tenure for any paid employment (weeks) - long term
6. Time (days) to first competitive employment

Search methods for identification of studies

Electronic searches

The Cochrane Schizophrenia Group Trials Register (Feb 2010) was searched using the phrase:

[(*employ* or ((*supp* or *transitional*) and (*employ* or *work*) or ((*psychosocial* or *psycho-social* or *psychiatric* or *occupational or *soc* or *work* or *job* or *counsel*) and *rehab*) or *sheltered work* or *vocatio* or *fountain house* or *fountain-house* or *clubhouse* or *club-house* or *occupat* or *job* or *work therap* or *delivery of health care* or *delivery of integrated delivery* in title, abstract and index fields in REFERENCE) or (*vocat* or work* or *employ* or * job* or *occupat* or * placem* or *rehab*) in STUDY interventions)]
This register is compiled by systematic searches of major databases, handsearches and conference proceedings (see group module).

Searching other resources

1. 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.

2. Personal contact

We contacted researchers working in the field to identify unpublished studies.

Data collection and analysis

Selection of studies

Two review authors (YK and KK) independently inspected all the citations identified by the search and requested all potentially relevant articles, contacting the trial authors where necessary. Once the full articles had been obtained, two review authors independently decided whether the studies met the inclusion criteria. In the event of a disagreement, a third reviewer adjudicated and made a final decision. If it was not possible to obtain sufficient information to judge whether a study met inclusion criteria, it was placed in the list of studies awaiting assessment until such information became available.

Data extraction and management

1. Extraction

Two review authors (YK and KK) independently extracted data from the selected trials using a double-entry method. In the event of a difference between the review authors, they sought to resolve the difference by further scrutiny of the original trial reports, and involved a third review author and/or contacted the authors for further information.

2. Management

We extracted data onto standard, simple forms.

3. Scale-derived data

We included continuous data from rating scales only if: (a) the psychometric properties of the measuring instrument had been described in a peer-reviewed journal (Marshall 2000); (b) the measuring instrument was not written or modified by one of the trialists; (c) the measuring instrument was either (i) a self-report or (ii) completed by an independent rater or relative (not the therapist).

Assessment of risk of bias in included studies

Review authors YK, KK and/or MH worked independently by using criteria described in the *Cochrane Handbook for Systematic Reviews of Interventions* (Higgins 2011) to assess trial quality. This new set of criteria is based on evidence of associations between overestimate of effect and high risk of bias of the article such as sequence generation, allocation concealment, blinding, incomplete outcome data and selective reporting.

Where inadequate details of randomisation and other characteristics of trials were provided, we contacted authors of the studies in order to obtain additional information.

We noted the level of risk of bias in both the text of the review and in the Summary of findings for the main comparison.

Measures of treatment effect

1. Binary outcomes

Where binary outcomes (proportions) were used, we calculated fixed-effect risk ratios (RR) (Furukawa 2002), with 95% confidence intervals (CIs) for each outcome. In the event of significant heterogeneity, we used a random-effects model. The RR was chosen over the odds ratio because the latter tends to overstate effect size when event rates are high (Higgins 2011).

2. Continuous data

2.1 Summary statistic

For continuous outcomes, we estimated a mean difference (MD) between groups. We preferred not to calculate effect size measures (standardised mean difference SMD). However, if scales of very considerable similarity were used, we would have presumed there was a small difference in measurement, and would have calculated effect size and transformed the effect back to the units of one or more of the specific instruments.

2.2 Endpoint versus change data

Since there is no principal statistical reason why endpoint and change data should measure different effects (Higgins 2011), we used scale endpoint data which was easier to interpret from a clinical point of view. If endpoint data were not available, we used change data.

2.3 Skewed data

Continuous data on clinical and social outcomes are often not normally distributed. To avoid the pitfall of applying parametric tests to non-parametric data, we aimed to apply the following standards to all data before inclusion: (a) standard deviations (SDs) and means are reported in the paper or obtainable from the authors; (b) when a scale starts from the finite number zero, the SD, when multiplied by two, is less than the mean (as otherwise the mean is unlikely to be an appropriate measure of the centre of the distribution, (Altman 1996); (c) if a scale starts from a positive value (such as the Positive and Negative Syndrome Scale (PANSS) which can have values from 30 to 210), the calculation described above is modified to take the scale starting point into account. In these cases skew is present if 2SD > (S-S min), where S is the mean score and S min is the minimum score. Endpoint scores on scales often have a finite start and end point and these rules can be applied. Skewed endpoint data from studies of less than 200 participants were entered as 'other data' within the data and analysis section rather than into a statistical analysis. Skewed data pose less of a problem when looking at means if the sample size was large (over 200 participants) and they were entered into syntheses. When continuous data are presented on a scale which includes a possibility of negative values (such as change data), it is difficult to tell whether data are skewed or not, skewed change data were entered into statistical analysis.

2.4 Data synthesis

When standard errors instead of SDs were presented, the former were converted to SDs. If SDs were not reported and could not be calculated from available data, authors were asked to supply the data. In the absence of data from authors, the mean SD from other studies was used.

Unit of analysis issues

1. Cluster trials

Studies increasingly employ 'cluster randomisation' (such as randomisation by clinician or practice) but analysis and pooling of clustered data poses problems. Firstly, authors often fail to account for intra class correlation in clustered studies, leading to a 'unit of analysis' error (Divine 1992) whereby P values are spuriously low, confidence intervals unduly narrow and statistical significance

overestimated. This causes type I errors (Bland 1997; Gulliford 1999).

Where clustering had not been accounted for in primary studies, we presented the data in a table, with a (*) symbol to indicate the presence of a probable unit of analysis error. In subsequent versions of this review we will contact first authors of studies to obtain intra class correlation coefficients (ICCs) of their clustered data and adjust for this by using accepted methods (Gulliford 1999). Where clustering had been incorporated into the analysis of primary studies, we also presented these data as if from a non-cluster randomised study, but adjusted for the clustering effect.

The binary data as presented in a report should be divided by a 'design effect' (Raj 2009). This is calculated using the mean number of participants per cluster (m) and the ICC [Design effect = 1+(m-1)*ICC] (Donner 2002). If the ICC had not been reported it was assumed to be 0.1 (Ukoumunne 1999).

2. Studies with multiple treatment groups

Where a study involved more than two treatment groups, if relevant, the additional treatment groups were presented in additional relevant comparisons. Data were not double counted. Where the additional treatment groups were not relevant, these data were not reproduced.

Dealing with missing data

1. Overall loss of credibility

At some degree of loss of follow-up, data must lose credibility (Xia 2007). Where more than 40% of data were unaccounted for, we did not reproduce these data or use them within analyses.

2. Binary

In the case where attrition for a binary outcome was between 0% and 40% and outcomes of these people were described, we included these data as reported. Where these data were not clearly described, data were presented on a 'once-randomised-always-analyse' basis, assuming an intention-to-treat analysis. Those lost to follow-up were all assumed to have a negative outcome. For example, for the outcome of employment, those who were lost to follow-up were all considered to be unemployed. A final sensitivity analysis was undertaken to test how prone the primary outcomes were to change when 'completed' data only were compared to the intention-to-treat to treat analysis using the negative assumption.

3. Continuous

In the case where attrition for a continuous outcome was between 0% and 40% and completer-only data were reported, we reproduced these.

4. Intention-to-treat (ITT)

Intention-to-treat (ITT) was used when available. We anticipated that in some studies, in order to undertake an ITT analysis, the method of last observation carried forward (LOCF) was employed within the study report. As with all methods of imputation to deal with missing data, LOCF introduces uncertainty about the reliability of the results. Therefore, where LOCF data had been used in the analysis, they were indicated in the review.

Assessment of heterogeneity

1. Clinical heterogeneity

We considered all included studies, hoping to use all studies together. Where clear unforeseen issues were apparent that may have added obvious clinical heterogeneity, we noted these issues, considered them in the analyses and undertook sensitivity analyses for the primary outcome.

2. Statistical

2.1 Visual inspection

We visually inspected graphs to investigate the possibility of statistical heterogeneity.

2.2 Employing the I^2 statistic

Heterogeneity between studies was investigated by using the I^2 method (Higgins 2003) and the Chi^2 'P' value. The former provides an estimate of the percentage of variation in observed results thought unlikely to be due to chance. A value equal to or greater than 50% was taken to indicate heterogeneity and the reason for heterogeneity was explored. If the inconsistency was high and the clear reasons were found, the data were presented separately.

Assessment of reporting biases

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. The possible existence of small study effects was examined by Egger's regression method (Egger 1997) as well as by visual inspection of the graph (see Results).

Data synthesis

In the absence of significant heterogeneity, a fixed-effect model was used. However, if significant heterogeneity was demonstrated, a random-effects model was used for analysis. Where available, the analyses were based on intention-to-treat data from the individual studies. The data from included trials were combined in a meta-

analysis if they were sufficiently homogeneous, both clinically and statistically.

Subgroup analysis and investigation of heterogeneity

1. Pre-planned subgroup analyses

Subgroup analyses should be performed and interpreted with caution because multiple analyses will lead to false positive conclusions (Oxman 1992). However, we performed the following subgroup analyses, where possible, for the following a priori reasons.
(a) High fidelity IPS versus other vocational approaches.
(b) Augmented supported employment versus other vocational approaches.

2. Regression analyses

If we had included a sufficient number of trials (roughly nine to 11) per independent variable, meta-regression would have been performed to determine whether various study-level characteristics affect effect sizes. Possible effect modifiers to be examined in future updates of this review include: study location (USA versus other countries), study location (urban versus rural) and the local unemployment rate. STATA would have been used to perform the meta-regression (STATA 2005).

Sensitivity analysis

We examined the robustness of our findings by excluding (i) studies with less than 80% follow-up on the variable at the time point (ii) skewed data (iii) trials with a high risk of bias or where the overall risk of bias was unclear, and (iv) studies where IPS was augmented with other interventions.

RESULTS

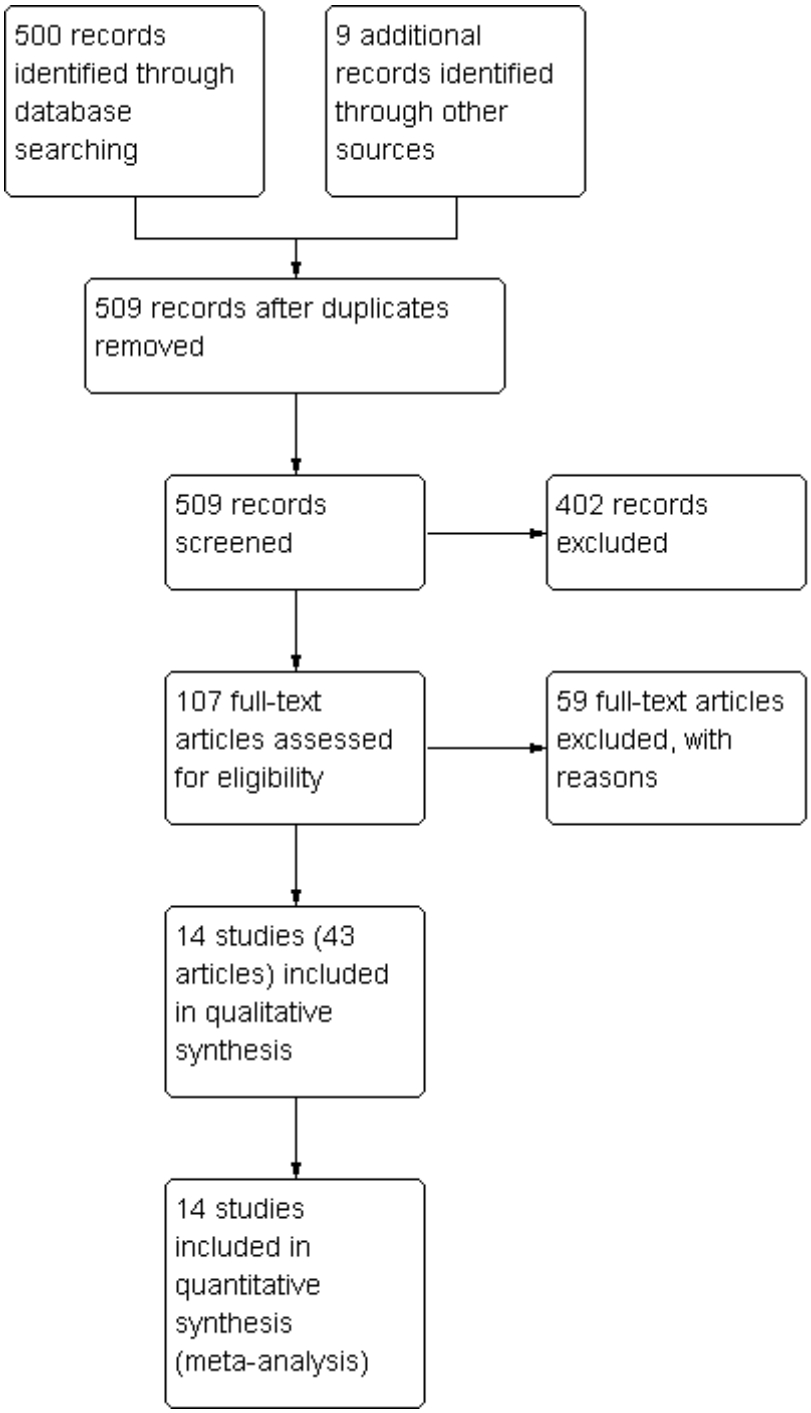
Description of studies

See:Characteristics of included studies; Characteristics of excluded studies; Characteristics of ongoing studies.

Results of the search

Electronic searches identified 500 references with 9 additional records identified through other sources. After duplicates were removed, we screened 509 records. 107 potentially relevant records were obtained and scrutinised and 59 of these reports did not meet the inclusion criteria (see Characteristics of excluded studies) and had to be excluded. Fourteen trials are included (Figure 1).

Figure 1. Study flow diagram.



Included studies

Two review authors (YK and KK) checked the strict eligibility of the identified studies. They agreed on 98 articles (91.6 %) but disagreed on eight articles. The latter were discussed with a third review author (TAF) and according to the consensus among the authors remaining discrepancies were resolved, One additional study (Bayer 2008) was written in German and judged not eligible by one review author (TAF) who can read and understand German. Forty-seven articles describing 20 studies were finally judged eligible. Of these, five trials (eight articles) (Bejerholm 2009 (SE142); McFarlane 2000; McFarlane 2008 (SE147); Michon 2010; Nuechterlein 2008) are either still underway; are being written-up; in process of publication; or required further details and therefore cannot be included in the present version of the review.

1. Study size

A total of 2265 participants were included from 14 trials. The median sample size per arm was 70 participants (range 20-156).

2. Study design

Twelve studies were two-arm studies, the remaining (Mueser 2004; Tsang 2009) were multi-arm studies.

3. Participants

All 14 studies recruited outpatients. Thirteen RCTs were conducted in the setting of community psychiatric/mental health service. Participants were adults with severe mental illness, with schizophrenia or schizoaffective disorder well represented. Eleven RCTs used DSM-IV (Diagnostic and Statistical Manual) or ICD 10 (International Classification of Diseases) criteria and three studies adopted DSM-III-R criteria. Two studies used other diagnostic criteria (Indiana Department of Mental Health Criteria, OPCRIT, and the Federal Center for Mental Health Services' criteria) (Burns 2007; Gold 2006). No description was given about diagnostic criteria in one RCT (Wong 2008). Men were well represented. There were insufficient data to assess representation of people from ethnic minorities.

4. Interventions and comparators

All included studies compared supported employment with other vocational approaches. Among these, 13 studies (Bond 2007; Burns 2007; Drake 1996; Drake 1999; Gold 2006; Howard 2010; Killackey 2008; Latimer 2006; Lehman 2002; Mueser 2004; Tsang 2009; Twamley 2008; Wong 2008) implemented individual placement and support (IPS) as supported employment and one RCT (Macias 2006) adopted supported employment, which was not defined as IPS.

Tsang 2009 consisted of integrated supported employment (ISE), IPS and traditional vocational rehabilitation, and Mueser 2004 involved IPS, standard services including supported employment, and psychosocial rehabilitation program. Only one study (Tsang 2009) implemented augmented supported employment. Detailed information of interventions adopted in each site from the Employment Intervention Demonstration Program (EIDP) (Gold 2006; Lehman 2002; Macias 2006; Mueser 2004; Blankertz 1997; Cook 2005; McFarlane 2002 (SE175); Toprac 2002) were also obtained via the Internet (EIDP website).

In terms of fidelity check of implementation of supported employment, 12 studies used the IPS fidelity scale (Bond 1997b) and two adopted other procedures defined in each study (Drake 1996; Macias 2006).

5. Outcomes

Of the 14 included studies, 13 reported vocational and/or non-vocational data (either as dichotomous or as continuous outcomes) that could be entered into a meta-analysis. All included studies reported attrition due to any reason; 13 studies provided data for this outcome.

5.1 Primary outcomes and secondary outcomes

Seven out of the 14 included studies reported data for our primary outcome of interest of days in competitive employment. At least one study provided data on each of the remaining secondary outcomes, except for time spent in education, and relapse.

5.2 Outcome scales

5.2.1 Mental state

5.2.1.1 Positive and Negative Syndrome Scale - PANSS (Kay 1987)

This is a 30-item scale, each of which can be defined on a seven-point scoring system from absent to extreme. It has three subscales for measuring the severity of general psychopathology, positive symptoms (PANSS-P), and negative symptoms (PANSS-N). A low score indicates lesser severity. Two studies (Bond 2007; Burns 2007) reported data from this scale.

5.2.1.2 Brief Psychiatric Rating Score - BPRS (Overall 1962)

This scale is used to assess the severity of abnormal mental state. A revised 18-item scale is commonly used, though the original scale has 16 items. 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. Only one study reported this outcome (Drake 1999).

5.2.1.3 Hospital Anxiety and Depression Scale - HADS (Zigmond 1983).

This scale is a self-rating instrument for anxiety and depression in patients with both somatic and mental problems. The scale consists of 14 items on a four-point Likert scale (range 0-3). The total score is the sum of the 14 items, and for each subscale the score is the sum of the respective seven items. One study (Burns 2007) reported data from this scale.

5.2.2 Quality of Life

5.2.2.1 Quality of Life Interview - QOLI (Lehman 1982)

The scale is a self-rating instrument in which participants respond on a Likert scale for all items. Two different Likert scales were used; the first Likert scale ranged from one, "terrible" to 10 "delighted."and the second ranged from one, "not at all" to five, "at least once a day."The QOLI assesses objective and subjective quality of life indicators and includes such areas as leisure activities, social relationships, living situations, health, employment and vocational services, and finances. Scoring was performed by adding up scores on all items to obtain a total quality of life score. The original version consists of 143 items and the abbreviated version has thirteen sections consisting of 35 total items. Three studies (Bond 2007, Drake 1999, and Twamley 2008) reported data from this scale.

5.2.2.2 Lancashire Quality of Life Profile European version - LQoLP-EU (Gaite 2000)

This scale was originally developed from the QOLI. It is a structured interview comprising 105 items. It includes nine domains: work and education (seven items); leisure and participation (eight items); religion (four items); finances (seven items); living situation (12 items); legal status and safety (five items); family relations (seven items); social relations (six items) ; and health (10 items).The interview can also assess positive and negative affect; self-esteem; global well-being; quality of life of the patient independent of the patient's own opinion. Two studies (Burns 2007 and Howard 2010) reported data from this scale.

5.2.3 General functioning score

5.2.3.1 Global Assessment Scale - GAS or Global Assessment of Functioning - GAF (Endicott 1976)

This scale is a clinician-rated scale of overall functioning on a scale of 1-100. Lower scores indicate poorer functioning. Three studies reported data from this scale (Burns 2007; Drake 1999; Howard 2010).

Excluded studies

Of the 107 references retrieved for more detailed evaluation, 58 articles did not meet our inclusion criteria and were excluded. Reasons for this are presented in the 'Characteristics of excluded studies' table.

