

Effectiveness of augmented Individual Placement and Support interventions for competitive employment in people with schizophrenia: Systematic review and meta-analysis

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ABSTRACT

Background. It has been estimated that over 70% of people living with a diagnosis of schizophrenia wish to work. The Individual Placement and Support (IPS) model has proven to be highly effective in enhancing competitive employment in people with schizophrenia. However, the efficacy of augmented IPS interventions, in other words, those that incorporate a psychosocial intervention into the model, has not been evaluated in this population. **Objective.** To assess the efficacy of augmented IPS interventions designed to obtain competitive employment in people with schizophrenia. **Method.** A systematic review of the literature on randomized clinical trials of augmented IPS interventions, published in English between 2007 and 2017, was conducted in the electronic databases of PubMed, Science Direct, and EBSCO. Risk of bias and competitive employment rates were calculated. A meta-analysis was performed using the random effects method to estimate the effect of augmented IPS interventions. **Results.** Twelve articles were identified in which 10 augmented IPS interventions were compared with other interventions. In eight studies conducted on people with schizophrenia, the intervention was based on IPS + social skills/work skills/cognitive remediation vs. IPS or modified IPS. No general effect favoring augmented interventions ($RR = 1.37$, 95% CI [.97, 1.95], $I^2 = 52%$) was found. Augmented IPS interventions tend to be more effective when they are implemented during the first psychotic episode. **Discussion and conclusion.** It is not possible to conclude that augmented IPS interventions have a significant effect over standard IPS interventions in obtaining competitive employment in people with schizophrenia.

Keywords: Supported employment, schizophrenia, meta-analysis, literature review.

RESUMEN

Antecedentes. Se ha estimado que más del 70% de las personas que viven con diagnóstico de esquizofrenia desean trabajar. El modelo Individual Placement and Support (IPS) ha mostrado efectividad para que las personas con esquizofrenia consigan un empleo competitivo. Sin embargo, en esta población no se ha evaluado la eficacia de las intervenciones aumentadas de IPS —es decir, aquellas que añaden al modelo una intervención psicosocial—. **Objetivo.** Evaluar la eficacia de las intervenciones aumentadas de IPS dirigidas a la obtención de empleo competitivo en personas con esquizofrenia. **Método.** Se realizó una revisión sistemática de la literatura de ensayos clínicos aleatorizados sobre intervenciones aumentadas de IPS publicados en inglés entre 2007 y 2017, en las bases de datos electrónicas de PubMed, Science Direct y EBSCO. Se calcularon el riesgo de sesgo y las tasas de empleo competitivo. Se realizó un metaanálisis mediante el método de efectos aleatorios para estimar el efecto de las intervenciones aumentadas de IPS. **Resultados.** Se identificaron 12 artículos en los que se comparaban 10 intervenciones aumentadas de IPS con alguna otra intervención. En ocho estudios realizados en personas con esquizofrenia, la intervención se basó en IPS + habilidades sociales/habilidades laborales/remediación cognitiva vs. IPS o IPS modificadas, sin que se encontrara un efecto general en favor de las intervenciones aumentadas ($RR = 1.37$, 95% IC [.97, 1.95], $I^2 = 52%$). Las intervenciones aumentadas de IPS tienden a ser más efectivas cuando se llevan a cabo en el primer episodio psicótico. **Discusión y conclusión.** No se puede concluir que las intervenciones aumentadas de IPS tengan un mayor efecto sobre las intervenciones estándar de IPS para la obtención de empleo competitivo en personas con esquizofrenia.

Palabras clave: Empleos subvencionados, esquizofrenia, metaanálisis, literatura de revisión.

BACKGROUND

Schizophrenia is a mental disorder present in 1% of the population, representing an important source of costs for the health system and society. In 2013, the cost of schizophrenia was \$155.7 billion USD in the United States (USA), 38% of which was associated with unemployment, 35% of which was related to lost productivity due to care, and only 24% to direct costs related to health care (Cloutier et al., 2016). It is therefore important to redirect the provision of care services and treatment focused on the control of symptoms towards the promotion of outcomes linked to functional performance of those living with these disorders (Cloutier et al., 2016; Chong et al., 2016).