Awaiting classification

Two studies are considered as awaiting classification (McFarlane 2000; Michon 2010).

Ongoing Studies

Three studies are ongoing (Bejerholm 2009 (SE142); McFarlane 2008 (SE147); Nuechterlein 2008).

Risk of bias in included studies

See: Included studies, Figure 2, Figure 3.

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

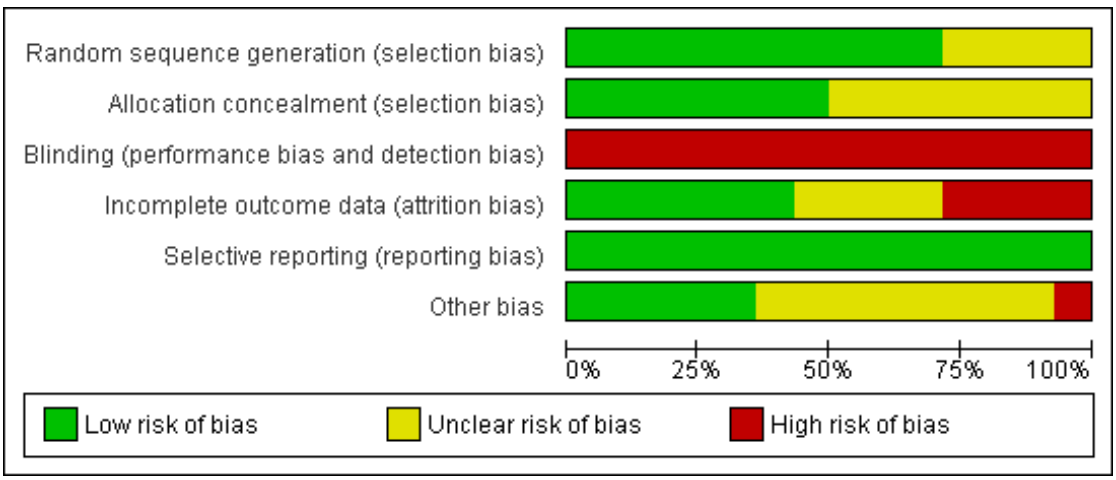
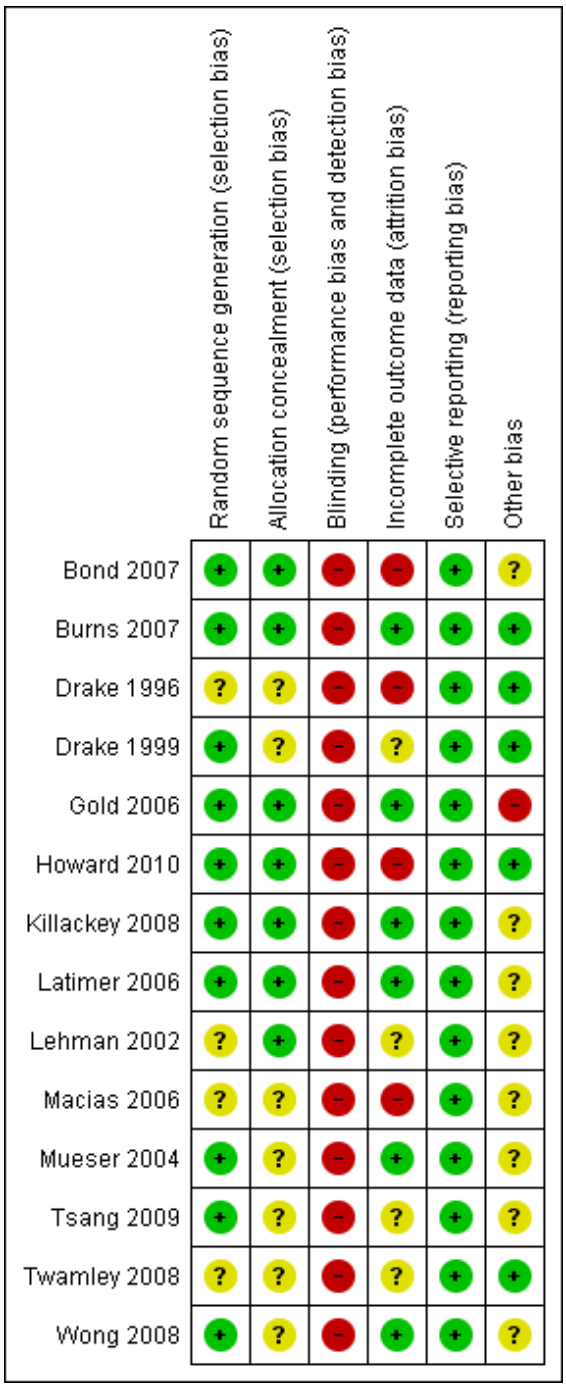


Figure 3. 'Risk of bias' summary: review authors' judgements about each risk of bias item for each included study.



Our judgment about the overall risk of bias in the individual studies is illustrated in Figure 2 and Figure 3. Overall, the methodological quality of the included studies was moderate, with a high risk of bias for blinding across all included studies due to the open nature of the intervention. This type of reporting has been associated with an overestimate of the estimate of effect (Schulz 1995) and this should be considered when interpreting the results.

Allocation

Nine studies reported the methods of generating random sequence, in which "a computer originated schedule" was used, while enough description was not given and risk of bias was unclear with regard to sequence generation in six trials. In terms of allocation concealment, seven studies reported enough details, but risk of bias was unclear in the eight remaining studies. Therefore, we were not assured that bias was minimised during the allocation procedure in the other studies, yet the great majority of them reported that the participants allocated to each treatment group were "similar", "the same", "not significantly different", "comparable" or "matched".

Blinding

It is in the nature of studies for psychosocial interventions, that it is not possible for participants or those administering the intervention to be masked to the participants' allocation status. Therefore, none of the studies were double-blinded. The reported results may exaggerate estimates of treatment effect (Boutron 2004). Nevertheless, three studies reported that the rater, assessor or interviewer was blind to the assignment (Howard 2010; Tsang 2009; Twamley 2008).

Incomplete outcome data

Total attrition rate was moderate and ranged from 2% (Drake 1999) to 32% (Lehman 2002). In six studies, the total dropout rates were more than 20% (Bond 2007; Gold 2006; Lehman 2002; Macias 2006; Tsang 2009; Twamley 2008).

Selective reporting

All included studies were rated as high quality in reporting outcome with a low risk of reporting bias. In terms of the Employment Intervention Demonstration Program (EIDP), data from one of the eight RCTs which seemed eligible (Arizona site) were not available due to lack of publication (EIDP website). This might be a source of publication bias.

Other potential sources of bias

Relatively small sample size in many of the studies might have reduced the opportunity to have comparable groups thus threatening internal validity, and might also have resulted in under-powered studies, thus increasing chances of false positive outcomes. Moreover, the comparatively short duration of follow-up might be insufficient to answer or address the critical question about durability of effects. In one study (Gold 2006), project redesign and deviation from a pre-specified random assignment process may have compromised study validity.

Effects of interventions

See: **Summary of findings for the main comparison** Supported employment versus other vocational approaches for adults with severe mental illness

COMPARISON 1: Supported employment versus other vocational approaches

1.1 Employment (continuous outcomes)

Eleven studies (Bond 2007; Drake 1996; Drake 1999; Gold 2006; Killackey 2008; Latimer 2006; Macias 2006; Mueser 2004; Tsang 2009; Twamley 2008; Wong 2008) reported competitive employment outcomes. All data for this outcome were skewed; however, as per our protocol, where studies had n = 200 participants or more, these were included in data synthesis. Data from the remaining studies were presented as 'Other data' in the Data and analyses section. Data demonstrate high levels of heterogeneity are presented using a random effects model.

1.1.1 days in competitive employment (primary outcome) - long term

For days in competitive employment, we found only one relevant trial (n = 204) (Mueser 2004) which demonstrated statistically significant favour for supported employment over other vocational approaches (MD 70.63 CI 43.22 to 98.04, Analysis 1.1).

1.1.2 days in any form of paid employment - long term

In this subgroup we found two relevant trials (n = 510). There was statistically significant favour for supported employment over other vocational approaches (MD 84.94 CI 51.99 to 117.89, Analysis 1.1); however, with moderate levels of heterogeneity (Chi2= 1.85; df=1; P=0.173; I2=46%).

1.1.3 job tenure for competitive employment (weeks) - long term

In this subgroup we only found one relevant trial (n = 204) (Mueser 2004). There was statistically significant favour for supported employment over other vocational approaches (MD 9.86 CI 5.36 to 14.36, Analysis 1.1).

1.1.4 job tenure for any paid employment (weeks) - long term

Data from two studies showed no significant difference between groups (n = 423, Analysis 1.1), with substantial levels of heterogeneity (Chi2=3.73; df=1; P=0.054; I2=73%).

1.2 Employment (skewed data)

Skewed data from studies of less than n = 200 were entered as 'Other data' in the Data and analyses section; all data need interpreting with caution. Data from the majority of studies that reported employment outcomes of days in in employment and job tenure are heavily skewed, and are best inspected by viewing Analysis 1.2.

1.2.1 Days in competitive employment

Data at short and medium term suggest a trend favouring supported employment over other vocational approaches for days spent in competitive employment; however these data need interpreting in light of the considerable skew present (Analysis 1.2).

1.2.2 Days in any form of paid employment

There was indication that there were more days spent in any form of paid employment for supported employment at both medium and long term (Analysis 1.2); again, data are skewed and need interpreting with caution.

1.2.3 Job tenure for competitive employment (weeks)

Taking into account the considerable skewed data, at medium term, results indicated more weeks of job tenure for other vocational approaches, and the opposite at long term; again, data are skewed and need interpreting with caution (Analysis 1.2).

1.2.4 Job tenure for any paid employment (weeks)

Data are considerably skewed and are best inspected by viewing the 'Other data' table (Analysis 1.2).

1.2.5 Earnings in the first year

Greater earnings in the first year were associated with participants receiving supported employment; again, data are skewed and need interpreting with caution (Analysis 1.2).

1.3 Employment (dichotomous outcomes)

1.3.1 obtained competitive job during the study (high=better)

Seven studies reported data for this outcome (n = 951); there was a statistically significant difference between supported employment and other vocational approaches (RR 3.24 CI 2.17 to 4.82, Analysis 1.2). However, data demonstrated substantial levels of heterogeneity and are analysed using a random effects model (Chi2= 22.87; df=6; P=0.0008; I2=74%).

1.4 Time (days) to first competitive employment

1.4.1 long term

Again, all data for this outcome were skewed; however, as per our protocol, where studies had n = 200 participants or more, these were included in the data synthesis. Data from the remaining studies were presented using 'Other data' tables in the Data and analyses section. There was evidence that supported employment was associated with less days to first competitive employment than other vocational approaches at long term (1 RCT, n = 204, MD -161.60, 95% CI -225.73 to -97.47, Analysis 1.4).

1.5 Time (days) to first competitive employment (skewed data)

Skewed data from studies of less than n = 200 were entered into 'Other data' tables in the Data and analyses section; all data need interpreting with caution (Analysis 1.5).

1.6 Leaving the study early for any reason

There was no significant difference between groups for leaving the study early in the short term (1 RCT, n = 92) or medium term (2 RCTs, n = 191). By long term, there was a statistically significant difference in favour of supported employment over other vocational approaches (RR 0.66 CI 0.52 to 0.84, Analysis 1.6) with moderate levels of heterogeneity (Chi2=13.62; df=9; P= 0.137; I2=34%).

1.7 Mental state: Average endpoint specific symptom score (high = worse) - long term

There was no evidence that supported employment was associated with a lower or higher endpoint specific symptom score than other vocational approaches when using the BPRS, PANSS or HADS scales (Analysis 1.7).

1.8 Service use: 1. Mean days in hospital (skew)

Data are considerably skewed and are best inspected by viewing the 'Other data' table (Analysis 1.8).

1.9 Service use: 2. Number of participants admitted to hospital

In the long term, there was no evidence that supported employment was associated with a lower or higher rate of participants admitted to hospital/re-hospitalised than other vocational approaches at long term (2 RCTs, n = 455, RR 0.71, 95% CI 0.53 to 0.96, Analysis 1.9).

1.10 Quality of Life: Average endpoint QOL-QOLI - various subscales (high = better)

There was no evidence that supported employment was associated with a lower or higher average endpoint quality of life score than other vocational approaches across the measured quality of life domains (Analysis 1.10)

1.11 Global/Social functioning: Average endpoint general functioning score - GAS (high = better)

There was no evidence that supported employment was associated with a lower or higher average endpoint general functioning score than other vocational approaches at long term (3 RCTs, n = 623, Analysis 1.11).

1.12 Adverse effects: Death - natural and suicide

There was no evidence that supported employment was associated with a lower or higher risk of death than other vocational approaches at long term (1 RCT, n = 312, Analysis 1.12).

1.13 Economic Costs (excluding housing costs): Direct costs (GPB £, skewed)

There was no evidence that supported employment was associated with lower or higher economic costs than other vocational approaches; data are considerably skewed and need interpreting with cation (Analysis 1.13).

2. Comparison 2. subgroup analysis: High fidelity IPS versus other vocational approaches

We included RCTs in which high fidelity of IPS was assured using the IPS scale (Bond 1997b) in this subgroup analysis. Though Howard 2010 fulfilled these criteria, the study was excluded from the analysis because the detailed description in the article indicated the low fidelity of IPS conducted in the RCT (See: Characteristics of included studies). Where data were considerably skewed in studies of less than n = 200, we excluded these data.

2.1 Employment

2.1.1 Days in competitive employment (primary outcome)

There was evidence that high fidelity IPS was associated with more days in competitive employment than other vocational approaches in the long term (1 RCT, n = 306, MD 99.80, 95% CI 69.50 to 130.10, Analysis 2.1).

2.1.2 Job tenure for any paid employment

There was no evidence that high fidelity IPS was associated with more or less longer or shorter job tenure for any paid employment than other vocational approaches in the long term (1 RCT, n = 225, Analysis 2.1).

2.2 Leaving the study early for any reason

There was no evidence that high fidelity IPS was associated with lower or higher rate of participants leaving the study early for any reason than other vocational approaches at short or medium term; however, significantly more people left the study early when receiving other vocational approaches, with moderate heterogeneity present overall (P = 0.02; I^2 = 49%, Analysis 2.2).

2.3 Mental state: average endpoint specific symptom score

There was no evidence that high fidelity IPS was associated with a lower or higher endpoint specific symptom score than other vocational approaches when using either the BPRS, PANSS or HAD scales (Analysis 2.3).

2.4 Service Use

2.4.1 Number of participants admitted to hospital/re-hospitalised

There was no evidence that high fidelity IPS was associated with a lower or higher rate of participants admitted to hospital/re-hospitalised than other vocational approaches (Analysis 2.4).

2.5 Quality of life: Average endpoint quality of life scores

2.5.1 Average endpoint QoL-QoLI - various subscales

There was no evidence that high fidelity IPS was associated with a lower or higher average endpoint quality of life score than other vocational approaches (Analysis 2.5)

2.6 Global/Social functioning: Average endpoint general functioning score

There was no evidence that high fidelity IPS was associated with a lower or higher average endpoint general functioning score than other vocational approaches in the long term (Analysis 2.6).

2.7 Adverse effects: Death - natural and suicide

There was no evidence that high fidelity IPS was associated with a lower or higher risk of death than other vocational approaches (Analysis 2.7).

3. COMPARISON 3: subgroup analysis: Augmented supported employment versus other vocational approaches

This subgroup analysis was not conducted due to the reason described in Summary of main results.

4. Funnel Plot Analysis

As stated in the protocol, analyses were carried out as head-to head comparisons. Where available, the funnel plot analyses did not suggest evidence of publication bias (Figure 4, Figure 5, Figure 6), however, for many comparisons the presence of publication bias was not examined because there were insufficient trials to allow meaningful formal assessment using funnel plots.

Figure 4. Funnel plot of comparison: 1 Supported employment versus other vocational approaches, outcome: 1.1 Employment.

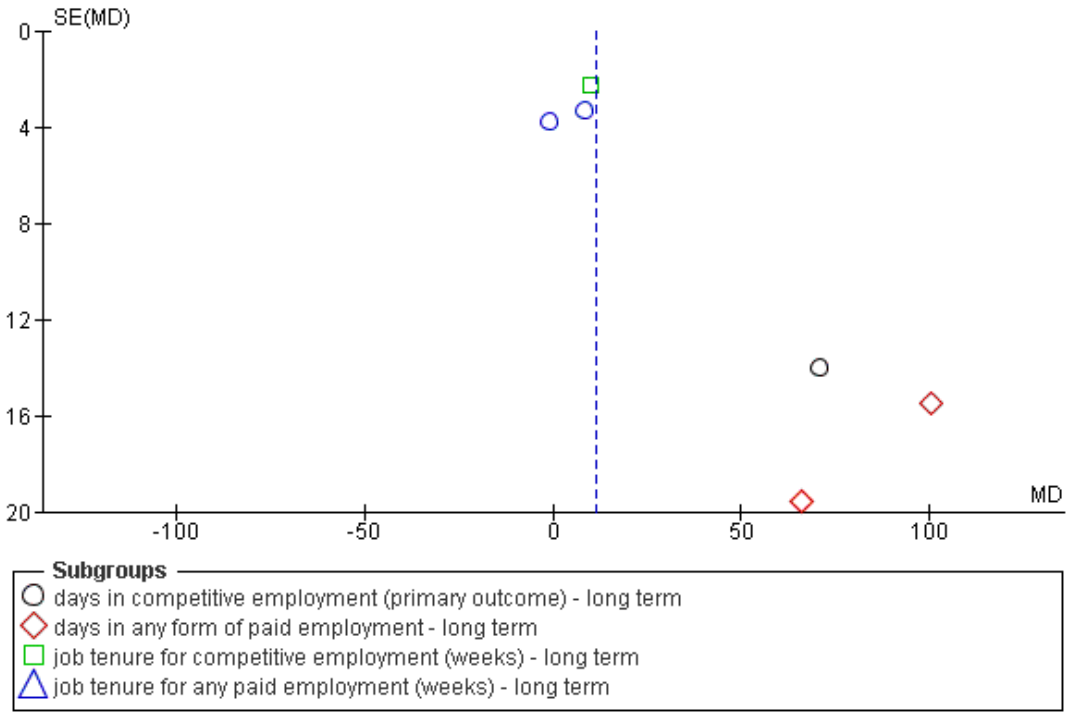


Figure 5. Funnel plot of comparison: 1 Supported employment versus other vocational approaches, outcome: 1.3 Employment.

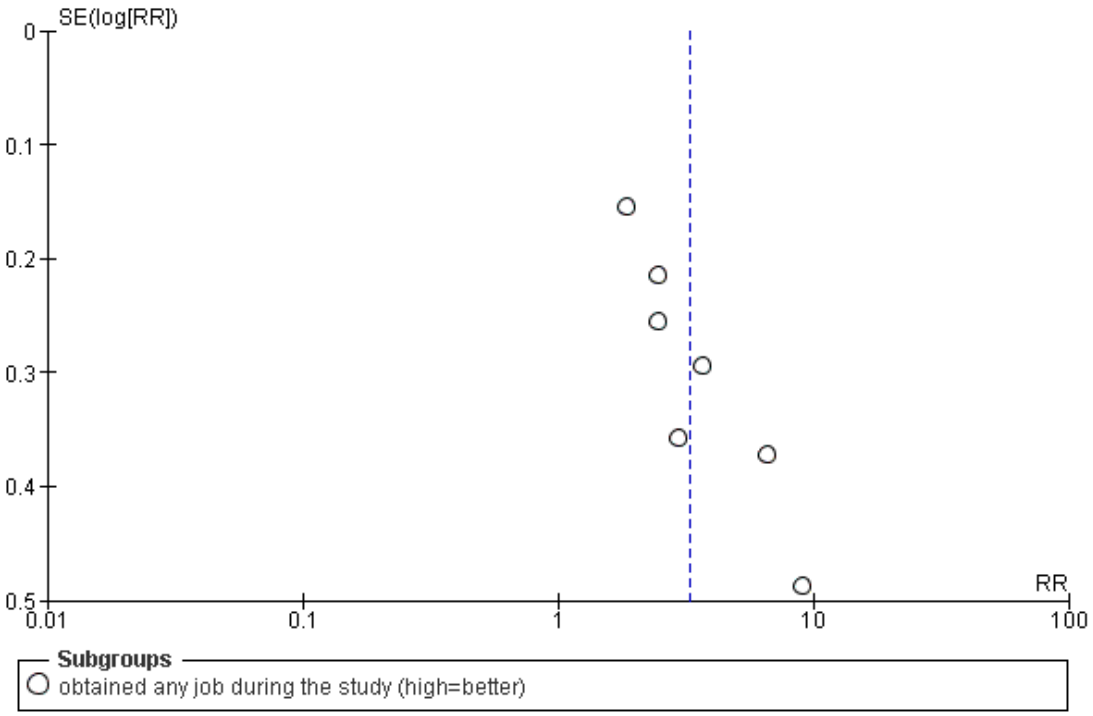
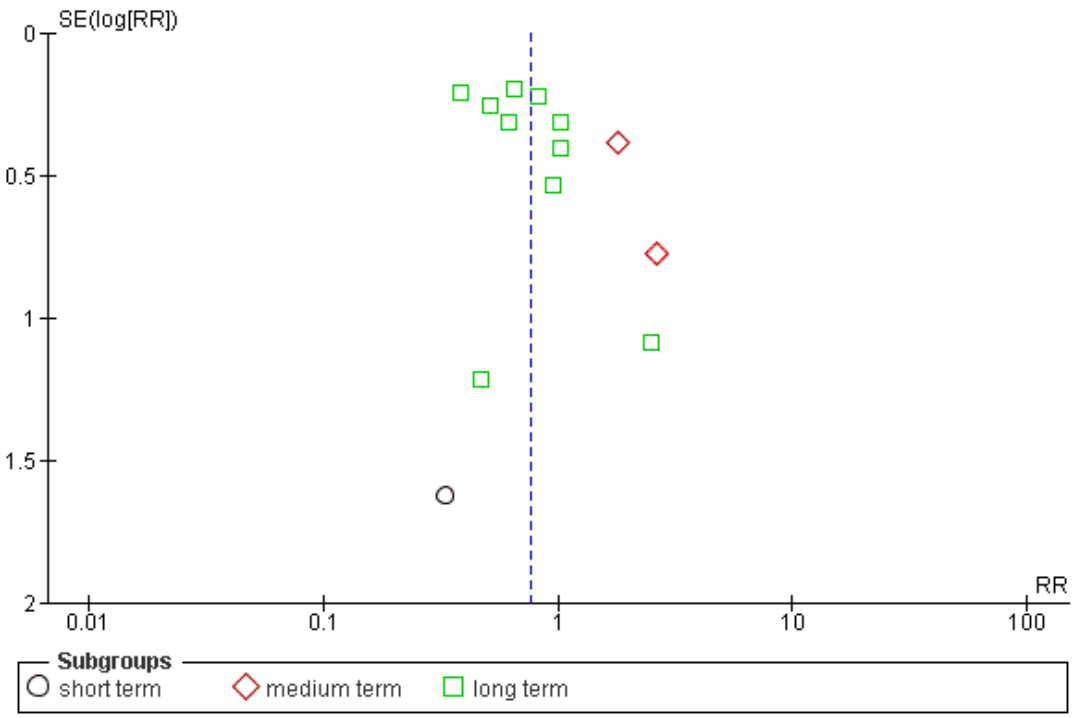


Figure 6. Funnel plot of comparison: 1 Supported employment versus other vocational approaches, outcome: 1.6 Leaving the study early for any reason.



5. Regression Analysis

We did not conduct regression analysis because we did not have a sufficient number of trials for most variables, including the primary outcome.

6. Sensitivity Analysis

6.1 Excluding trials with less than 80% follow-up on the variable at the time point

Results from this sensitivity analysis did not materially change the main findings.

6.2 Excluding skewed data

No data were available for four items with regard to average endpoint specific symptom score (positive and negative symptoms of PANSS, and anxiety and depression of HADS) in this sensitivity analysis. This sensitivity analysis was not performed for the outcomes specified in the protocol 1.1 to 1.5 (days in competitive employment, days in any form of paid employment, earnings in the first year, job tenure, time to first competitive employment) and 10.1 (direct costs) (see Measures of treatment effect), because all included continuous data were skewed in terms of these outcomes. Only studies with more than n = 200 were included in data synthesis, with the remaining studies reported in separate data tables, making it difficult to draw any meaningful conclusions from the data.

6.3 Excluding trials with a high risk of bias or where the overall risk of bias was unclear.

This sensitivity analysis was not performed, because all included trials were with at least one risk of bias.

6.4 Excluding trials where IPS was augmented with other interventions.

Results from this sensitivity analysis did not materially change the main findings.

DISCUSSION

Summary of main results

A total of 14 randomised controlled trials (2265 participants) were included in this review.

COMPARISON 1: Supported employment versus other vocational approaches

In terms of primary outcome, employment: days in competitive employment (long term, i.e. over one year of follow-up), supported employment seems to increase the length of competitive employment when compared with other vocational approaches. However, the vast majority of the data were considerably skewed, making it impossible to draw any meaningful conclusions from these data. However, binary employment outcomes of obtaining competitive employment during the study clearly and significantly favoured supported employment over other vocational approaches.

Supported employment also showed advantage in other secondary outcomes. It seems to increase the length of any form of paid employment and job tenure for competitive employment, and decrease the time to first competitive employment. In terms of job tenure for any paid employment, no statistically significant difference was observed between supported employment and other vocational approaches.

With regard to earnings in the first year, endpoint global state, endpoint specific symptom scores, days in hospital, rate of hospitalisation, endpoint quality of life scores, endpoint global functioning score, death and direct costs, no significant difference was observed between supported employment and other vocational approaches.

COMPARISON 2: subgroup analysis: High fidelity Individual Placement and Support IPS) versus other vocational approaches

Results from this subgroup analysis did not materially change the main findings in COMPARISON 1 except that no data were available for direct costs.

Few data were obtained indicating that fidelity to the IPS model affects the effectiveness of supported employment.

One of the 14 included studies, Tsang 2009 adopted augmented supported employment as an experimental intervention and could contribute to a subgroup analysis including only augmented supported employment (COMPARISON 3: subgroup analysis: Augmented supported employment versus other vocational approaches). However, this subgroup analysis did not prove useful for exploring if the effectiveness of supported employment can be augmented by the addition of other interventions, because the study did not provide data about days in competitive employment (long term) and could not contribute to the primary outcome.

Sensitivity analysis

Results from a sensitivity analysis excluding studies with less than 80% follow-up on the variable at the time point did not materially change the main findings in COMPARISON 1, except that no statistically significant difference was observed in job tenure for competitive employment between supported employment and other vocational approaches.

Overall completeness and applicability of evidence

1. Completeness

1.1 Duration of follow-up

Though the majority of studies presented long-term data, i.e. over one year of follow-up, this might still not be enough to answer or address the critical question about durability of effects.

1.2 Coverage of outcomes

Of the 14 identified studies, 10 (71%) at maximum were able to contribute to any vocational or non-vocational outcome that we had specified in the protocol. For example, eight studies contributed to "Days in any form of paid employment" and seven studies to "Job tenure for any paid employment by weeks," whereas only one study provided data in format we were able to pool for our primary outcome "Days in competitive employment" or five studies for "Average endpoint QOL-life in general". No studies reported data on relapse except average endpoint global state score, and only one or two studies provided data for general functioning or costs. Adverse effects were not reported, except death.

2. Applicability

2.1 Origin

A percentage of 52.9% of the total number of participants included in the review were from USA, while 29.4% were from Europe.The sample also included people from Canada, Australia and China. Given that a large part of the total sample came from North America and Europe, the present review findings are still lacking applicability to developing countries and, more generally, to countries where mental health systems are not community-based.

2.2 People

Variability of participants recruited for trials is likely to reflect the heterogeneity of patients a clinician faces in daily practice when treating people with severe mental illness. This variability was in regard to diagnosis (where participants were affected by a wide diagnostic group including schizophrenic, affective and personality disorder). On average, studies included people with a long history of illness; only Killackey 2008 included participants with a first episode of psychosis. This fits with the concept of severe mental illness, where this label includes certain criteria relating to length of illness.

2.3 Interventions

All the included studies compared supported employment with other vocational approaches and there was no study comparing supported employment with treatment as usual, as defined in the protocol. This would not violate the applicability of the results, because most of current psychiatric services provide at least one type of vocational approach (supported employment or pre-vocational rehabilitations).

Quality of the evidence

The biggest caveat of the current data-set is that only seven out of 14 (50%) of the identified studies contributed to our primary outcome. For secondary outcomes, eight studies (57%) contributed to days in any form of paid employment but for the others typically between two and five studies only were contributory. This represents a substantial risk of outcome reporting bias (Furukawa 2007). In terms of the quality of individual studies, there also appears to exist some overall risk of bias, as illustrated in Figure 2. This would mean, therefore, a moderate risk of overestimation of positive effects in the current systematic review. Future RCTs in this area should attempt to report all clinically important outcomes, preferably in a standardised format, and also to improve quality of study methodology and its reporting.

The following pre-planned subgroup analyses did not fully answer the question explained in the secondary objectives.

(a) High fidelity IPS versus other vocational approaches.

(b) Augmented supported employment versus other vocational approaches.

Future reviews should include comparisons listed below.

(c) High fidelity IPS versus low fidelity IPS.

(d) Augmented supported employment versus supported employment without augmentation.

Potential biases in the review process

The present review is not exempt from some potential biases. We have worked mainly with published reports, and only in few cases with unpublished material. Only a minority of the identified trials contributed to any of the primary or secondary outcomes. This may have lead to a reporting and publishing bias. In several cases, our original protocol was not specific enough and a need for subsequent clarification arose and post hoc decisions had to be taken (see Differences between protocol and review). In some cases this could have affected the review results. Nevertheless, much information would have been lost if we chose to exclude trials where diagnoses of a part of the participants did not fulfil the definition of severe mental illness described in the original protocol.

Agreements and disagreements with other studies or reviews

A previous Cochrane review (Crowther 2001) and another systematic review (Twamley 2003) have examined effectiveness of various types of vocational rehabilitation for individuals with severe mental illness, including supported employment. In addition, there are two narrative reviews (Bond 2004; Bond 2008a). Their results are in line with this review. All the previous reviews indicated that supported employment could improve vocational and non-vocational conditions in this population.

AUTHORS' CONCLUSIONS

Implications for practice

Supported employment was found to be effective in improving a number of outcomes relevant to people with severe mental illness. Indeed, supported employment was shown to increase the likelihood of obtaining any employment and the length of both competitive employment and any form of employment. Furthermore, this type of vocational intervention was indicated to reduce time to first competitive employment and increase job tenure for competitive employment. However, the number of studies contributing to these clinically relevant outcomes was typically around two to five out of the total 14 identified through our systematic literature search. Therefore, whether supported employment is effective for people with severe mental illness is still inconclusive. Data on non-vocational outcomes including mental state, quality of life and costs were very few and difficult to interpret, as were the vast amount of considerably skewed data from the primary outcome of interest.

Implications for research

Studies with longer follow-up should be conducted to answer or address the critical question about durability of effects. These trials should also evaluate additional outcomes, including mental state, quality of life and effect on length of hospital stay, and should report adverse events in a more systemic manner. All the studies

should report a standard set of outcomes that are relevant to the consumers and policy makers.

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REFERENCES

References to studies included in this review

Bond 2007 ***{published data only}***

* Bond GR, Salyers MP, Dincin J, Drake RE, Becker DR, Fraser VV, et al. A randomized controlled trial comparing two vocational models for persons with severe mental illness. *Journal of Consulting and Clinical Psychology* 2007; **75**(6):968–82.

Fraser VV, Jones AM, Frounfelker R, Harding B, Hardin T, Bond GR. VR closure rates for two vocational models. *Psychiatric Rehabilitation Journal* 2008;**31**(4):332–9.

Harding B, Torres-Harding S, Bond GR, Salyers MP, Rollins AL, Hardin T. Factors associated with early attrition from psychosocial rehabilitation programs. *Community Mental Health Journal* 2008;**44**(4):283–8.

Kukla M, Bond GR. The working alliance and employment outcomes for people with severe mental illness enrolled in vocational programs. *Rehabilitation Psychology* 2009;**54**(2): 157–63.

Kukla ME. *The relationship between employment status and non vocational outcomes for persons with severe mental illness enrolled in vocational programs: a longitudinal study [dissertation]*. Indianapolis, Indiana: University of Purdue, 2010.

Burns 2007 ***{published data only}***

Burns T. Increasing access to work for longer term community mental health team clients: the impact of a work-placement training intervention. National Research Register 2001; Vol. 1.

* Burns T, Catty J, Becker T, Drake RE, Fioritti A, Knapp M, et al. EQOLISE Group. The effectiveness of supported employment for people with severe mental illness: a randomised controlled trial. *Lancet* 2007;**370**(9593): 1146–52.

Burns T, Catty J, EQOLISE Group. IPS in Europe: the EQOLISE trial. *Psychiatric Rehabilitation Journal* 2008;**31** (4):313–7.

Burns T, Catty J, White S, Becker T, Koletsi M, Fioritti A, et al. EQOLISE Group. The impact of supported employment and working on clinical and social functioning: Results of an international study of individual placement and support. *Schizophrenia Bulletin* 2009;**35**(5):949–58.

Burns T, White SJ, Catty J, EQOLISE group. Individual placement and support in Europe: the EQOLISE trial. *International Review of Psychiatry* 2008;**20**(6):498–502.

Catty J, Lissouba P, White S, Becker T, Drake RE, Fioritti A, et al. EQOLISE Group. Predictors of employment for people with severe mental illness: results of an international six-centre randomised controlled trial.. *British Journal of Psychiatry* 2008;**192**(3):224–31.

Drake 1996 ***{published data only}***

Becker DR, Drake RE, Bond GR, Xie H, Dain BJ, Harrison K. Job terminations among persons with severe mental illness participating in supported employment. *Community Mental Health Journal* 1998;**34**(1):71–82.

Clark RE. Supported employment and managed care: can they coexist?. *Psychiatric Rehabilitation Journal* 1998;**22**(1): 62–8.

Clark RE, Xie H, Becker DR, Drake RE. Benefits and costs of supported employment from three perspectives. *Journal of Behavioral Health Services & Research* 1998;**25**(1):22–34.

* Drake RE, McHugo GJ, Becker DR, Anthony WA, Clark RE. The New Hampshire study of supported employment for people with severe mental illness. *Journal of Consulting and Clinical Psychology* 1996;**64**(2):391–9.

Mueser KT, Becker DR, Torrey WC, Xie H, Bond GR, Drake RE, et al. Work and non-vocational domains of functioning in persons with severe mental illness: a longitudinal analysis. *Journal of Nervous and Mental Disease* 1997;**185**(7):419–26.

Torrey WC, Mueser KT, McHugo GH, Drake RE. Self-esteem as an outcome measure in studies of vocational rehabilitation for adults with severe mental illness. *Psychiatric Services* 2000;**51**(2):229–33.

Drake 1999 ***{published data only}***

Dixon L, Hoch JS, Clark R, Bebout R, Drake R, McHugo G, Becker D. Cost-effectiveness of two vocational rehabilitation programs for persons with severe mental illness. *Psychiatric Services* 2002;**53**(9):1118–24.

* Drake RE, McHugo GJ, Bebout RR, Becker DR, Harris

M, Bond GR, et al. A randomized clinical trial of supported employment for inner-city patients with severe mental disorders. *Archives of General Psychiatry* 1999;**56**(7):627–33.

Gold 2006 *{published data only}*

Gold JM, Goldberg RW, McNary SW, Dixon LB, Lehman AF. Cognitive correlates of job tenure among patients with severe mental illness. *American Journal of Psychiatry* 2002; **159**(8):1395–402.

* Gold PB, Meisler N, Santos AB, Carnemolla MA, Williams OH, Keleher J. Randomized trial of supported employment integrated with assertive community treatment for rural adults with severe mental illness. *Schizophrenia Bulletin* 2006;**32**(2):378–95.

Meisler N. Rural-based supported employment approaches: results from the South Carolina site of the employment intervention demonstration project. Proceedings of the155th Annual Meeting of the American Psychiatric Association; 2002 May18-23; Philadelphia, PA, USA. 2002.

Howard 2010 *{published data only}*

Heslin M, Howard L, Leese M, McCrone P, Rice C, Jarrett M, et al. Randomized controlled trial of supported employment in England: 2 year follow-up of the supported work and needs (SWAN) study. *World Psychiatry* 2011;**10** (2):132–7.

* Howard LM, Heslin M, Leese M, McCrone P, Rice C, Jarrett M, et al. Supported employment: randomised controlled trial. *British Journal of Psychiatry* 2010;**196**(5): 404–11.

ISRCTN96677673. RCT of individual placement and support (IPS) to improve the occupational outcomes for people with severe mental illness in South London.. http: //www.controlled-trials.com/ISRCTN96677673/SWAN (accessed 06 July 2009).

Thornicroft G. Employment programme for patients with severe mental illness operated by status employment. National Research Register 2004; Vol. 4.

Killackey 2008 *{published data only}*

Killackey E, Jackson HJ, McGorry PD. Vocational intervention in first-episode psychosis: individual placement and support v. treatment as usual. *British Journal of Psychiatry* 2008;**193**(2):114–20.

Latimer 2006 *{published data only}*

Latimer EA, Lecomte T, Becker DR, Drake RE, Duclos I, Piat M, et al. Generalisability of the individual placement and support model of supported employment: results of a Canadian randomised controlled trial. *British Journal of Psychiatry* 2006;**189**:65–73.

Lehman 2002 *{published data only}*

Lehman AF, Goldberg R, Dixon LB, McNary S, Postrado L, Hackman A, et al. Improving employment outcomes for persons with severe mental illnesses. *Archives of General Psychiatry* 2002;**59**(2):165–72.

Macias 2006 *{published data only}*

Macias C, DeCarlo LT, Wang Q, Frey J, Barreira P. Work interest as a predictor of competitive employment: policy implications for psychiatric rehabilitation. *Administration and Policy in Mental Health* 2001;**28**(4):279–97.

* Macias C, Rodican CF, Hargreaves WA, Jones DR, Barreira PJ, Wang Q. Supported employment outcomes of a randomized controlled trial of ACT and clubhouse models. *Psychiatric Services* 2006;**57**(10):1406–15.

Schonebaum AD, Boyd JK, Dudek KJ. A comparison of competitive employment outcomes for the clubhouse and PACT models. *Psychiatric Services* 2006;**57**(10):1416–20.

Mueser 2004 *{published data only}*

Mueser KT, Becker DR, Wolfe R. Supported employment, job preferences, job tenure and satisfaction. *Journal of Mental Health* 2001;**10**(4):411–7.

* Mueser KT, Clark RE, Haines M, Drake RE, McHugo GJ, Bond GR, et al. The Hartford study of supported employment for persons with severe mental illness. *Journal of Consulting and Clinical Psychology* 2004;**72**(3):479–90.

Mueser KT, Essock SM, Haines M, Wolfe R, Xie H. Posttraumatic stress disorder, supported employment, and outcomes in people with severe mental illness. *CNS spectrums* 2004;**9**(12):913–25.

Tsang 2009 *{published data only}*

Tsang HW, Chan A, Wong A, Liberman RP. Vocational outcomes of an integrated supported employment program for individuals with persistent and severe mental illness. *Journal of Behavior Therapy and Experimental Psychiatry* 2009;**40**(2):292–305.