Employment is a goal of functionality and recovery in people with schizophrenia, linked to an improvement in the quality of life (Bouwman, de Sonnevill, Mulder, & Hakkaart-van Rooijen, 2015; Luciano, Bond, & Drake, 2014; van Rijn, Carlier, Schuring, & Burdorf, 2016), social functioning (Charzynska, Kucharska, & Mortimer, 2015), increased self-esteem, improvement of psychiatric symptoms, decrease in the number of hospitalizations, as well as the response to pharmacological treatment (Luciano et al., 2014). Despite the fact that 70% of health service users diagnosed with schizophrenia have expressed an interest to work, the evidence shows that this recovery goal is far from being reached and that, in addition to the low employment rate, they are at risk of living in a street situation, as well as suffering from stigma or victimization (Drake & Whitley, 2014).

Within work rehabilitation models, the Individual Placement and Support (IPS) model has stood out due to its effectiveness in obtaining competitive employment, defined as the condition of being hired in an activity or service in exchange of a salary or payment. The IPS model has solid evidence due to the methodological rigor of its application. It consists of eight postulates: 1. the objective is to obtain competitive employment; 2. it is available to anyone with a serious mental illness (SMI) with a desire to work; 3. the job search begins when joining the program; 4. potential jobs are chosen according to the preferences of the participant; 5. employment specialists develop relationships with employers, on the basis of patient preferences; 6. the support provided in the program is unlimited in time and continues after the employment is obtained; 7. the program is integrated into the mental health care services; and 8. personalized counseling is provided (Becker & Drake, 1993; Drake, Bond, & Becker, 2012).

The IPS model achieves success rates of over 50% of competitive employment in people with SMI in six-month periods (Drake et al., 1999; Drake & Becker, 1996). However, it has proven to be less optimal in job tenure, since 50% fail to maintain employment at follow-up beyond six months (Bond, Drake, Mueser, & Becker, 1997; Tsang, Chan, Wong, & Liberman, 2009). Accordingly, augmented

versions have been developed in which IPS is complemented by other psychosocial interventions (Gold et al., 2006; McGurk, Mueser, & Pascaris, 2005; Mueser et al., 2005; Wallace & Tauber, 2004). Systematic reviews and recent meta-analysis on supported employment in people with SMI (Carmona, Gomez-Benito, Huedo-Medina, & Rojo, 2017; Kinoshita et al., 2013; Modini et al., 2016; Suijkerbuijk et al., 2017) do not evaluate the effectiveness of augmented IPS interventions or stratify their results by diagnosis. This is important due to the functional limitations entailed by schizophrenia (Harvey et al., 2012), as well as the accompanying stigma compared with other SMI, which leads to lower employment rates.

Given that the planning of rehabilitation and reinsertion in mental health services requires more effective interventions, this research sought to evaluate the effectiveness of augmented IPS interventions, designed to obtain competitive employment in people with schizophrenia and other psychoses.

METHOD

We conducted a systematic review of the literature published in English between 2007 and 2017 in the electronic databases of Medline (PubMed), ScienceDirect, and EBS-CO, on IPS-based interventions that added other psychosocial interventions, with the aim of increasing the effect on obtaining or maintaining competitive employment in people with schizophrenia and other psychoses.

Randomized clinical trials (RCTs) of people diagnosed with psychosis, mainly schizophrenia (in more than 60% of the total sample), who were over 18 years of age, were included. The interventions evaluated were those based on IPS in combination with another psychosocial intervention, designed to obtain or maintain competitive employment (this combination was called “augmented IPS”). The main outcome was obtaining and maintaining competitive employment, while secondary outcomes included the number of hours and weeks worked, as well as the salary in dollars (or any local currency).

Search methods for the identification of studies

First, an electronic search that combined MeSH terms and descriptors was carried out. Afterwards, potentially important studies were identified through the references in the articles identified in the electronic search. We attempted to contact the authors of those articles in which more information was required.

Selection of studies and data extraction

The titles of the articles obtained in the search were reviewed and the abstracts were subsequently analyzed to

evaluate inclusion and exclusion criteria. This review was conducted by two independent researchers and, in the event of disagreement, a third party intervened. A kappa coefficient of 89% was obtained. Subsequently, full articles were reviewed and main characteristics and outcomes were extracted in duplicate.