Twamley 2008 *{published data only}*

Twamley EW, Narvaez JM, Becker DR, Bartels SJ, Jeste DV. Supported employment for middle-aged and older people with schizophrenia. *American Journal of Psychiatric Rehabilitation* 2008;**11**(1):76–89.

Wong 2008 *{published data only}*

Wong K, Chiu R, Tang B, Mak D, Liu J, Chiu SN. A randomized controlled trial of a supported employment program for persons with long-term mental illness in Hong Kong. *Psychiatric Services* 2008;**59**(1):84–90.

References to studies excluded from this review

Alverson 1998 *{published data only}*

Alverson H, Vincente E. An ethnographic study of vocational rehabilitation for Puerto Rican Americans with severe mental illness. *Psychiatric Rehabilitation Journal* 1998;**22**:69–72.

Bayer 2008 *{published data only}*

Bayer W, Koster M, Salize HJ, Hohl W, Machleidt W, Wiedl KH, et al. Longer-term effects of inpatient vocational and ergotherapeutic measures on the vocational integration of patients with schizophrenia. *Psychiatrische Praxis* 2008; **35**(4):170–3.

Bell 1993 *{published data only}*

Bell MD, Milstein RM, Lysaker PH. Pay as an incentive in work participation by patients with severe mental illness. *Hospital and Community Psychiatry* 1993;**44**(7):684–6.

Bell 1993b *{published data only}*
Bell MD, Milstein RM, Lysaker PH. Pay and participation in work activity: clinical benefits for clients with schizophrenia. *Psychosocial Rehabilitation Journal* 1993;**17** (2):173–6.

Bell 1995 *{published data only}*
Bell M, Lysaker P. Paid work activity in schizophrenia: program costs offset by costs of rehospitalizations. *Psychosocial Rehabilitation Journal* 1995;**18**(4):25–34.

Bell 1996 *{published data only}*
Bell MD, Lysaker PH, Milstein RM. Clinical benefits of paid work activity in schizophrenia. *Schizophrenia Bulletin* 1996;**22**(1):51–67.

Bell 1997 *{published data only}*
Bell MD, Lysaker PH. Clinical benefits of paid work activity in schizophrenia: 1-year follow-up. *Schizophrenia Bulletin* 1997;**23**(2):317–28.

Bell 2001 *{published data only}*
Bell M, Bryson G, Greig T, Corcoran C, Wexler BE. Neurocognitive enhancement therapy with work therapy: effects on neuropsychological test performance. *Archives of General Psychiatry* 2001;**58**:763–8.

Bell 2001b *{published data only}*
Bell MD. Effects of work activity augmented by cognitive training. CRISP database 2001.

Bell 2002 *{published data only}*
Bell MD, Bryson G, Wexler BE. Remediating working memory in impaired and less-impaired schizophrenia.. Proceedings of the155th Annual Meeting of the American PsychiatricAssociation; 2002 May 18-23; Philadelphia, PA, USA. 2002.

Bell 2003 *{published data only}*
Bell MD, Bryson G, Greig T, Wexler B. Neurocognitive enhancement therapy in schizophrenia: durability of effects on neuropsychological test performance six months after training. Proceedings of the 9th International Congress on Schizophrenia Research; 2003 Mar 29-Apr 2; Colorado Spings, Colorado, USA. 2003.

Bell 2003b *{published data only}*
Bell M, Bryson G, Wexler BE. Cognitive remediation of working memory deficits: durability of training effects in severely impaired and less severely impaired schizophrenia. *Acta Psychiatrica Scandinavica* 2003;**108**:101–9.

Bell 2005 *{published data only}*
Bell MD, Bryson G, Greig TC, Fiszdon JM, Wexler BE. Functional outcomes from a RCT of cognitive training and work therapy: 12 month follow-up. Proceedings of the 20th International Congress on Schizophrenia Research; 2005 Apr 2-6; Savannah, Georgia, USA. 2005.

Bell 2005b *{published data only}*
Bell MD, Bryson GJ, Greig TC, Fiszdon JM, Wexler BE. Neurocognitive enhancement therapy with work therapy: Productivity outcomes at 6- and 12-month follow-ups. *Journal of Rehabilitation Research & Development* 2005;**42** (6):829–38.

Bell 2007 *{published data only}*
NCT00339170. Computer-based cognitive training program to improve productivity and work performance in individuals with schizophrenia. http://clinicaltrials.gov 2007.

Bell 2007b *{published data only}*
NCT00430560. Work activity augmented by cognitive rehabilitation for schizophrenia. http://clinicaltrials.gov 2007.

Bell 2007c *{published data only}*
Bell M, Fiszdon J, Greig T, Wexler B, Bryson G. Neurocognitive enhancement therapy with work therapy in schizophrenia: 6-month follow-up of neuropsychological performance. *Journal of Rehabilitation Research & Development* 2007;**44**(5):761–70.

Bell 2007d *{published data only}*
Bell MD, Greig TC, Zito W, Wexler BW. An RCT of neurocognitive enhancement therapy with supported employment: employment outcomes at 24 months. *Schizophrenia Bulletin* 2007;**33**(2):420–1.

Bell 2008 *{published data only}*
Bell MD, Zito W, Greig T, Wexler BE. Neurocognitive enhancement therapy with vocational services: work outcomes at two-year follow-up. *Schizophrenia Research* 2008;**105**(1-3):18–29.

Bell 2008b *{published data only}*
Bell M, Zito W, Greig T, Wexler BE. Neurocognitive enhancement therapy and competitive employment in schizophrenia: Effects on clients with poor community functioning. *American Journal of Psychiatric Rehabilitation* 2008;**11**:109–22.

Bell 2009 *{published data only}*
NCT00829400. Cognitive training to enhance VA work program outcomes. http://clinicaltrials.gov 2009.

Blankertz 1997 *{published data only}*
Blankertz LE, Keller C. The provision of long-term vocational supports for individuals with severe mental illness. American Sociological Association 1997.

Bond 1986 *{published data only}*
Bond GR, Dincin J. Accelerating entry into transitional employment in a psychosocial rehabilitation agency. *Rehabilitation Psychology* 1986;**31**(3):143–54.

Bond 1995 *{published data only}*
Bond GR, Dietzen LL, McGrew JH, Miller LD. Accelerating entry Into supported employment for persons with severe psychiatric disabilities. *Rehabilitation Psychology* 1995;**40**(2):75–94.

Briggs 1966 *{published data only}*
Briggs PF, Yater AC. Counseling and psychometric signs as determinants in the vocational success of discharged psychiatric patients. *Journal of Clinical Psychology* 1966;**22**: 100–4.

Bryson 2002 *{published data only}*
Bryson G, Lysaker P, Bell M. Quality of life benefits of paid work activity in schizophrenia. *Schizophrenia Bulletin* 2002; **28**(2):249–57.

Bryson 2005 *{published data only}*
Bryson GJ, Bell MD, Greig TC, Wexler BE. Neuropsychological outcomes from a RCT of cognitive training and work therapy: 12 month follow-up. Proceedings of the 20th International Congress on Schizophrenia Research; 2005 Apr 2-6; Savannah, Georgia, USA. 2005.

Buchain 2003 (SE155) *{published data only}*
Buchain PC, Vizzotto AD, Henna Neto J, Elkis H. Randomized controlled trial of occupational therapy in patients with treatment-resistant schizophrenia. *Revista Brasileira de Psiquiatria* 2003;**25**(1):26–30.

Chandler 1996 (SE156) *{published data only}*
Chandler D, Meisel J, McGowen M, Mintz J, Madison K. Client outcomes in two model capitated integrated service agencies. *Psychiatric Services* 1996;**47**(2):175–80.

Chandler 1996 (SE159) *{published data only}*
Chandler D, Meisel J, Hu TW, McGowen M, Madison K. Client outcomes in a three-year controlled study of an integrated service agency model. *Psychiatric Services* 1996; **47**(12):1337–43.

Chandler 1997 (SE157) *{published data only}*
Chandler D, Hu TW, Meisel J, McGowen M, Madison K. Mental health costs, other public costs, and family burden among mental health clients in capitated integrated service agencies. *Journal of Mental Health Administration* 1997;**24** (2):178–88.

Chandler 1997 (SE160) *{published data only}*
Chandler D, Meisel J, Hu T, McGowen M, Madison K. A capitated model for a cross-section of severely mentally ill clients: employment outcomes. *Community Mental Health Journal* 1997;**33**(6):501–16.

Chandler 1998 (SE158) *{published data only}*
Chandler D, Meisel J, Hu T, McGowen M, Madison K. A capitated model for a cross-section of severely mentally ill clients: hospitalization. *Community Mental Health Journal* 1998;**34**(1):13–26.

Collier 2006 *{published data only}*
NCT00333177. Effectiveness of psychosocial therapy plus risperidone treatment improving work or school performance in people with recent-onset schizophrenia. http://clinicaltrials.gov (accessed 6 July 2009).

Cook 2005 *{published data only}*
Cook JA, Leff HS, Blyler CR, Gold PB, Goldberg RW, Mueser KT, et al. Results of a multi site randomized trial of supported employment interventions for individuals with severe mental illness. *Archives of General Psychiatry* 2005;**62** (5):505–12.
* Cook JA, Lehman AF, Drake R, McFarlane WR, Gold PB, Leff HS, et al. Integration of psychiatric and vocational services: a multi site randomized, controlled trial of supported employment. *American Journal of Psychiatry* 2005;**162**(10):1948–56.
Cook JA, Razzano LA, Burke-Miller JK, Blyler CR, Leff HS, Mueser KT, et al. Effects of co-occuring disorders on employment outcomes in a multi site randomized study of supported employment for people with severe mental illness. *Journal of Rehabilitation Research & Development* 2007;**44**(6):837–50.

Davis 2010 *{published data only}*
Davis LL, Drebing C, Parker PE, Leon AC. Occupational recovery in persons with PTSD:? Results from clinical investigations. Proceedings of the International Society of Traumatic Stress Studies; 2010 Nov 3-5 ; Montreal, Quebec. 2010.

Drebing 2007 (SE164) *{published data only}*
Drebing CE, Van Ormer EA, Mueller L, Hebert M, Penk WE, Petry NM, et al. Adding contingency management intervention to vocational rehabilitation: outcomes for dually diagnosed veterans. *Journal of Rehabilitation Research & Development* 2007;**44**(6):851–66.

Gervey unpublished *{published data only}*
Gervey R, Bedell JR. Supported employment in vocational rehabilitation. *Psychological assessment and treatment of persons with severe mental illness*. Washington, DC, USA: Taylor & Francis, 1994:1151–75.
* Gervey RG, Bedell JR, Parrish A. Supported employment versus paid pre-employment training for persons with psychiatric disabilities: A controlled study. Data on file.

Glynn 2005 *{published data only}*
NCT00261716. Motivational interviewing to improve work outcomes in schizophrenia. http://clinicaltrials.gov (accessed 6 July 2009).

Greig 2007 *{published data only}*
Greig TC, Zito W, Wexler BE, Fiszdon J, Bell MD. Improved cognitive function in schizophrenia after one year of cognitive training and vocational services. *Schizophrenia Research* 2007;**96**(1-3):156–61.

Hu 1998 (SE166) *{published data only}*
Hu TW, Jerrell JM. Estimating the cost impact of three case management programmes for treating people with severe mental illness. *British Journal of Psychiatry* 1998;**173**(Suppl 34):26–32.

Jones 2005 (SE143) *{published data only}*
Jones PB. Improving social recovery in early affective and non-affective psychosis: a randomised controlled trial of social recovery orientated cognitive behaviour (SRCBT). National Research Register 2005, issue 3.

Katz 2009 (SE144) *{published data only}*
Katz N, Keren N. Effectiveness of an occupational goal intervention (OGI) in schizophrenia for executive dysfunction and occupational outcomes: a randomized controlled trial.. Proceedings of the World Psychiatric Association International Congress; 2009 April 1-4th; Florence Italy. 2009.

Lysaker 2004 (SE170) *{published data only}*
Lysaker PH, Davis LW. Cognitive-behavioral therapy and work outcome in schizophrenia. Proceedings of the 157th Annual Meeting of the American Psychiatric Association; 2004 May 1-6; NewYork, USA. 2004.

Lysaker 2005 (SE169) *{published data only}*
Lysaker PH, Bond G, Davis LW, Bryson GJ, Bell MD. Enhanced cognitive-behavioral therapy for vocational rehabilitation in schizophrenia: Effects on hope and work. *Journal of Rehabilitation Research & Development* 2005;**42** (5):673–82.

Lysaker 2006 (SE168) *{published data only}*
Lysaker PH, Davis LW, Beattie N. Effects of cognitive behavioral therapy and vocational rehabilitation on meta-cognition and coping in schizophrenia. *Journal of Contemporary Psychotherapy* 2006;**36**(1):25–30.

Lysaker 2009 (SE167) *{published data only}*
Lysaker PH, Davis LW, Bryson GJ, Bell MD. Effects of cognitive behavioral therapy on work outcomes in vocational rehabilitation for participants with schizophrenia spectrum disorders. *Schizophrenia Research* 2009;**107**: 186–91.

Malm 2003 (SE172) *{published data only}*
Malm U, Ivarsson B, Allebeck P, Falloon IR. Integrated care in schizophrenia: a 2-year randomized controlled study of two community-based treatment programs. *Acta Psychiatrica Scandinavica* 2003;**107**(6):415–23.

Mangrum 2006 (SE173) *{published data only}*
Mangrum LF, Spence RT, Lopez M. Integrated versus parallel treatment of co-occurring psychiatric and substance use disorders. *Journal of Substance Abuse Treatment* 2006;**30** (1):79–84.

Marder 2005 (SE145) *{published data only}*
NCT00183625. The effectiveness of supplementing supported employment with behavioral skills training in schizophrenia patients taking risperidone or olanzapine. http://clinicaltrials.gov (accessed 6 July 2009).

McFarlane 2002 (SE175) *{published data only}*
McFarlane WR, Cook W, Balser R, Boyak C, Leavitt R. Effects of fact and an employers consortium on employment in severe mental illness. Proceedings of the 155th Annual Meeting of the American PsychiatricAssociation; 2002 May 18-23; Philadelphia, PA, USA. 2002.

McGurk 2005 (SE18) *{published data only}*
McGurk SR, Mueser KT, Pascaris A. Cognitive training and supported employment for persons with severe mental illness: one-year results from a randomized controlled trial. *Schizophrenia Bulletin* 2005;**31**(4):898–909.

McGurk 2007 (SE19) *{published data only}*
McGurk SR, Mueser KT, Feldman K, Wolfe R, Pascaris A. Cognitive training for supported employment: 2-3 year outcomes of a randomized controlled trial. *American Journal of Psychiatry* 2007;**164**(3):437–41.

McGurk 2009 (SE176) *{published data only}*
McGurk SR, Mueser KT, DeRosa TJ, Wolfe R. Work, recovery, and comorbidity in schizophrenia: a randomized controlled trial of cognitive remediation. *Schizophrenia Bulletin* 2009;**35**(2):319–35.

Mueser 2005 (SE178) *{published data only}*
Mueser KT, Aalto S, Becker DR, Ogden JS, Wolfe RS, Schiavo D, et al. The effectiveness of skills training for improving outcomes in supported employment. *Psychiatric Services* 2005;**56**(10):1254–60.

Mueser 2008 (SE180) *{published data only}*
Mueser KT, Rosenberg SD, Xie H, Jankowski MK, Bolton EE, Lu W, et al. A randomized controlled trial of cognitive-behavioral treatment for posttraumatic stress disorder in severe mental illness. *Journal of Consulting and Clinical Psychology* 2008;**76**(2):259–71.

Mueser u1 (SE179) *{published data only}*
Mueser KT, McGurk SR. 2-3 year outcomes of a randomized controlled trial of cognitive training and supported employment for people with severe mental illness. *Schizophrenia Bulletin* 2007;**33**(2):448–9.

Okpaku 1997 (SE181) *{published data only}*
Okpaku SO, Anderson KH, Sibulkin AE, Butler JS, Bickman L. The effectiveness of a multidisciplinary case management intervention on the employment of SSDI applicants and beneficiaries. *Psychiatric Rehabilitation Journal* 1997;**20**(3):34–41.

Toprac 2002 *{published data only}*
Toprac M, Hoppe SK, Daggett P, Wambach K, OnkenS, Burek S, et al. The Texas earns supported employment demonstration project. Proceedings of the 155th Annual Meeting of the American Psychiatric Association; 2002 May 18-23; Philadelphia, PA, USA. 2002.

References to studies awaiting assessment

McFarlane 2000 *{published data only}*
McFarlane WR, Dushay RA, Deakins SM, Stastny P, Lukens EP, Toran J, et al. Employment outcomes in family-aided assertive community treatment. *American Journal of Orthopsychiatry* 2000;**70**(2):203–14.

Michon 2010 *{published data only}*
ISRCTN87339610. SCION - Study on cost-effectiveness of individual placement and support (IPS regarding open employment in the Netherlands). http://www.controlled-trials.com (accessed 6 July 2009).
Michon H, van Busschbach J, van Vugt M, Stant, Kroon H, Wiersma D, et al. Effectiveness of the Individual Placement and Support (IPS) model of vocational rehabilitation for people with severe mental illnesses in the Netherlands. Psychiatr Prax. 2011; Vol. 38. [DOI: 10.1055/s-0031-1277830]

References to ongoing studies

Bejerholm 2009 (SE142) *{published data only}*
NCT00960024. Supported employment in a Swedish context. http://clinicaltrials.gov (accessed 6 July 2009).

McFarlane 2008 (SE147) *{published data only}*
NCT00531518. Early detection and intervention for the prevention of psychosis, a multi-site study (EDIPP). http://clinicaltrials.gov (accessed 6 July 2009).

Nuechterlein 2008 *{published data only}*
NCT00203788. Antipsychotic therapy plus a behavioral Intervention for improving work outcome in people

with recent-onset schizophrenia. http://clinicaltrials.gov (accessed 06 July 2009).

Nuechterlein KH, Subotnik KL, Turner LR, Ventura J, Becker DR, Drake RE. Individual placement and support for individuals with recent-onset schizophrenia: integrating supported education and supported employment. *Psychiatric Rehabilitation Journal* 2008;**31**(4):340–9.

Nuechterlein KH, Subotnik KL, Ventura J, Gitlin MJ, Green MF, Wallace CJ, et al. Advances in improving and predicting work outcome in recent-onset schizophrenia. Proceedings of the 20th International Congress on Schizophrenia Research; 2005 Apr 2-6; Savannah, Georgia, USA. 2005.

Additional references

Altman 1996

Altman DG, Bland JM. Detecting skewness from summary information. *BMJ* 1996;**313**(7066):1200.

Anthony 1987

Anthony WA, Blanch A. Supported employment for persons who are psychiatrically disabled: an historical and conceptual perspective. *Psychosocial Rehabilitation Journal* 1987;**11**:5–23.

Becker 1994

Becker DR, Drake RE, Knoedler W, Anthony WA. Individual placement and support: A community mental health center approach to vocational rehabilitation. *Community Mental Health Journal* 1994;**30**(2):193–212.

Becker 2001

Becker DR, Drake RE. *A Working Life for People with Severe Mental Illness (Innovations in Practice and Service Delivery with Vulnerable Populations)*. New York: Oxford University Press, 2001.

Bilby 1992

Bilby R. A response to the criticisms of transitional employment. *Psychosocial Rehabilitation Journal* 1992;**18**: 69–82.

Bland 1997

Bland JM, Kerry SM. Statistics notes. Trials randomised in clusters. *BMJ* 1997;**315**(7108):600.

Bond 1991

Bond GR, McDonel EC. Vocational rehabilitation outcomes for persons with psychiatric disabilities: An update. *Journal of Vocational Rehabilitation* 1991;**1**(3):9–20.

Bond 1992

Bond GR. Vocational rehabilitation. In: Lieberman RP editor(s). *Handbook of Psychiatric Rehabilitation*. New York: Macmillan, 1992:244–75.

Bond 1997a

Bond GR, Drake RE, Mueser KT, Becker DR. An update on supported employment for people with severe menial illness. *Psychiatric Services* 1997;**48**(3):335–46.

Bond 1997b

Bond GR, Becker DR, Drake RE, Vogler KM. A fidelity scale for the individual placement and support model of supported employment. *Rehabilitation Counseling Bulletin* 1997;**40**(4):265–84.

Bond 1999

Bond GR, Drake RE, Becker DR, Mueser KT. Effectiveness of psychiatric rehabilitation approaches for employment of people with severe mental illness. *Journal of Disability Policy Studies* 1999;**10**(1):18–52.

Bond 2001

Bond GR, Becker DR, Drake RE, Rapp CA, Meisler N, Lehman AF, et al. Implementing supported employment as an evidence-based practice. *Psychiatric Services* 2001;**52**(3): 313–22.

Bond 2004

Bond GR. Supported employment: evidence for an evidence-based practice. *Rehabilitation Journal* 2004;**27**(4): 345–59.

Bond 2008a

Bond GR, Drake RE, Becker DR. An update on randomized controlled trials of evidence-based supported employment. *Psychiatric Rehabilitation Journal* 2008;**31**(4):280–90.

Bond 2008b

Bond GR, Drake RE. Predictors of competitive employment among patients with schizophrenia. *Current Opinion in Psychiatry* 2008;**21**(4):362–9.

Bond 2008c

Bond GR, McHugo GJ, Becker DR, Rapp CA, Whitley R. Fidelity of supported employment: lessons learned from the national evidence-based practice project. *Psychiatric Rehabilitation Journal* 2008;**31**(4):300–5.

Boutron 2004

Boutron I, Tubach F, Giraudeau B, Ravaud P. Blinding was judged more difficult to achieve and maintain in nonpharmacologic than pharmacologic trials. *Journal of Clinical Epidemiology* 2004;**57**(6):543–50.

Cook 2006

Cook JA. Employment barriers for persons with psychiatric disabilities: update of a report for the president's commission. *Psychiatric Services* 2006;**57**(10):1391–405.

Crowther 2001

Crowther R, Marshall M, Bond G, Huxley P. Vocational rehabilitation for people with severe mental illness. *Cochrane Database of Systematic Reviews* 2001, Issue 2. [DOI: 10.1002/14651858.CD003080]

Divine 1992

Divine GW, Brown JT, Frazier LM. The unit of analysis error in studies about physicians' patient care behavior. *Journal of General Internal Medicine* 1992;**7**(6):623–9.

Donner 2002

Donner A, Klar N. Issues in the meta-analysis of cluster randomized trials. *Statistics in Medicine* 2002;**21**(19): 2971–80.

Drake 2008

Drake RE, Bond GR. The future of supported employment for people with severe mental illness. *Psychiatric Rehabilitation Journal* 2008;**31**:367–76.

Egger 1997
Egger M, Davey SG, Schneider M, Minder C. Bias in meta-analysis detected by a simple, graphical test. *BMJ* 1997;**315** (7109):629–34.

EIDP website
Employment intervention demonstration program (EIDP). http://www.psych.uic.edu/eidp/default.htm (accessed 18 June 2011).

Endicott 1976
Endicott J, Spitzer RL, Fleiss JL, Cohen J. The global assessment scale. A procedure for measuring overall severity of psychiatric disturbance. *Archives of General Psychiatry* 1976;**33**(6):766–71.

Furukawa 2002
Furukawa TA, Guyatt GH, Griffith LE. Can we individualize the 'number needed to treat'? An empirical study of summary effect measures in meta-analyses. *International Journal of Epidemiology* 2002;**31**(1):72–6.

Furukawa 2007
Furukawa TA, Watanabe N, Omori IM, Montori VM, Guyatt GH. Association between unreported outcomes and effect size estimates in Cochrane meta-analyses. *JAMA* 2007;**297**(5):468–70.

Gaite 2000
Gaite L, Vazquez-Barquero JL, Arrizabalaga Arrizabalaga A, Schene AH, Welcher B, Thornicroft G, et al. Quality of life in schizophrenia: development, reliability and internal consistency of the Lancashire quality of life profile-European version. EPSILON Study 8. European psychiatric services: Inputs linked to outcome domains and needs. *British Journal of Psychiatry* 2000;**177**(39):s49–54.

Gulliford 1999
Gulliford MC, Ukoumunne OC, Chinn S. Components of variance and intraclass correlations for the design of community-based surveys and intervention studies: data from the Health Survey for England 1994. *American Journal of Epidemiology* 1999;**149**(9):876–83.

Hatfield 1992
Hatfield B, Huxley P, Mohamad H. Accommodation and employment: A survey into the circumstances and expressed needs of users of mental health services in a northern town. *British Journal of Social Work* 1992;**22**(1):61–73.

Higgins 2003
Higgins JP, Thompson SG, Deeks JJ, Altman DG. Measuring inconsistency in meta-analyses. *BMJ* 2003;**327** (7414):557–60.

Higgins 2011
Higgins JPT, Green S (editors). Cochrane Handbook for Systematic Reviews of Interventions Version 5.1.0 [updated March 2011]. The Cochrane Collaboration, 2011. Available from www.cochrane-handbook.org.

Kay 1987
Kay SR, Fiszbein A, Opler LA. The positive and negative syndrome scale (PANSS) for schizophrenia. *Schizophrenia Bulletin* 1987;**13**(2):261–76.

Keel 1997
Keel JH, Mesibov GB, Woods AV. TEACCH-supported employment program. *Journal of Autism and Developmental Disorders* 1997;**27**(1):3–9.

Lehman 1982
Lehman AF, Ward NC, Linn LS. Chronic mental patients: the quality of life issue. *American Journal of Psychiatry* 1982; **139**(10):1271–6.

Lehman 1995
Lehman AF. Vocational rehabilitation in schizophrenia. *Schizophrenia Bulletin* 1995;**21**(4):645–56.

Marshall 2000
Marshall M, Lockwood A, Bradley C, Adams C, Joy C, Fenton M. Unpublished rating scales: a major source of bias in randomised controlled trials of treatments for schizophrenia. *British Journal of Psychiatry* 2000;**176**: 249–52.

McGurk 2007
McGurk SR, Mueser KT, Feldman K, Wolfe R, Pascaris A. Cognitive training for supported employment: 2-3 year outcomes of a randomized controlled trial. *American Journal of Psychiatry* 2007;**164**(3):437–41.

Mueser 2005
Mueser KT, Aalto S, Becker DR, Ogden JS, Wolfe RS, Schiavo D, et al. The effectiveness of skills training for improving outcomes in supported employment. *Psychiatric Services* 2005;**56**(10):1254–60.

ONS 1998
ONS. *Labour force survey (1997/1998)*. London: Office of National Statistics, 1998.

Overall 1962
Overall JE, Gorham DR. The Brief Psychiatric Rating Scale. *Psychological Reports* 1962;**10**:799–812.

Oxman 1992
Oxman AD, Guyatt GH. A consumer's guide to subgroup analyses. *Annals of Internal Medicine* 1992;**116**(1):78–84.

Raj 2009
Raj M, Farooq S. Interventions for obsessive compulsive symptoms in people with schizophrenia. *Cochrane Database of Systematic Reviews* 2009, Issue 1. [DOI: 10.1002/ 14651858.CD005236]

Rosenheck 2006
Rosenheck R, Leslie D, Keefe R, McEvoy J, Swartz M, Perkins D, et al. CATIE Study Investigators Group. Barriers to employment for people with schizophrenia. *American Journal of Psychiatry* 2006;**163**(3):411–7.

Rutman 1994
Rutman ID. How psychiatric disability expresses itself as a barrier to employment. *Psychosocial Rehabilitation Journal* 1994;**17**(3):15–35.

Schulz 1995
Schulz KF, Chalmers I, Hayes RJ, Altman DG. Empirical evidence of bias. Dimensions of methodological quality associated with estimates of treatment effects in controlled trials. *JAMA* 1995;**273**(5):408–12.

Schünemann 2008
Schünemann HJ, Oxman AD, Vist GE, Higgins JPT, Deeks JJ, Glasziou P, et al. Chapter 12: Interpreting results and drawing conclusions. In: Higgins JPT, Green S editor(s). *Cochrane Handbook for Systematic Reviews of Interventions*. The Cochrane Collaboration, 2008:359–83.

Shepherd 1994
Shepherd G, Murray A, Muijen M. *Relative Values: The Different Views of Users, Family Carers and Professionals on Services for People with Schizophrenia*. London: Sainsbury Centre for Mental Health, 1994.

STATA 2005 [Computer program]
Stata Corp. STATA. Version 8. Stata Corp, 2005.

Stein 1998
Stein LI, Santos AB. *Assertive Community Treatment of Persons with Severe Mental Illness*. New York: Norton, 1998.

Tsang 2007
Tsang HW. *Enhancing employment opportunities of people with mental illness through Integrated supported employment*. Health Services Research Committee Report #S121014, 2007.

Twamley 2003
Twamley EW, Jeste DV, Lehman AF. Vocational rehabilitation in schizophrenia and other psychotic disorders: a literature review and meta-analysis of randomized controlled trials. *Journal of Nervous & Mental Disease* 2003;**191**(8):515–23.

Ukoumunne 1999
Ukoumunne OC, Gulliford MC, Chinn S, Sterne JA, Burney PG. Methods for evaluating area-wide and organisation-based interventions in health and health care: a systematic review. *Health Technology Assessment* 1999;**3**(5): iii–92.

Wallace 2004
Wallace CJ, Tauber R. Supplementing supported employment with workplace skills training. *Psychiatric Services* 2004;**55**(5):513–5.

Walsh 1994
Walsh PN, Lynch C, DeLacey E. Supported employment for Irish adults with intellectual disability: The open road experience. *International Journal of Rehabilitation Research* 1994;**17**(1):15–24.

Wehman 2003
Wehman P, Kregel J, Keyser-Marcus L, Sherron-Targett P, Campbell L, West M, et al. Supported employment for persons with traumatic brain injury: a preliminary investigation of long-term follow-up costs and program efficiency. *Archives of Physical Medicine and Rehabilitation* 2003;**84**(2):192–6.

Xia 2007
Xia J, Adams CE, Bhagat N, Bhagat V, Bhoopathi P, El-Sayeh H, Pinfold V, Takriti Y. The Leeds Outcomes Stakeholders Survey (LOSS) Study. Proceedings of the 15th Cochrane Colloquium; Oct 23-27; Sao Paulo. 2007.

Zigmond 1983
Zigmond AS, Snaith RP. The hospital anxiety and depression scale. *Acta Psychiatrica Scandinavica* 1983;**67**(6): 361–70.

* *Indicates the major publication for the study*

CHARACTERISTICS OF STUDIES

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

Bond 2007

Methods	Allocation: randomised. Design: multi-centre. Duration: 24 months. Country: Chicago, Illinois, USA.
Participants	Diagnosis: severe mental illness (37.6% schizophrenia, 16.5% schizoaffective disorder, 23.2% bipolar disorder) according to DSM-IV N=200 originally randomised. Setting: Thresholds, psychiatric rehabilitation service. Age: 18 years or older, mean 38.8 years. Sex: 122 M, 72 F. Ethnicity: 54.3% African American, 6.5% Hispanic, 35.9% white, 3.3% other History: mean number of competitive jobs in past five years IPS 1.52±1.61, DPA 1. 74±1.69 Included: admission to Thresholds North or Thresholds South day program; severely mentally ill according to State of Illinios criteria; at least 18 years of age; expressed goal of paid employment; attendance at two research information groups; Thresholds membership for a minimum of 30 days; no competitive employment in past 30 days; willingness to give informed consent; no PDA services in last 3 months Excluded: physical illness that would likely prevent participation throughout course of full two years of the study Consent: obtained informed consent.
Interventions	1. Individual placement and support, n = 100. 2. Diversified placement approach, n = 100.
Outcomes	Days in competitive employment (long term). Earnings over 2 year study period (USD $) (long term). Days in any form of paid employment. Time to first competitive job. Job stability (average weeks per job). PANSS endpoint score. Unable to use - Satisfaction with vocational services (non-peer-reviewed scale used)
Notes	High fidelity of IPS was assured using the IPS scale.

Risk of bias

Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	Low risk	Randomisation was achieved by means of a computerised randomisation list. Probably done

Bond 2007 (*Continued*)

Allocation concealment (selection bias)	Low risk	After the baseline interview was completed, the interviewer called the offsite project director to report the new participant's identification number, program location (North or South), and work history (experienced/inexperienced). The project director responded with study condition as determined by an a priori computerised randomisation list prepared for each work history level within site. Probably done
Blinding (performance bias and detection bias) All outcomes	High risk	Participants could identify the given intervention by contents of the program. Interviewers not blind to assignment
Incomplete outcome data (attrition bias) All outcomes	High risk	Number of lost to follow-up reported, but no reasons for missing data provided. Among n = 200 randomised, n = 6 were dropped administratively after randomisation as they were subsequently found to be ineligible for study, with a total of n = 194 left. A further n = 4 from IPS and n = 3 from DPA were lost to follow-up, with a total of n = 187 (94%) providing data. Out of n = 194, n = 51 dropped-out within first 10 days, with n = 82 remaining in IPS and n = 65 in the DPA group (27% lost) (LOCF)
Selective reporting (reporting bias)	Low risk	All listed outcomes reported.
Other bias	Unclear risk	Funding: supported by Grant R01MH59987 from the National Institute of Mental Health; participants were paid between $5 to $15 for each interview depending on length

Burns 2007

Methods	Allocation: randomised. Design: multi-centre. Duration: 18 months. Country: London (UK), ULM-Guenzburg (Germany), Rimini (Italy), Zurich (Switzerland), Groningen (Netherlands), Sofia (Bulgaria)
Participants	Diagnosis: severe mental illness (81% schizophrenia/schizoaffective disorder, 17% bipolar disorder) according to OPCRIT N=312. Setting: community.

	Age: 18-65 years, mean 37.8 years. Sex: 188 M, 124 F. Ethnicity: no description. History: 'ill and had major role dysfunction for at least 2 years' Included: diagnosis of severe mental illness; living in the community at baseline; had not been in competitive employment in preceding year and wished to enter competitive employment Excluded: not described. Consent: not described.
Interventions	1. Individual placement and support, n = 156. 2. Vocational services: high quality vocational rehabilitation according to the train-and-place model, n = 156
Outcomes	Days in any form of paid employment. Mental state (PANSS; HADS anxiety and depression). Leaving the study early for any reason. Number of participants admitted to hospital. Death - natural and suicide. Hospitalisation. Quality of life (LQoLP-EU). Global assessment of functioning (GAF-S). Unable to use - Job stability (job tenure) (more than 50% data unaccounted for)
Notes	High fidelity of IPS was assured using the IPS scale.

Risk of bias

Bias	**Authors' judgement**	**Support for judgement**
Random sequence generation (selection bias)	Low risk	Randomisation was done centrally with MINIM. Probably done.
Allocation concealment (selection bias)	Low risk	The allocation sequence was concealed until the services had been assigned
Blinding (performance bias and detection bias) All outcomes	High risk	Participants could identify the given intervention by contents of the program
Incomplete outcome data (attrition bias) All outcomes	Low risk	Total of 81% completed the study to final follow-up; n = 24 dropped-out of IPS group (n = 21 refused interview, n = 3 died 'of natural causes'); n = 38 dropped-out of VS group (n = 21 between assessment and service uptake, n = 15 before being assessed, no reasons provided; n = 2 died, 'from natural causes'). All follow-up participants re-

Burns 2007 (*Continued*)

		ceiving IPS were treated; in follow-up participants in VS group, n = 93 were treated and n = 27 were not treated. The study conducted ITT
Selective reporting (reporting bias)	Low risk	All listed outcomes reported.
Other bias	Low risk	Funding: quote, "The sponsor of the study had no role in study design, data collection, data analysis, data interpretation, or writing of the report. The corresponding author had full access to all the data in the study and had final responsibility for the decision to submit for publication." (p1149)

Drake 1996

Methods	Allocation: randomised. Design: multi-centre. Duration: 18 months. Country: New Hampshire, USA.
Participants	Diagnosis: severe mental illness according to DSM-III-R (schizophrenia and related psychotic disorders, 46.9%; bipolar disorder and other severe mood disorders, 42.7%; and other disorders - primarily severe personality disorders - 10.5%) N=143. Setting: mental health centres. Age: 20-65 years, mean 37.0 years. Sex: 69 M, 74 F. Ethnicity: 95.1% white. History: nearly all were on prescribed medications; current levels of psychiatric symptoms and of alcohol and drug use were low; many had histories of hospitalisation, homelessness, or incarceration during the previous year Included: major mental illness with major role dysfunction of at least 2 years duration; clinical stability (i.e., out of the hospital) for at least 1 month; local residence for at least 6 months; aged between 20 and 65; unemployment for at least 1 month; interest in competitive employment Excluded: significant memory impairment, medical illness, or substance dependence that would preclude participating in a training program Consent: informed consent obtained.
Interventions	1. Individual placement and support, n = 74. 2. Group skills training, n = 69.
Outcomes	Days in any form of paid employment. Obtained competitive employment. Earnings from paid employment. Leaving the study early. Unable to use -

	BPRS (no means or SD reported). GAS (no means or SD reported). Quality of life (QOLI) (no means or SD reported).
Notes	Implementation of IPS was monitored by the procedure described in the paper

Risk of bias

Bias	**Authors' judgement**	**Support for judgement**
Random sequence generation (selection bias)	Unclear risk	Randomised: quote, "stratified on the extent of previous employment" (p394)
Allocation concealment (selection bias)	Unclear risk	No details.
Blinding (performance bias and detection bias) All outcomes	High risk	Participants could identify the given intervention by contents of the program
Incomplete outcome data (attrition bias) All outcomes	High risk	Number and reason for attrition reported: data were obtained for 140 of 143 participants, with reasons for drop-out including n = 1 drop-out after baseline interview; n = 1 death of cancer after 7 months; n = 1 drop-out after 12 months of study (IPS loss n = 1; GST loss n = 2). Data for n = 133 only available for 18 month outcomes of mean hours worked and mean earnings
Selective reporting (reporting bias)	Low risk	All listed outcomes reported.
Other bias	Low risk	Funding: supported by U.S. Public Health Services Grant MH00839 from the National Institute of Mental Health and Grant MH47650 from the National Institute of Mental Health and the Substance Abuse and Mental Health Services Administration and by the New Hampshire Divisions of Mental Health and Vocational Rehabilitation, the Mental Health Center of Greater Manchester, the Central New Hampshire Community Mental Health Services, and the Employment Connection Specialists

Drake 1999

Methods	Allocation: randomised. Design: single centre. Duration: 18 months. Country: inner-city of the District of Clumbia, USA.
Participants	Diagnosis: severe mental illness according to DSM-III-R (schizophrenia n = 102; bipolar n = 21; depressive disorders n = 25; other Axis I disorder n = 4) N=152. Setting: community mental health service. Age: mean 39.4 years. Sex: 59 M, 93 F. Ethnicity: 83.6% African American. History: at least two years of role dysfunction. Included: severe mental disorder; interested in competitive employment Excluded: memory impairment or 'medical illness'. Consent: informed consent obtained.
Interventions	1. Individual placement and support, n = 76. 2. Enhanced vocational rehabilitation, n = 76.
Outcomes	Days in competitive employment (long term). Earnings from paid employment ($). Time to first competitive employment. Average endpoint global state (GAS). Average endpoint specific symptom score (BPRS). Average endpoint quality of life interview score (QOLI). Average endpoint specific aspects of quality of life score. Unable to use - Leaving the study for any reason (losses not divided by group)
Notes	High fidelity of IPS was assured using the IPS scale.