Bias risk evaluation

The evaluation was done by three raters and the risk of selection, performance, detection, attrition, and notification bias was established on the basis of the *Cochrane Handbook for Systematic Reviews of Interventions*.

Statistical analysis

Using competitive employment rates as a dichotomous variable, *risk ratios* were calculated while means and standard deviations (*SD*) were reported for the continuous variables (hours, work weeks, and salary). A meta-analysis was carried out using the random effects method, which expands the confidence intervals for the average effect of the intervention and makes statistical significance more conservative (Higgins & Green, 2011). Heterogeneity was calculated using the Cochrane’s *Q* test and the *I*² statistic, where a value below 25% denotes low, 50% moderate, and 75% high heterogeneity (Higgins & Green, 2011). The publication bias was evaluated through visual inspection of the funnel plot. Lastly, stratified analyses were performed by diagnosis, comparing the meta-analysis between those with schizophrenia versus first psychotic episode, as well as among the clinical interventions that were more homogeneous according to the raters. The statistical analyses were carried out using Stata version 14 and Review Manager 5 (Revman 5).

RESULTS

Description of studies

Search results

A total of 476 articles were identified, 44 titles were selected, and full text of 23 articles were reviewed by three raters. Lastly, 12 articles comparing 10 augmented IPS interventions with another intervention (IPS, modified IPS, or usual treatment) were selected (Figure 1).

Studies included

Twelve studies that met the inclusion criteria were reviewed, although four of them were follow-up studies by Killackey, Jackson, and McGorry (2008), and Baksheev, Allott, Jackson, McGorry, and Killackey (2012) in Australia; Au et al. (2015), and Tsang, Bell, Cheung, Tam, and Yeung (2016) in

China. It is worth mentioning that the raters identified similarities in the results shown in the articles by Tsang et al. (2009), and Tsang, Fung, Leung, Li, and Cheung (2010), as a result of which an attempt was made to contact the author. However, in the absence of response, it was decided to consider them as individual studies due to the differences in the total sample, the characteristics of the participants, and the recruitment periods. Therefore, in the end, 10 augmented IPS interventions were described.

Designs

All the studies were randomized clinical trials (RCTs), four of which were multicentric: one by McGurk, Mueser, Feldman, Wolfe, and Pascaris (2007), conducted at two rehabilitation centers in Brooklyn; one by Tsang et al. (2009), carried out at three community mental health units and three-day hospitals; one by Craig et al. (2014), undertaken at four units in England; one by Au et al. (2015) and its follow-up by Tsang et al. (2016), conducted at two day clinics in China.

Place and time

Most of the studies were done in the USA (*n* = 5), followed in frequency by China (*n* = 3), Australia (*n* = 1), and En-

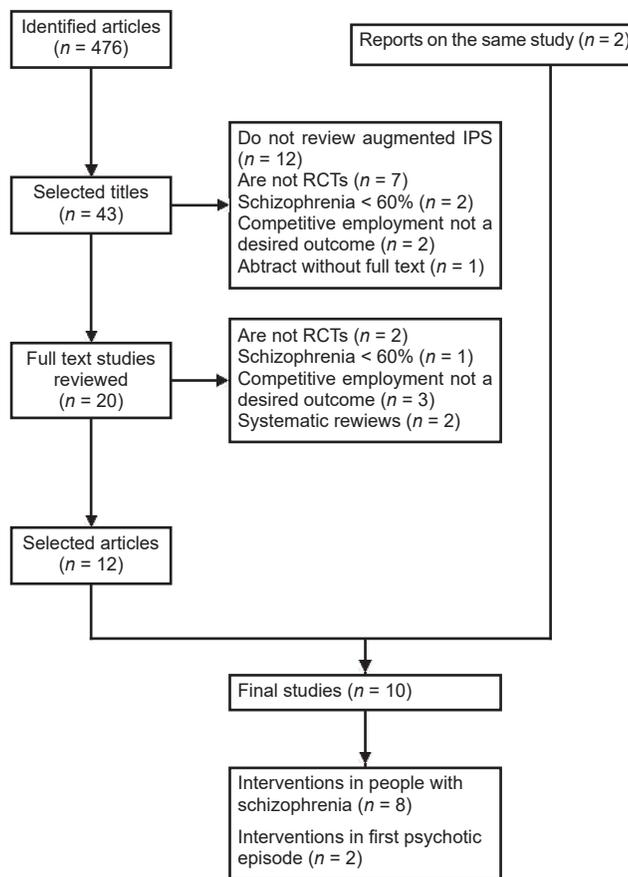


Figure 1. Review flowchart.