Risk of bias

Bias	**Authors' judgement**	**Support for judgement**
Random sequence generation (selection bias)	Low risk	Randomisation was achieved by means of computer-generated random numbers; stratified according to work history. Probably done
Allocation concealment (selection bias)	Unclear risk	No details.
Blinding (performance bias and detection bias) All outcomes	High risk	Participants could identify the given intervention by contents of the program
Incomplete outcome data (attrition bias) All outcomes	Unclear risk	Complete vocational data obtained for n = 150. Number of lost to follow-up reported,

Drake 1999 (*Continued*)

		but no reasons for missing data provided
Selective reporting (reporting bias)	Low risk	All listed outcomes of interest reported.
Other bias	Low risk	Funding: supported by grant MH51346 from Substance Abuse and Mental Health Services Administration and the National Institute of Mental Health, Washington DC; and grant MH00839 from National Institute of Mental Health

Gold 2006

Methods	Allocation: randomised. Design: single centre. Duration: 24 months. Country: South Carolina, USA.
Participants	Diagnosis:severe mental illness (68.5% schizophrenia spectrum disorder) according to the Federal Centre for Mental Health Services' criteria for severe and persistent mental illness N=177 [n = 143 relevant]. Setting: community psychiatric service. Age: 18 years or older, mean not presented. Sex: 54 M, 89 F. Ethnicity: 76.9% African American, 18.9% white, 4.2% other. History: not stated. Included: meeting Federal Centre for Mental Health Services criteria for severe and persistent mental illness; 18 years old or older; unemployed at study entry; current and/ or future interest in competitive employment; Excluded: not stated. Consent: written voluntary consent obtained.
Interventions	1. ACT-IPS program (27 participants began in the ACT-IVR (integrated vocational rehabilitation) program but transferred to the ACT-IPS program. Both ACT-IPS and ACT-IVR programs integrate supported employment.), n = 66 2. Traditional vocational rehabilitation, n = 77. [3. IPS, n = 34 - project re-design lead to participants finishing early and returning to Center for Mental Health Services - not included in analysis]
Outcomes	Days in competitive employment (long term). Days in any form of paid employment (long term). Job tenure for competitive employment. Job tenure for any paid employment. Time to first competitive employment. Leaving the study early for any reason. Number of participants admitted to hospital/ re-hospitalised Obtained competitive employment.

Gold 2006 (*Continued*)

Notes	High fidelity of IPS was assured using the IPS scale.

Risk of bias

Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	Low risk	SAS-generated restricted random assignment sequence was used (permuted blocks of 3)
Allocation concealment (selection bias)	Low risk	No investigator was permitted to access to the assignment sequence
Blinding (performance bias and detection bias) All outcomes	High risk	Participants could identify the given intervention by contents of the program
Incomplete outcome data (attrition bias) All outcomes	Low risk	N=108 (61%) completed study. Last observation carried forward used
Selective reporting (reporting bias)	Low risk	All listed outcomes reported.
Other bias	High risk	Project redesign and deviation from a prespecified random assignment process may have compromised study internal validity and program construct validity

Howard 2010

Methods	Allocation: randomised. Design: multi-centre. Duration: 24 months. Country: South London, UK.
Participants	Diagnosis:severe mental illness according to ICD-10 (using SCAN) N=219. Setting: community mental health service. Age: mean 38.3 years. Sex: 157 M, 62 F. Ethnicity: 37.4% white, 42.9% black, 18.7% other. History: duration of illness over two years, GAF score of 60 or less and diagnosis of psychotic or chronic affective disorder Included: receiving outpatient or community psychiatric care from local mental health services; severe mental illness; aged between 18-65; able to read and speak English to high enough standard to provide written informed consent; unemployed for at least 3 months and want to obtain competitive employment Excluded: referred to for IPS in previous six months. Consent: written informed consent obtained.

Interventions	1. Individual placement and support, n = 109. 2. Control condition consisting of existing psychosocial rehabilitation and day care programmes available in the local area, n = 110
Outcomes	Leaving the study early for any reason. Average endpoint quality of life score (Manchester Short Assessment version 2) Average endpoint global assessment of functioning score (GAF) Direct cost (GBP £).
Notes	High fidelity of IPS was assured using the IPS scale. Detailed description in the article (cited below) indicated the low fidelity of IPS conducted in the RCT (low rate of engagement): "Of the 109 patients in the intervention arm, 73 (67%) engaged with staff (i.e. had at least one direct contact with an employment consultant); of these individuals, the mean number of contacts with or on behalf of clients was 14 (SD = 10)."

Risk of bias

Bias	**Authors' judgement**	**Support for judgement**
Random sequence generation (selection bias)	Low risk	Randomised: stratified by gender and age (10-year bands); randomisation by minimisation performed by Institute of Psychiatry Mental Health and Neuroscience Clinical Trials Unit
Allocation concealment (selection bias)	Low risk	Probably done. Randomisation with minimisation was used, performed by the Institute of Psychiatry Mental Health and Neuroscience Clinical Trials Unit, a unit independent of the study to maintain concealment
Blinding (performance bias and detection bias) All outcomes	High risk	Participants could identify the given intervention by contents of the program
Incomplete outcome data (attrition bias) All outcomes	High risk	N=11 in each group lost to follow-up and excluded from analysis; in the intervention group, n = 9 were withdrawn, n = 1 was out of the country, n = 1 unable to find. In the control group n = 8 were withdrawn, n = 2 were out of the country, and n = 1 unable to find. Total N=197/219 included in analysis
Selective reporting (reporting bias)	Low risk	All listed outcomes of interest reported.

Other bias	Low risk	Funding: study supported by the Wellcome Trust (GR071272MA); the supported employment programme was funded partly by the King's Fund and the South London and Maudsley Charitable Trust

Killackey 2008

Methods	Allocation: randomised. Design: single centre. Duration: 6 months. Country: Melbourne, Australia.
Participants	Diagnosis: first episode psychosis; schizophrenia-spectrum disorders according to DSM-IV-TR N=41 Setting: Early Psychosis Prevention and Intervention Centre (EPPIC) Age: mean 21.4 years. Sex: 33 M, 8 F Ethnicity: no description. History: no description Included: unemployed looking for work or employed seeking different work; at least six months of care left at EPPIC Excluded: lack of fluency in English. Consent: informed consent obtained.
Interventions	1. Individual placement and support + treatment as usual, n = 20 2. Treatment as usual; EPPIC care consisting of individual case management and medical review, referral to external vocational agencies, as well as involvement with the group programme at EPPIC, which may involve participation in the vocationally oriented groups within the group programme, n = 21
Outcomes	Days in any form of paid employment. Leaving the study early for any reason. Earnings from paid employment. Obtained employment.
Notes	High fidelity of IPS was assured using the IPS scale.

Risk of bias

Bias	**Authors' judgement**	**Support for judgement**
Random sequence generation (selection bias)	Low risk	Randomisation was done using computer-generated random numbers by statistician independent of the study

Killackey 2008 (*Continued*)

Allocation concealment (selection bias)	Low risk	The statistician was contacted by the leader of the project when a new participant enrolled and the statistician informed the leader of the group allocation. Probably done
Blinding (performance bias and detection bias) All outcomes	High risk	Information about group allocation was given to each participant and his/her case managers. The research assistant was not involved in the randomisation process, but there were no formal tests of her masking to allocation
Incomplete outcome data (attrition bias) All outcomes	Low risk	One person from the intervention group and n = 5 from the treatment as usual (TAU) group dropped-out. Reasons included n = 4 from TAU felt that the intervention was not helping them obtain work; the other n = 2 (one from each group) were sent to prison for offences committed before study recruitment. All participants gave permission for follow-up to be determined by their case manager and medical records - the study conducted ITT analysis
Selective reporting (reporting bias)	Low risk	All listed outcomes reported.
Other bias	Unclear risk	Funding: supported by National Health and Medical Research Council Program Grant 350241 and an unrestricted study grant from Bristol Myers Squibb

Latimer 2006

Methods	Allocation: randomised. Design: single centre. Duration: 12 months. Country: MontrÃÃ©al, Canada.
Participants	Diagnosis: schizophrenia-spectrum disorder, bipolar disorder and major depression according to DSM-IV N=150. Setting: the Douglas Hospital, a teaching psychiatric hospital (Canada) Age: 18-64 years, mean 40.3 years. Sex: 93 M, 57 F. Ethnicity: 81.9% white. History: no description. Included: previous attendance of two introductory meetings; interest in working; be-

	tween 18-64 years of age; diagnosis of schizophrenia spectrum disorder; if diagnosed with depression to be classified as disabled due to mental illness by provincial welfare system; unemployed at the time of signing consent Excluded: learning disability (IQ<70); physical or organic disability that seriously impedes work; did not have a case manager willing to see them at least once a month Consent: informed consent required.
Interventions	1. Individual placement and support, n = 75. 2. Usual vocational services, n = 75.
Outcomes	Days in competitive employment (long term). Days in any form of paid employment. Earnings in the first 1 year. Job stability (average weeks per job for competitive employment and any form of paid employment) Time to first competitive employment. Leaving the study early.
Notes	High fidelity of IPS was assured using the IPS scale.

Risk of bias

Bias	**Authors' judgement**	**Support for judgement**
Random sequence generation (selection bias)	Low risk	Randomised: stratified by work history and clinical site. The biostatistician generated 16 random assignment sequences. Probably done
Allocation concealment (selection bias)	Low risk	The project coordinator prepared an opaque envelope containing the assignment and gave it to the interviewer before the baseline interview
Blinding (performance bias and detection bias) All outcomes	High risk	Assignment was revealed (to both interviewer and participant) at the conclusion of the baseline interview
Incomplete outcome data (attrition bias) All outcomes	Low risk	Number and reason for attrition reported, with n = 9 lost to follow-up in the usual service group, and n = 16 lost in the supported employment group. Intention to treat analysis used
Selective reporting (reporting bias)	Low risk	All listed outcomes reported.
Other bias	Unclear risk	Funding: Canadian Institutes of Health Research, Quebec Health Research Fund and AETMIS

Lehman 2002

Methods	Allocation: randomised. Design: single centre. Duration: 24 months. Country: Baltimore, USA.
Participants	Diagnosis: severe mental illness (74.0% psychotic disorders) according to DSM-IV N=219. Setting: a university-run community psychiatric service. Age: 18 years or older, mean 41.5 years. Sex: 124 M, 95 F. Ethnicity: 75% African American or other minority, 25% white History: ≥2 prior psychiatric hospitalizations of 21 days within the prior 3 years; total of at least 42 days before a current hospitalisation; or 90 total days in a psychiatric hospital or nursing home within the past 3 years Included: receiving Supplemental Security Income, Social Security Disability Income, 100% Veterans Affairs disability benefits because of mental disorder; diagnosis in the schizophrenia spectrum using DSM-IV or another Axis I disorder or extensive hospitalisation history Excluded: not stated. Consent: standard written informed consent obtained.
Interventions	1. Individual placement and support, n = 113. 2. Psychosocial rehabilitation programs, n = 106.
Outcomes	Job stability (tenure). Leaving the study early. Obtained employment. Time to first employment (for those who obtained employment) Wage (per-hour, USD $).
Notes	High fidelity of IPS was assured using the IPS scale.

Risk of bias

Bias	**Authors' judgement**	**Support for judgement**
Random sequence generation (selection bias)	Unclear risk	Randomised using pre-prepared sealed envelopes.
Allocation concealment (selection bias)	Low risk	Using pre-prepared sealed envelopes.
Blinding (performance bias and detection bias) All outcomes	High risk	Participants could identify the given intervention by contents of the program
Incomplete outcome data (attrition bias) All outcomes	Unclear risk	N=148 (68%) completed study.

Lehman 2002 (*Continued*)

Selective reporting (reporting bias)	Low risk	All listed outcomes reported.
Other bias	Unclear risk	Funding: study was supported by cooperative grant UD7-SM51824 from the Center for Mental Health Services, Substance Abuse and Mental Health Services Administration, Department of Health and Human Services, Rockville, Md, as part of the Employment Intervention Demonstration Project; grant P50-MH4370 from the National Institute of Mental Health, Rockville; and the Mental Illness Research Education and Clinical Center, Veterans Affairs Integrated Service Network 5, Baltimore, Md Participants received $20 for baseline interviews, $10 for each of next two follow-up interviews and $15 for the 18 and 24 month interviews

Macias 2006

Methods	Allocation: randomised. Design: single centre. Duration: 24 months. Country: Massachusetts, USA.
Participants	Diagnosis: severe mental illness (at least 50.8% schizophrenia) according to DSM-IV N=177. Setting: community psychiatric service. Age: 18 years or older, mean 38.1 years. Sex: 96 M, 79 F, 3 unknown. Ethnicity: 84% Caucasian; 8% African American; 6% Hispanic; 2% Asian or Native American History: no description. Included: at least 18 years of age; clinician diagnosis of severe mental illness; currently unemployed Excluded: 'severe mental retardation'. Consent: not stated.
Interventions	1. Assertive community treatment: including supported employment, n = 88 2. Clubhouse model: including supported employment, n = 89.
Outcomes	Job stability (tenure for any form of paid employment). Leaving the study early. Earnings from paid employment (USD $).
Notes	Fidelity of supported employment was verified annually by Drs. Frey and Bond

Macias 2006 (*Continued*)

Risk of bias		
Bias	**Authors' judgement**	**Support for judgement**
Random sequence generation (selection bias)	Unclear risk	Participants were randomly assigned to one of the two conditions by picking a card from a hat
Allocation concealment (selection bias)	Unclear risk	No details.
Blinding (performance bias and detection bias) All outcomes	High risk	Participants could identify the given intervention by contents of the program
Incomplete outcome data (attrition bias) All outcomes	High risk	N=121 (68%) completed the study (n = 25 from ACT; n = 31 from Clubhouse) - reasons not described
Selective reporting (reporting bias)	Low risk	All listed outcomes reported.
Other bias	Unclear risk	Funding: grant SM-51831 from the Substance Abuse and Mental Health Service Administration. Data analysis was supported from 2001 to 2006 by interdisciplinary research grant from the National Institute of Mental Health (NIMH)

Mueser 2004

Methods	Allocation: randomised. Design: single centre. Duration: 24 months. Country: Connecticut, USA.
Participants	Diagnosis:severe mental illness (53.4% schizophrenia, 21.1% schizoaffective, 4.9% bipolar) according to DSM-IV N=204. Setting: community psychiatric service. Age: 18 years or older, mean 41.2 years. Sex: 126 M, 78 F. Ethnicity: 44.6% African American, 31.4% Hispanic, 21.1% Caucasian non-Hispanic, 3.0% other History: not stated. Included: severe mental illness under DSM-IV; lack of competitive employment; desire for competitive work; attendance at two introductory meetings; willingness and capability to provide consent and participate in the study Excluded: not stated. Consent: written informed consent required.

Interventions	1. Individual placement and support, n = 68*. 2. Standard services including supported employment, n = 69* 3. Psychosocial intervention, n = 67. *For purposes of meta-analysis, data from study arms 1 and 2 were combined, for n = 137
Outcomes	Days in competitive employment (long term). Days in any form of paid employment. Job stability (average weeks per job for competitive employment and for any form of paid employment) Time to first competitive employment. Leaving the study early for any reason.
Notes	High fidelity of IPS was assured using the IPS scale.

Risk of bias

Bias	**Authors' judgement**	**Support for judgement**
Random sequence generation (selection bias)	Low risk	A computer-generated randomisation list was used.
Allocation concealment (selection bias)	Unclear risk	No details.
Blinding (performance bias and detection bias) All outcomes	High risk	Participants could identify the given intervention by contents of the program
Incomplete outcome data (attrition bias) All outcomes	Low risk	N=6 participants were lost to follow-up; n = 3 IPS; n = 2 standard services; n = 1 PSR. Intention to treat analysis performed. N= 166 (81%) completed the 24-month interview; last observation carried forward
Selective reporting (reporting bias)	Low risk	All listed outcomes reported.
Other bias	Unclear risk	Funding: supported by cooperative #UD7 SM51818 from the U.S. Department of Health and Human Services (DHHS) Substance Abuse and Mental Health Services Administration (SAMHSA) Center for Mental Health Services (CMHS) as part of the Employment Intervention Demonstration Program (EIDP). Additional support provided by National Institute of Mental Health (NIMH) Grants MH00842 and MH56147

Tsang 2009

Methods	Allocation: randomised. Design: single centre. Duration: 15 months. Country: Hong Kong, China.
Participants	Diagnosis: severe mental illness according to DSM-IV. N=163. Setting: community mental health programs. Age: mean 34.6 years. Sex: 81 M, 82 F. Ethnicity: No description given. History: not stated. Included: severe mental illness; unemployed; willing and cognitively competent to give informed consent; completed primary education; expressing desire to work Excluded: obvious cognitive, learning and neurological impairments determined by mental status exam Consent: written informed consent required.
Interventions	1. Integrated supported employment (augmented supported employment), n = 52 2. Individual placement and support, n = 56. 3. Traditional vocational rehabilitation, n = 55.
Outcomes	Job stability (job tenure). Leaving the study early. Obtained competitive employment.
Notes	High fidelity of IPS was assured using the IPS scale.

Risk of bias

Bias	**Authors' judgement**	**Support for judgement**
Random sequence generation (selection bias)	Low risk	Randomised using SPSS.
Allocation concealment (selection bias)	Unclear risk	No details.
Blinding (performance bias and detection bias) All outcomes	High risk	Participants could identify the given intervention by contents of the program
Incomplete outcome data (attrition bias) All outcomes	Unclear risk	N=127 (77.9%) completed the 15-month intervention; n = 43/52 completed ISE; n = 41/56 completed IPS; n = 43/55 completed TVR. Unclear whether ITT used
Selective reporting (reporting bias)	Low risk	All listed outcomes reported.

Tsang 2009 (*Continued*)

Other bias	Unclear risk	Funding: study was funded by the Health Services Research Fund, Health, Welfare and Food Bureau, HKSAR (HSRF Project No.: S121014)

Twamley 2008

Methods	Allocation: randomised. Design: single centre Duration: 12 months. Country: San Diego, USA.
Participants	Diagnosis: schizophrenia or schizoaffective disorder according to DSM-IV (n = 20 schizophrenia; n = 30 schizoaffective disorder) N=50. Setting: psychiatric outpatient clinic. Age:45 years or over, mean 50.5 years. Sex: 30 M, 20 F. Ethnicity: 36% "minority". History: receiving treatment at an outpatient clinic in San Diego; all participants had previously worked with 84% with his Included: unemployed with express desire to work at the time of study; 84% history of consecutive employment for at least 12 months Excluded: alcohol/substance dependence within past month; dementia or other neurological disorders Consent: written informed consent obtained.
Interventions	1. Individual placement and support, n = 28. 2. Conventional vocational rehabilitation, n = 22.
Outcomes	Days in competitive employment (long term). Days in any form of paid employment. Time to first competitive employment. Leaving the study early for any reason. Average endpoint quality of life score (quality of life interview global satisfaction index)
Notes	High fidelity of IPS was assured using the IPS scale.

Risk of bias

Bias	**Authors' judgement**	**Support for judgement**
Random sequence generation (selection bias)	Unclear risk	Randomised. No further details.
Allocation concealment (selection bias)	Unclear risk	No details.

Twamley 2008 (*Continued*)

Blinding (performance bias and detection bias) All outcomes	High risk	Participants could identify the given intervention by contents of the program
Incomplete outcome data (attrition bias) All outcomes	Unclear risk	N=11 dropped-out of the study; n = 6 from IPS and n = 5 from CVR, with 'not wanting to work' most common reason
Selective reporting (reporting bias)	Low risk	All listed outcomes reported.
Other bias	Low risk	Funding: supported by a grant from the National Institute of Mental Health (MH066011)

Wong 2008

Methods	Allocation: randomised. Design: single centre. Duration: 18 months Country: Hong Kong, China.
Participants	Diagnosis: 70% schizophrenia-spectrum disorder, 18.5% affective disorder, 12.5% other (no description was given about how to make diagnosis) N=92. Setting: The Occupational Therapy Department, Kwai Chung Hospital Age: 18-55 years, mean 33.6 years. Sex: 55 M, 37 F Ethnicity: no description. History: days in psychiatric hospital in past 2 years for supported employment 161±190 and CVR 171±187; months working at a paid job in the past 5 years for supported employment 18.4±17.3 and CVR 13±15.6 Included: diagnosed at least 2 years ago with mental illness; aged 18 to 55 years; expressed interest in competitive employment; willing to participate in study Excluded: serious medical condition that may affect ability to perform competitive work Consent: written informed consent obtained.
Interventions	1. Individual placement and support, n = 46. 2. Conventional vocational rehabilitation programs, n = 46.
Outcomes	Days in any form of paid employment. Job stability (job tenure). Time to first competitive employment. Leaving the study early. Earnings (USD $). Obtained competitive employment.
Notes	High fidelity of IPS was assured using the IPS scale.

Wong 2008 (*Continued*)

Risk of bias		
Bias	**Authors' judgement**	**Support for judgement**
Random sequence generation (selection bias)	Low risk	Randomisation was done using computer-generated random numbers
Allocation concealment (selection bias)	Unclear risk	No details.
Blinding (performance bias and detection bias) All outcomes	High risk	Participants could identify the given intervention by contents of the program
Incomplete outcome data (attrition bias) All outcomes	Low risk	Number and reason for attrition reported. One participant from the control group was lost to follow-up after randomisation because of "loss of the contact point"
Selective reporting (reporting bias)	Low risk	All listed outcomes of interest reported.
Other bias	Unclear risk	Funding: supported by grant 216033 from the Health Care and Promotion Fund, Food and Health Bureau, Hong Kong

ACT-IPS: Assertive Community Treatment -Individual Placement and Support
ACT-IVR: Assertive Community Treatment-Integrated Vocational Rehabilitation
DSM: Diagnostic and Statistical Manual
ICD: International Classification of Diseases
IPS: Individual placement and support
ITT: intention-to-treat
RCT: randomised controlled trial
SCAN: Schedules for Clinical Assessment in Neuropsychiatry
SD: standard deviation

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

Study	Reason for exclusion
Alverson 1998	Allocation: randomised. Participants: patients with severe mental illness. Intervention: It was uncertain that supported employment was included Others: This study did not use quantitative but qualitative method

(*Continued*)

Bayer 2008	Allocation: randomised. Participants: patients with schizophrenia. Intervention: The vocational training ("Arbeitstherapie") in the intervention group consisted of manualised training of "basic work abilities" in the hospital (two centres) and outside of the hospital (three centres)
Bell 1993	Allocation: randomised. Participants: patients with schizophrenia or schizoaffective disorder Intervention: The intervention does not fulfil the definition of supported employment. All the posts were provided at the hospital in which the study was conducted
Bell 1993b	Allocation: randomised. Participants: patients with schizophrenia or schizoaffective disorder Intervention: The intervention does not fulfil the definition of supported employment. All the posts were provided at the hospital in which the study was conducted
Bell 1995	Allocation: randomised. Participants: patients with schizophrenia or schizoaffective disorder Intervention: The intervention does not fulfil the definition of supported employment. All the posts were provided at the hospital in which the study was conducted
Bell 1996	Allocation: randomised. Participants: patients with schizophrenia or schizoaffective disorder Intervention: The intervention does not fulfil the definition of supported employment. All the posts were provided at the hospital in which the study was conducted
Bell 1997	Allocation: randomised. Participants: patients with schizophrenia or schizoaffective disorder Intervention: The intervention does not fulfil the definition of supported employment. All the posts were provided at the hospital in which the study was conducted
Bell 2001	Allocation: randomised. Participants: patients with schizophrenia or schizoaffective disorder Intervention: This RCT compared neurocognitive enhancement therapy + work therapy to work therapy alone
Bell 2001b	Allocation: randomised. Participants: patients with schizophrenia or schizoaffective disorder Intervention: This RCT compared neurocognitive enhancement therapy + work therapy to work therapy alone
Bell 2002	Allocation: randomised. Participants: patients with schizophrenia or schizoaffective disorder Intervention: This RCT compared neurocognitive enhancement therapy + work therapy with work therapy alone
Bell 2003	Allocation: randomised. Participants: patients with schizophrenia or schizoaffective disorder Intervention: This RCT compared neurocognitive enhancement therapy + work therapy to work therapy

(*Continued*)

	alone
Bell 2003b	Allocation: randomised. Participants: patients with schizophrenia or schizoaffective disorder Intervention: This RCT compared neurocognitive enhancement therapy + work therapy to work therapy alone
Bell 2005	Allocation: randomised. Participants: patients with schizophrenia or schizoaffective disorder Intervention: This RCT compared neurocognitive enhancement therapy + work therapy with work therapy alone
Bell 2005b	Allocation: randomised. Participants: patients with schizophrenia or schizoaffective disorder Intervention: This RCT compared neurocognitive enhancement therapy + work therapy to work therapy alone
Bell 2007	Allocation: randomised. Participants: patients with schizophrenia or schizoaffective disorder Intervention: This RCT compared neurocognitive enhancement therapy + work therapy to work therapy alone
Bell 2007b	Allocation: randomised. Participants: patients with schizophrenia or schizoaffective disorder Intervention: This RCT compared neurocognitive enhancement therapy + work therapy with work therapy alone
Bell 2007c	Allocation: randomised. Participants: patients with schizophrenia or schizoaffective disorder Intervention: This RCT compared neurocognitive enhancement therapy + work therapy with work therapy alone
Bell 2007d	Allocation: randomised. Participants: patients with schizophrenia or schizoaffective disorder Intervention: This RCT compared neurocognitive enhancement therapy + work therapy with work therapy alone
Bell 2008	Allocation: randomised. Participants: patients with schizophrenia or schizoaffective disorder Intervention: This RCT compared neurocognitive enhancement therapy + work therapy to work therapy alone
Bell 2008b	Allocation: randomised. Participants: patients with schizophrenia or schizoaffective disorder Intervention: This RCT compared neurocognitive enhancement therapy + work therapy with work therapy alone
Bell 2009	Allocation: randomised. Participants: patients with psychotic disorder.

(*Continued*)

	Intervention: This RCT compared neurocognitive enhancement therapy + work therapy with work therapy alone
Blankertz 1997	Allocation: randomised. Participants: patients with severe mental illness. Intervention: The intervention "Long term support" does not fulfil the definition of supported employment
Bond 1986	Allocation: randomised. Participants: patients with severe mental illness. Intervention: study subjects in the accelerated condition were placed in set-aside jobs arranged by the agency. the jobs were temporary. Therefore, the experimental intervention does not fulfil the definition of supported employment
Bond 1995	Allocation: randomised. Participants: severe mental illness (66% schizophrenia or schizoaffective disorder) Intervention: supported employment compared to a gradual approach which consisted of a minimum of 4 months in pre-vocational preparation, followed by supported employment services Outcomes: no outcomes by 4 months (i.e. before both groups received supported employment)
Briggs 1966	Allocation: randomised. Participants: patients with psychoneurosis or functional psychosis, or psychiatric or emotional problems demonstrably severe enough to constitute a handicap to employment Intervention: This RCT compared an active treatment versus no treatment. The active treatment does not fulfil the definition of supported employment
Bryson 2002	Allocation: randomised. Participants: patients with schizophrenia or schizoaffective disorder Intervention: The intervention does not fulfil the definition of supported employment. All the posts were provided at the hospital in which the study was conducted
Bryson 2005	Allocation: randomised. Participants: patients with schizophrenia or schizoaffective disorder Intervention: This RCT compared neurocognitive enhancement therapy + work therapy with work therapy alone
Buchain 2003 (SE155)	Allocation: randomised. Participants: patients with treatment-resistant schizophrenia Intervention: The intervention does not fulfil the definition of supported employment
Chandler 1996 (SE156)	Allocation: randomised. Participants: patients with severe mental illness. Intervention: The integrated service agencies do not fulfil the definition of supported employment
Chandler 1996 (SE159)	Allocation: randomised. Participants: patients with severe mental illness. Intervention: The integrated service agencies do not fulfil the definition of supported employment

(*Continued*)

Chandler 1997 (SE157)	Allocation: randomised. Participants: patients with severe mental illness. Intervention: The integrated service agencies do not fulfil the definition of supported employment
Chandler 1997 (SE160)	Allocation: randomised. Participants: patients with severe mental illness. Intervention: The integrated service agencies do not fulfil the definition of supported employment
Chandler 1998 (SE158)	Allocation: randomised. Participants: patients with severe mental illness. Intervention: The integrated service agencies do not fulfil the definition of supported employment
Collier 2006	Allocation: randomised. Participants: patients with recent onset schizophrenia. Intervention: participants in this open label study will be randomly assigned to receive one of the following four combinations of an antipsychotic medication and a psychosocial treatment: cognitive enhancement training plus oral risperidone; cognitive enhancement training plus long-acting injectable risperidone; health behaviour training plus oral risperidone; or health behaviour training plus long-acting injectable risperidone. No comparison between with and without supported employment
Cook 2005	Allocation: randomised. Participants: people with severe mental illness. Intervention: a variety of interventions including supported employment Other: this study is an aggregation of 8 independent RCTs conducted in 8 different sites
Davis 2010	Allocation: randomised. Participants: Proportion of severe mental illness defined in the protocol less than 50%
Drebing 2007 (SE164)	Allocation: randomised. Participants: dually diagnosed veterans. Intervention: This RCT compared contingency management + vocational rehabilitation (VR) versus VR only. Both arms include supported employment
Gervey unpublished	Allocation: randomised. Participants: schizophrenic-spectrum disorders (34%), childhood disorders (33%), mood disorders (18%) , anxiety or personality disorders (15%)
Glynn 2005	Allocation: randomised. Participants: patients with schizophrenia. Intervention: This RCT compared supported employment + motivational interviewing to supported employment + psychoeducation. Both groups received supported employment
Greig 2007	Allocation: randomised. Participants: patients with schizophrenia. Intervention: This RCT compared supported employment with supported employment + neurocognitive enhancement therapy. Both groups received supported employment

(*Continued*)

Hu 1998 (SE166)	Allocation: randomised. Participants: patients with severe mental illness. Intervention: This RCT compared three case management programs. No comparison between with and without supported employment
Jones 2005 (SE143)	Allocation: randomised. Participants: young people with early psychosis and severe mood disorder Intervention: This RCT compared social recovery oriented cognitive behaviour therapy (SRCBT) to TAU. The SRCBT does not fulfil the definition of supported employment
Katz 2009 (SE144)	Allocation: randomised. Participants: schizophrenic patients. Intervention: This RCT compared occupational goal intervention (OGI) to frontal executive program (FEP). Both OGI and FEP does not fulfil the definition of supported employment
Lysaker 2004 (SE170)	Allocation: randomised. Participants: patients with schizophrenia or schizoaffective disorder Intervention: The Indianapolis vocational intervention program (IVIP) does not include or fulfil the definition of supported employment
Lysaker 2005 (SE169)	Allocation: randomised. Participants: patients with schizophrenia or schizoaffective disorder Intervention: The Indianapolis vocational intervention program (IVIP) does not include or fulfil the definition of supported employment
Lysaker 2006 (SE168)	Allocation: randomised. Participants: patients with schizophrenia or schizoaffective disorder Intervention: The Indianapolis vocational intervention program (IVIP) does not include or fulfil the definition of supported employment
Lysaker 2009 (SE167)	Allocation: randomised. Participants: patients with schizophrenia or schizoaffective disorder Intervention: The Indianapolis vocational intervention program (IVIP) does not include or fulfil the definition of supported employment
Malm 2003 (SE172)	Allocation: randomised. Participants: patients with schizophrenia or schizoaffective disorder Intervention: The intervention does not fulfil the definition of supported employment
Mangrum 2006 (SE173)	Allocation: randomised. Participants: patients with schizophrenic, schizophreniform, schizoaffective, or delusional disorders Intervention: This RCT compared an integrated with parallel treatment condition. The compared interventions do not include supported employment
Marder 2005 (SE145)	Allocation: randomised. Participants: patients with schizophrenia. Intervention: This RCT compared IPS + behavioural skills training versus IPS alone. No comparison between with and without supported employment

(*Continued*)

McFarlane 2002 (SE175)	Allocation: randomised. Participants: patients with severe mental illness. Intervention: This RCT compared Mental Health Employers Consortium (MHEC) + FACT versus FACT. Both groups received supported employment
McGurk 2005 (SE18)	Allocation: randomised. Participants: patients with schizophrenic, schizophreniform, schizoaffective, or delusional disorders Intervention: This RCT compared cognitive training + supported employment with supported employment only. Both groups received supported employment
McGurk 2007 (SE19)	Allocation: randomised. Participants: patients with schizophrenic, schizophreniform, schizoaffective, or delusional disorders Intervention: This RCT compared cognitive training + supported employment with supported employment only. Both groups received supported employment
McGurk 2009 (SE176)	Allocation: randomised. Participants: patients with schizophrenic, schizophreniform, schizoaffective, or delusional disorders Intervention: This RCT compared cognitive remediation + vocational rehabilitation (VR) with VR alone
Mueser 2005 (SE178)	This RCT compared supported employment + skills training with supported employment + TAU. Both groups received supported employment
Mueser 2008 (SE180)	Allocation: randomised. Participants: patients with severe mental illness. Intervention: This RCT compared supported employment + cognitive training with supported employment only. Both groups received supported employment
Mueser u1 (SE179)	Allocation: randomised. Participants: patients with severe mental illness. Intervention: This RCT compared supported employment + cognitive training with supported employment only. Both groups received supported employment
Okpaku 1997 (SE181)	Allocation: randomised. Participants: patients with mood disorders, schizophrenia etc Intervention: This RCT compared intensive case management versus no treatment. The vocational intervention included in the intensive case management does not fulfil the definition of supported employment
Toprac 2002	Allocation: randomised. Participants: patients with severe mental illness. Intervention: This RCT compared Employment Assistance through Reciprocity in Natural Supports (EARNS) ("rapid entry" supported employment (SE) combined with social network enhancement) versus standard supported employment services based on a "place-train" approach. Both groups received supported employment

IPS: individual placement and support
FACT: family-aided assertive community treatment

RCT: randomised controlled trial
TAU: treatment as usual

Characteristics of studies awaiting assessment *[ordered by study ID]*

McFarlane 2000

Methods	Allocation: randomised. Design: multi-centre Duration: 18 months Country: New York state, USA.
Participants	Diagnosis:schizophrenia-spectrum and mood disorder spectrum according to DSM-III-R N=69 Setting: community mental health centres Age: 18-55 years, mean 33.0 years. Sex: 48M, 21 F Ethnicity: 87% white, 3% Hispanic-American, 6% other.
Interventions	1. Family-aided assertive community treatment including supported employment 2. Conventional vocational rehabilitation
Outcomes	No extractable data available from available reports: further information needed
Notes	The word "individual placement and support" was not used for description of supported employment. No description given about fidelity of supported employment

Michon 2010

Methods	Allocation: randomised. Design: multi-centre Duration: 18 months Country: Netherlands
Participants	Clients of mental health teams specifically focused at people with severe mental illness (67% psychoses) (no description was given about how to make diagnosis) N=151 Setting: community mental health centres Age: 18-65 years, mean 35 years. Sex: 112M, 39 F Ethnicity: No data available.
Interventions	1. Individual placement and support integrated within case management teams. These teams (staff patient ratio of 1:20 to 30) deliver comprehensive treatment and care for severely mentally ill clients in their respective catchment areas 2. Traditional vocational services.
Outcomes	No extractable data available from available reports: further information needed

Michon 2010 (*Continued*)

Notes	High fidelity of IPS was assured using the IPS scale.

IPS: individual placement and support

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

Bejerholm 2009 (SE142)

Trial name or title	Supported Employment for People With Severe Mental Illness in a Swedish Context- A Randomised Controlled Trial
Methods	Supportive Care, Randomised, Double Blind (Investigator, Outcomes Assessor), Active Control, Parallel Assignment, Efficacy Study
Participants	Inclusion Criteria: • People with Severe mental illness, which mostly means having a diagnosis of psychosis • Communicate in Swedish • Express interest in working in the near future • Have professional care or support from psychiatric clinic • Attend to a SE-introductory meeting Exclusion Criteria: • Additional organic or physical disability to having psychosis Gender Both Ages 20 to 65 Years
Interventions	Individual Placement and Support-vocational rehabilitation, Vocational rehabilitation available
Outcomes	To determine the effectiveness of a SE in terms of health-related and functional outcomes, such as symptoms, perceived discrimination, empowerment, work-readiness, self-image, level of social and community participation, and quality of life
Starting date	April 2008
Contact information	Ulrika Bejerholm, the Vardal Institute, Medical Faculty, Lund University
Notes	

McFarlane 2008 (SE147)

Trial name or title	Early Detection and Intervention for the Prevention of Psychosis, A Multisite Study (EDIPP)
Methods	Multi-centre RCT.