Table 1
Description of augmented IPS interventions

Author and year (country)	Participant characteristics	Diagnosis	Intervention	Control group	Follow-up period	IPS Fidelity Percentage
McGurk et al., 2007 (USA)	N = 44, IG = 23, CG = 21 Age = 37.6 (SD 9.9) Men = 54.5%	Schizophrenia = 72.7% Schizoaffective = 4.6% Mood Disorders = 22.7%	IPS + <i>Thinking skills for work program</i> (24 hours IPS of computer-based cognitive exercises in CogPack with 45 to 60-minute sessions, 2 or 3 sessions per week, in 12 weeks) IPS + usual treatment	IPS	26 months	60 - 66 / 75
Killackey et al., 2008; Baksheev et al., 2012 (Australia)	N = 41, IG = 20, CG = 21 Age: IG = 21.3 (SD 2.4) CG = 21.4 (SD 2.2) Men: IG = 80%, CG = 81	First psychotic episode: 100%	NET cognitive improvement therapy = 10 hours a week of cognitive exercises + hybrid supervised transitional employment program (VOC)	Usual treatment = vocational intervention through individual case management, medical care, referral to external vocational agencies, group program	6 months	68 / 75
Bell et al., 2008 (USA)	N = 72, IG = 38, CG = 34 Age: IG = 42.0 (SD 9.9) CG = 37.2 (SD 9.0) Men: IG = 61%, CG = 47%	Schizophrenia: IG = 74%, CG = 65 Schizoaffective disorder: IG = 80%, CG = 35%	NET cognitive improvement therapy = 10 hours a week of cognitive exercises + hybrid supervised transitional employment program (VOC)	VOC = modified version of IPS plus paid transitional employment to facilitate rapid placement in community sites	24 months	62 / 75
Tsang et al., 2009 (China)	N = 163, IG = 52, CG1 = 56, CG2 = 55 Age: IG = 33.5 (SD 9.1) CG1 = 33.8 (SD 9.1) CG2 = 36.4 (SD 7.6) Men: IG = 50%, CG1 = 51.8%, CG2 = 47.3%	Schizophrenia: IG = 78.8% CG1 = 75% CG2 = 78.2%	IPS + work related social skills training (10 sessions of teaching job interview skills, basic conversation and social survival skills for effective communication with supervisors, co-workers and clients, 10 1.5 -2-hour sessions)	CG1 = IPS, CG2 = traditional vocational service consisting of vocational evaluation and training	15 months	65 - 68 / 75
McGurk et al., 2009 (USA)	N = 34, IG = 18, CG = 16 Age: IG = 45.5 (SD 9.6), CG = 42.4 (SD 8.5) Men: IG = 61%, CG = 56%	Schizophrenia: IG = 75% CG = 60%	Hybrid vocational rehabilitation program (based on IPS and supported employment) + cognitive remediation (3-6 months CogPack)	Vocational rehabilitation based on IPS plus case management, pharmacological treatment, day activities, home support service, voluntary work, supported employment.	24 months	High, score not described
Tsang et al., 2010 (China)	N = 189, IG = 58, CG1 = 65 Age: IG = 34.1 (SD 8.7), CG1 = 34.1 (SD 9) Men: IG = 44.8%, CG = 55.4%	Schizophrenia: IG = 77.6% CG = 72.3%	IPS + work related social skillstraining	IPS	39 months	66 - 68 / 75
Craig et al., 2014 (England)	N = 159, IGL = 39, IGM = 42, CGL = 40, CGM = 38 Age: IGL = 25 (SD 4.2), IGM = 23 (SD 4.2) CGL = 24 (SD 4.7), CGM = 24 (SD 3.7) Men: IGL = 72%, IGM = 81% CGL = 63%, CGM = 76%	First psychotic episode: 100%	IPS + motivational intervention. Assignment by IPS conglomerates in two centers: London and Midlands	IPS	6 and 12 months	IGL = 111/125, IGM = 114/125 - 116/125
Bell et al., 2014 (USA)	N = 174, IG = 99, CG = 75 Groups according to QLS score: Low IG = 46, High IG = 53 Low CG = 44, High CG = 31 Age: Low IG = 41.3 (SD 10.3) High IG = 42.5 (SD 10.7) Low CG = 40 (SD 9) High CG = 40.4 (SD 10.5) Men: Low IG = 72%, High IG = 53% Low CG = 55%, High CG = 48% N = 107, IG = 51, CG = 56 Age = 37.6 (SD 9.9) Men = 82%	Schizophrenia: Low IG = 78% High IG = 67% Low CG = 70% High CG = 60% Schizoaffective: Low IG = 72% High IG = 53% Low CG = 55% High CG = 48% or schizoaffective = 100%	Supervised employment (IPS + group therapy: work and lifestyle) + Cognitive Remediation therapy: work and lifestyle (10 hours / week)	Supervised employment (IPS + group therapy: work and lifestyle) + Cognitive Remediation therapy: work and lifestyle (10 hours / week)	24 months	Not described
Glynn et al., 2017 (USA)	N = 90, IG = 45, CG = 45 Age: IG = 35.4 (SD 9.2) CG = 36.9 (SD 9.4) Men: IG = 62.2%, CG = 64.4%	Schizophrenia: IG = 64.4% CG = 51.1% Schizoaffective: IG = 80%, CG = 48.9%	IPS + WPFM (<i>Work place fundamentals module</i> , IPS job skills such as identification of benefits and costs of working, problem solving, handling of medication side effects, substance abuse, interaction with supervisor, job culture, job motivation)	IPS	24 months	65 / 75
Au et al., 2015; Tsang et al., 2016 (China)	N = 90, IG = 45, CG = 45 Age: IG = 35.4 (SD 9.2) CG = 36.9 (SD 9.4) Men: IG = 62.2%, CG = 64.4%	Schizophrenia: IG = 64.4% CG = 51.1% Schizoaffective: IG = 80%, CG = 48.9%	Integrated supervised employment (ISE) + cognitive remediation (<i>Strong Arm and Captain's Log</i>) (3 weekly sessions) software	combination of IPS plus job-related social skills training	7, 11 and 15 months	Not described