Participants	Eligibility Ages Eligible for Study: 12 to 25 years Genders Eligible for Study: Both Accepts Healthy Volunteers: No Criteria Inclusion Criteria: Participants in the age range of 12-25 years and living in the experimental catchment area may be enrolled in the EDIPP study based on meeting at least one of the inclusion requirements AND none of the exclusion criteria Inclusion Criteria • Screening process indicates symptoms equivalent to a minimum rating of '1' on at least one positive symptom of psychosis. OR • Screening process indicates a likely family history of first degree relative with psychotic illness PLUS a deterioration in functioning equivalent to a 30% drop in functioning score over the past year. OR • Screening process indicates a likely history of Schizotypal Personality Disorder PLUS a deterioration in functioning equivalent to a 30% drop in functioning over the past year. Exclusion Criteria: Participants are excluded if: • Outside the age range of 12 to 25 years. • History of IQ below 70 (based on school records, not tested at PIER). • More than one month duration of psychosis (guided by the criteria of at least one 6 on the psychosis scales of the SIPS/SOPS). • History of previous psychotic episode, whether or not treatment was received. • Taken antipsychotic medication for more than 30 days at a therapeutic dose for psychotic symptoms. • Either the young person being screened for the study or both parents do not speak proficient English. • Female is pregnant at baseline (inquired on the screening interview). • Participant is a prisoner.
Interventions	1: No Intervention This is the control arm. Participants will be offered only case management 2: Experimental This is the experimental intervention arm for high risk- for-psychosis participants Drug: aripiprazole; fluoxetine; bupropion; sertraline; lamotrigine Oral, daily, generally at lower than manufacturer's recommendations Behavioural: Psychoeducational multifamily group treatment Families and patients are educated on psychobiology of psychosis and trained in coping skills to avoid psychosis by reducing stress and optimising social environment at home, school, work Behavioural: Supported employment and education Participants are provided direct assistance, guidance and ongoing support to gain employment and succeed in their educational goals
Outcomes	Primary Outcome Measures: • Conversion to psychosis [Time Frame: two years] Secondary Outcome Measures: • Social and occupational functioning [Time Frame: two years]

McFarlane 2008 (SE147) (*Continued*)

Starting date	October 2007
Contact information	William R. McFarlane, M.D. 207-662-2091 mcfarw@mmc.org William L. Cook, Ph.D 207-662-2091 cookw@mmc.org
Notes	

Nuechterlein 2008

Trial name or title	Individual Placement and Support for Individuals with Recent-Onset Schizophrenia: Integrating Supported Education and Supported Employment
Methods	RCT
Participants	Entry criteria: 1) a recent onset of psychotic illness, with the beginning of the first major psychotic episode occurring within the last 2 years; 2) a diagnosis by Research Diagnostic Criteria (RDC) (Spitzer, Endicott, & Robins, 1978) of schizophrenia or schizoaffective disorder, mainly schizophrenic subtype; 3) between 18 and 45 years of age; 4) no evidence of a known neurological disorder; 5) no evidence of significant and habitual drug abuse or alcoholism in the 6 months prior to hospitalisation, no evidence that the psychosis is accounted for by substance abuse, and no evidence that substance abuse will be a prominent factor in course of illness; 6) no premorbid mental retardation; 7) sufficient acculturation and fluency in the English language to avoid invalidating research measures of thought, language, and speech disorder, verbal abilities, and attitudes toward psychiatric illness; 8) residence within commuting distance of the UCLA Aftercare Program; 9) interest in trying to resume work or school.
Interventions	This study compared the combination of IPS and skills training with the Workplace Fundamentals Module with the combination of brokered vocational rehabilitation and broad-based social skills training
Outcomes	Primary Outcomes: • Return to regular work or school during 18 month trial (SAS Work Section) • Maintenance of work/school attendance over 18 months (SAS) • Quality of work functioning on Work Behaviour Inventory Secondary Outcomes: • Cognitive performance on test battery; • Exacerbation or relapse of psychotic symptoms (BPRS) • Retention in treatment • Awareness of illness (SUMD-R)
Starting date	May 1999
Contact information	Keith H. Nuechterlein, PhD UCLA Department of Psychiatry and Biobehavioral Sciences, Semel Institute for Neuroscience & Human Behavior

	300 UCLA Medical Plaza, Room 2240, Los Angeles, CA 90095-6968 E-mail: keithn@ucla.edu
Notes	

BPRS: Brief Psychiatric Rating Scale
IPS: individual placement and support
RCT: randomised controlled trial
SE: supported employment
SIPS: Structured Interview for Prodromal Symptoms
SOPS: Scale of Prodromal Symptoms
SUMD-R: Scale to assess Unawareness of Mental Disorder

DATA AND ANALYSES

Comparison 1. Supported employment versus other vocational approaches

Outcome or subgroup title	No. of studies	No. of participants	Statistical method	Effect size
1 Employment	3		Mean Difference (IV, Random, 95% CI)	Subtotals only
1.1 days in competitive employment (primary outcome) - long term	1	204	Mean Difference (IV, Random, 95% CI)	70.63 [43.22, 98.04]
1.2 days in any form of paid employment - long term	2	510	Mean Difference (IV, Random, 95% CI)	84.94 [51.99, 117.89]
1.3 job tenure for competitive employment (weeks) - long term	1	204	Mean Difference (IV, Random, 95% CI)	9.86 [5.36, 14.36]
1.4 job tenure for any paid employment (weeks) - long term	2	423	Mean Difference (IV, Random, 95% CI)	3.86 [-5.66, 13.38]
2 Employment (skewed)			Other data	No numeric data
2.1 days in competitive employment (primary outcome) - medium term			Other data	No numeric data
2.2 days in competitive employment (primary outcome) - long term			Other data	No numeric data
2.3 days in any form of paid employment - medium term			Other data	No numeric data
2.4 days in any form of paid employment - long term			Other data	No numeric data
2.5 job tenure for competitive employment (weeks) - medium term			Other data	No numeric data
2.6 job tenure for competitive employment (weeks) - long term			Other data	No numeric data
2.7 job tenure for any paid employment (weeks) - medium term			Other data	No numeric data
2.8 job tenure for any paid employment (weeks) - long term			Other data	No numeric data
2.9 Earnings from paid employment - CAN ($) - long term			Other data	No numeric data
2.10 Earnings from paid employment - USD ($) per hour - long term			Other data	No numeric data

2.11 Earnings from paid employment - USD ($) - long term			Other data	No numeric data
2.12 Earnings from paid employment - AUS ($) - medium term			Other data	No numeric data
3 Employment	7		Risk Ratio (M-H, Random, 95% CI)	Subtotals only
3.1 obtained any job during the study (high=better)	7	951	Risk Ratio (M-H, Random, 95% CI)	3.24 [2.17, 4.82]
4 Time (days) to first competitive employment	1		Mean Difference (IV, Fixed, 95% CI)	Subtotals only
4.1 long term	1	204	Mean Difference (IV, Fixed, 95% CI)	-161.60 [-225.73, -97.47]
5 Time (days) to first competitive employment (skewed)			Other data	No numeric data
5.1 medium term			Other data	No numeric data
5.2 long term			Other data	No numeric data
6 Leaving the study early for any reason	13	2114	Risk Ratio (M-H, Random, 95% CI)	0.76 [0.57, 1.01]
6.1 short term	1	92	Risk Ratio (M-H, Random, 95% CI)	0.33 [0.01, 7.98]
6.2 medium term	2	191	Risk Ratio (M-H, Random, 95% CI)	1.92 [0.98, 3.76]
6.3 long term	10	1831	Risk Ratio (M-H, Random, 95% CI)	0.66 [0.52, 0.84]
7 Mental state: Average endpoint specific symptom score (high = worse) - long term	3		Mean Difference (IV, Fixed, 95% CI)	Subtotals only
7.1 BPRS specific symptom score	1	152	Mean Difference (IV, Fixed, 95% CI)	-1.90 [-5.71, 1.91]
7.2 PANSS positive symptoms	2	446	Mean Difference (IV, Fixed, 95% CI)	-0.01 [-0.97, 0.96]
7.3 PANSS negative symptoms	2	446	Mean Difference (IV, Fixed, 95% CI)	-2.12 [-3.20, -1.05]
7.4 PANSS cognitive	1	194	Mean Difference (IV, Fixed, 95% CI)	-1.20 [-3.09, 0.69]
7.5 PANSS specific symptom score	1	194	Mean Difference (IV, Fixed, 95% CI)	-3.05 [-8.01, 1.91]
7.6 PANSS emotional discomfort symptoms	1	194	Mean Difference (IV, Fixed, 95% CI)	0.17 [-1.17, 1.51]
7.7 PANSS hostility/ excitement	1	194	Mean Difference (IV, Fixed, 95% CI)	-0.17 [-0.80, 0.46]
7.8 HADS anxiety	1	252	Mean Difference (IV, Fixed, 95% CI)	-0.20 [-1.30, 0.90]
7.9 HADS depression	1	252	Mean Difference (IV, Fixed, 95% CI)	-0.10 [-1.20, 1.00]
8 Service use: 1. Mean days in hospital (skewed)			Other data	No numeric data
8.1 long term			Other data	No numeric data
9 Service use: 2. Number of participants admitted to hospital	2		Risk Ratio (M-H, Fixed, 95% CI)	Subtotals only
9.1 long term	2	455	Risk Ratio (M-H, Fixed, 95% CI)	0.71 [0.53, 0.96]
10 Quality of Life: Average endpoint QOL-QOLI - various subscales (high = better)	5		Mean Difference (IV, Fixed, 95% CI)	Subtotals only
10.1 LQoLP-EU life in general	5	867	Mean Difference (IV, Fixed, 95% CI)	0.04 [-0.10, 0.18]

10.2 financial	1	194	Mean Difference (IV, Fixed, 95% CI)	0.10 [-0.32, 0.52]
10.3 job satisfaction	1	152	Mean Difference (IV, Fixed, 95% CI)	0.0 [-0.53, 0.53]
10.4 housing	1	152	Mean Difference (IV, Fixed, 95% CI)	0.0 [-0.46, 0.46]
10.5 town	1	152	Mean Difference (IV, Fixed, 95% CI)	0.20 [-0.29, 0.69]
10.6 leisure	2	346	Mean Difference (IV, Fixed, 95% CI)	0.01 [-0.25, 0.28]
10.7 services	1	152	Mean Difference (IV, Fixed, 95% CI)	0.0 [-0.38, 0.38]
10.8 vocational services	1	152	Mean Difference (IV, Fixed, 95% CI)	0.0 [-0.51, 0.51]
10.9 time spent with others	1	194	Mean Difference (IV, Fixed, 95% CI)	-0.15 [-0.48, 0.18]
10.10 socialisation	1	194	Mean Difference (IV, Fixed, 95% CI)	0.16 [-0.09, 0.41]
11 Global/Social functioning: Average endpoint general functioning score - GAS (high = better)	3		Mean Difference (IV, Fixed, 95% CI)	Subtotals only
11.1 long term	3	623	Mean Difference (IV, Fixed, 95% CI)	-0.70 [-2.82, 1.41]
12 Adverse effects: Death - natural and suicide	1		Risk Ratio (M-H, Fixed, 95% CI)	Subtotals only
12.1 long term	1	312	Risk Ratio (M-H, Fixed, 95% CI)	1.5 [0.25, 8.85]
13 Economic costs: 1. Direct costs (British £, skewed)			Other data	No numeric data
13.1 long term			Other data	No numeric data

Comparison 2. Sub-group analyses: High fidelity IPS vs other vocational approaches

Outcome or subgroup title	No. of studies	No. of participants	Statistical method	Effect size
1 Employment	2		Mean Difference (IV, Random, 95% CI)	Subtotals only
1.1 days in any form of paid employment - long term	1	306	Mean Difference (IV, Random, 95% CI)	99.80 [69.50, 130. 10]
1.2 job tenure for any paid employment - long term	1	225	Mean Difference (IV, Random, 95% CI)	-1.16 [-8.50, 6.18]
2 Leaving the study early for any reason	13	2114	Risk Ratio (M-H, Random, 95% CI)	0.76 [0.57, 1.01]
2.1 short term	1	92	Risk Ratio (M-H, Random, 95% CI)	0.33 [0.01, 7.98]
2.2 medium term	2	191	Risk Ratio (M-H, Random, 95% CI)	1.92 [0.98, 3.76]
2.3 long term	10	1831	Risk Ratio (M-H, Random, 95% CI)	0.66 [0.52, 0.84]
3 Mental state: Average endpoint specific symptom score (high = worse) - long term	3		Mean Difference (IV, Fixed, 95% CI)	Subtotals only
3.1 BPRS specific symptom score	1	152	Mean Difference (IV, Fixed, 95% CI)	-1.90 [-5.71, 1.91]
3.2 PANSS positive symptoms	2	446	Mean Difference (IV, Fixed, 95% CI)	-0.01 [-0.97, 0.96]
3.3 PANSS negative symptoms	2	446	Mean Difference (IV, Fixed, 95% CI)	-2.12 [-3.20, -1.05]
3.4 PANSS cognitive	1	194	Mean Difference (IV, Fixed, 95% CI)	-1.20 [-3.09, 0.69]
3.5 PANSS hostility/ excitement	1	194	Mean Difference (IV, Fixed, 95% CI)	-0.17 [-0.80, 0.46]
3.6 PANSS emotional discomfort symptoms	1	194	Mean Difference (IV, Fixed, 95% CI)	0.17 [-1.17, 1.51]

3.7 PANSS specific symptom score	1	194	Mean Difference (IV, Fixed, 95% CI)	-3.05 [-8.01, 1.91]
3.8 HADS anxiety	1	252	Mean Difference (IV, Fixed, 95% CI)	-0.20 [-1.30, 0.90]
3.9 HADS depression	1	252	Mean Difference (IV, Fixed, 95% CI)	-0.10 [-1.20, 1.00]
4 Service use: Number of participants admitted to hospital	2		Risk Ratio (M-H, Fixed, 95% CI)	Subtotals only
4.1 long term	2	455	Risk Ratio (M-H, Fixed, 95% CI)	0.71 [0.53, 0.96]
5 Quality of Life: Average endpoint QOL-QOLI - various subscales (high = better)	4		Mean Difference (IV, Random, 95% CI)	Subtotals only
5.1 LQoLP-EU life in general	4	648	Mean Difference (IV, Random, 95% CI)	-0.02 [-0.19, 0.14]
5.2 job satisfaction	1	152	Mean Difference (IV, Random, 95% CI)	0.0 [-0.53, 0.53]
5.3 housing	1	152	Mean Difference (IV, Random, 95% CI)	0.0 [-0.46, 0.46]
5.4 town	1	152	Mean Difference (IV, Random, 95% CI)	0.20 [-0.29, 0.69]
5.5 leisure	2	346	Mean Difference (IV, Random, 95% CI)	0.01 [-0.25, 0.28]
5.6 services	1	152	Mean Difference (IV, Random, 95% CI)	0.0 [-0.38, 0.38]
5.7 vocational services	1	152	Mean Difference (IV, Random, 95% CI)	0.0 [-0.51, 0.51]
5.8 time spent with others	1	194	Mean Difference (IV, Random, 95% CI)	-0.15 [-0.48, 0.18]
5.9 socialisation	1	194	Mean Difference (IV, Random, 95% CI)	0.16 [-0.09, 0.41]
6 Global/Social functioning: Average endpoint general functioning score - GAS (high = better)	2		Mean Difference (IV, Fixed, 95% CI)	Subtotals only
6.1 long term	2	404	Mean Difference (IV, Fixed, 95% CI)	-0.70 [-3.08, 1.67]
7 Adverse effects: Death - natural and suicide	1		Risk Ratio (M-H, Fixed, 95% CI)	Subtotals only
7.1 long term	1	312	Risk Ratio (M-H, Fixed, 95% CI)	1.5 [0.25, 8.85]

Comparison 3. Sensitivity analysis: Excluding trials with less than 80% follow-up on the variable at the time point

Outcome or subgroup title	No. of studies	No. of participants	Statistical method	Effect size
1 Employment	2		Mean Difference (IV, Random, 95% CI)	Subtotals only
1.1 days in competitive employment (primary outcome)	1	204	Mean Difference (IV, Random, 95% CI)	70.63 [43.22, 98.04]
1.2 days in any form of paid employment	2	510	Mean Difference (IV, Random, 95% CI)	84.94 [51.99, 117.89]
1.3 job tenure for competitive employment (weeks)	1	204	Mean Difference (IV, Random, 95% CI)	9.86 [5.36, 14.36]
1.4 job tenure for any paid employment (weeks)	1	204	Mean Difference (IV, Random, 95% CI)	8.56 [2.01, 15.11]
2 Time (days) to first competitive employment	1	204	Mean Difference (IV, Random, 95% CI)	-161.60 [-225.73, -97.47]
3 Leaving the study early for any reason	6	1054	Risk Ratio (M-H, Random, 95% CI)	0.92 [0.54, 1.58]

3.1 medium term	2	191	Risk Ratio (M-H, Random, 95% CI)	5.27 [1.36, 20.34]
3.2 long term	4	863	Risk Ratio (M-H, Random, 95% CI)	0.65 [0.40, 1.05]
4 Service use: 2. Number of participants admitted to hospital	1		Risk Ratio (M-H, Fixed, 95% CI)	Subtotals only
4.1 long term	1	312	Risk Ratio (M-H, Fixed, 95% CI)	0.63 [0.44, 0.90]
5 Quality of Life: Average endpoint QOL-QOLI - various subscales (high = better)	4		Mean Difference (IV, Random, 95% CI)	Subtotals only
5.1 LQoLP-EU life in general - long term	4	817	Mean Difference (IV, Random, 95% CI)	0.04 [-0.13, 0.20]

Comparison 4. Sensitivity analysis: Excluding trials where IPS was augmented with other interventions

Outcome or subgroup title	No. of studies	No. of participants	Statistical method	Effect size
1 Employment	2		Mean Difference (IV, Random, 95% CI)	Subtotals only
1.1 job tenure for any paid employment (weeks) - long term	2	423	Mean Difference (IV, Random, 95% CI)	3.86 [-5.66, 13.38]
2 Leaving the study early for any reason	9	1364	Risk Ratio (M-H, Random, 95% CI)	0.89 [0.60, 1.33]
2.1 medium term	3	241	Risk Ratio (M-H, Random, 95% CI)	2.76 [0.62, 12.38]
2.2 long term	6	1123	Risk Ratio (M-H, Random, 95% CI)	0.71 [0.49, 1.01]

WHAT'S NEW

Last assessed as up-to-date: 23 May 2012.

Date	Event	Description
16 September 2013	Amended	Reference corrected.

HISTORY

Protocol first published: Issue 1, 2010

Review first published: Issue 9, 2013

Date	Event	Description
6 October 2010	Amended	Contact details updated.
15 February 2010	Amended	Contact details updated.

CONTRIBUTIONS OF AUTHORS

Yoshihiro Kinoshita - developed and wrote protocol, participated in literature searches, selected studies and extracted data, wrote report.

Toshi A Furukawa - protocol development, helped in studies selection, data extraction and writing the report.

Kuni Kinoshita - participated in studies selection and data extraction.

Mina Honyashiki - participated in studies selection and data extraction.

Ichiro M Omori - developed protocol, helped in studies selection.

Max Marshall - developed protocol.

Gary R Bond - developed protocol, helped in studies selection and data extraction.

Peter Huxley - developed protocol.

Naoji Amano - helped in writing the report.

David Kingdon - developed protocol.

DECLARATIONS OF INTEREST

None known.

SOURCES OF SUPPORT

Internal sources

- Department of Psychiatry and Cognitive-Behavioral Medicine, Nagoya CityUniversity Graduate School of Medical Sciences, Japan.
- Department of Psychiatry, University of Southampton, UK.
- Department of Psychiatry, Shinshu University School of Medicine, Japan.

External sources

- none, Not specified.

DIFFERENCES BETWEEN PROTOCOL AND REVIEW

1. Types of participants

A sentence "Trials were included where a majority of participants (more than 50%) were suffering from schizophrenia and schizophrenia-like disorders; bipolar disorders; or depression with psychotic features." was included.

2. Types of interventions

A description "Fidelity of IPS was assessed by a two-step procedure explained below:
1. Two review authors (YK and KK) independently selected RCTs that assured fidelity of IPS using the IPS scale (Bond 1997b). Trials which did not fulfil this criterion were rated those with low fidelity IPS.
2. The same two review authors checked the selected articles. If detailed description, especially in terms of engagement and intensity, indicated low fidelity of IPS conducted in some of the RCTs, fidelity of such IPS was rated as low in this review. If not, fidelity of the IPS was classified as high. The reason for judgement for the low fidelity IPS is presented in Characteristics of included studies." was included.

3. Types of outcome measures

A description "a follow-up duration of 12 months was also considered as long term" was added.

4. Secondary outcomes

We renamed the outcome 1.4 "Job stability" to Job tenure and defined it.
Item 1.5 "Numbers not participating in programmes (as defined by individual studies)" was omitted.
Item 3. Leaving the study early: A description "(i.e. Number of participants who dropped-out from service)" was added.
Items 4.5 Average endpoint global state score and 4.6 Average change in global state scores were omitted because these items overlapped with items 8.1 Average endpoint general functioning score and 8.2 Average change in general functioning scores.
With regard to "8.1 Average endpoint general functioning score", we made post-hoc decision to add the following description: "When Global Assessment of Functioning (GAF) was rated in symptoms and disability separately, lower score thereof was considered as general GAF score, and extracted and integrated in a meta-analysis.

5. Data and analyses section

This was modified because exclusion and inclusion of skewed data seemed incomplete. For example, Mueser 2004 (n >= 200) was not included in some items of sub-group analyses "high fidelity IPS vs. other vocational approaches".

6. Sensitivity analysis

In a original sentence "We will examine the robustness of our findings by excluding (i) studies with less than 20% follow up on the variable at the time point...", an exclusion criterion for follow-up rate was changed from "less than 20%" to "less than 80%".

7. Subgroup analysis and investigation of heterogeneity

6.1 Pre-planned subgroup analyses

A description "(a) Excluding studies with low fidelity IPS and augmented supported employment" was substituted with "(a) High fidelity IPS versus other vocational approaches" to clarify what was done in the procedure.
A description "(b) Augmented supported employment versus treatment as usual" was substituted with "(b) Augmented supported employment versus other vocational approaches" to clarify what was done in the procedure.

8. Overall

Some sections of the methods text have been updated to reflect updates in the Cochrane Schizophrenia Group methods.

INDEX TERMS

Medical Subject Headings (MeSH)

Employment, Supported [*psychology; statistics & numerical data]; Mental Disorders [*rehabilitation]; Randomized Controlled Trials as Topic

MeSH check words

Adult; Humans