Note: IG = intervention group, CG = control group, SD = standard deviation, BPRS = Brief Psychiatric Rating Scale, QLS = Quality of Life Scale, Low IG or CG = Intervention group with low QLS score, High IG or CG High = intervention group with high QLS score, IGL or CGL = Groups in London, IGM or CGM = Groups in the Midlands, NS = no statistical significance.

gland ($n = 1$). The follow-up time ranged from six to 39 months, with follow-up rates varying from 89% at 11 months by Tsang et al. (2016), to 76% for the intervention group and 63% for the control group at 39 months in the article by Tsang et al. (2010). The 100% follow-up at 24 months in the article by Bell, Zito, Greig and Wexler (2008) is worthy of note.

Augmented IPS interventions

The set of interventions evaluated was diverse and included the following psychosocial interventions: cognitive remediation, social skills, motivational interventions, job skills, and IPS in addition to usual care. Cognitive remediation strategies were used in five studies, two led by McGurk (McGurk, Mueser, DeRosa, & Wolfe, 2009; McGurk et al., 2007), two by Bell (Bell, Choi, Dyer, & Wexler, 2014; Bell et al., 2008), and one by Au et al. (2015) and its follow-up by Tsang et al. (2016). For the last study, two types of cognitive remediation softwares were used: the *Strong Arm System* and the *Captain's Log*, in which participants could have received up to 72 hours of training. In turn, in those by McGurk et al. (2009; 2007), *Cogpack* software was used for two to three weeks and up to six months. Bell et al. (2008) used *CogRehab* and *Sci-Learn*, adding *PositScience's Brainfitness* and *Insight* software (Bell et al., 2014). Likewise, the two studies by Tsang et al. (2009; 2010) combined IPS and social skills. The three remaining interventions were: a motivational intervention (Craig et al., 2014), one with the addition of job skills (Glynn et al., 2017), and finally one that included IPS plus usual treatment, which included individual attention and referral to external vocational agencies (Killackey et al., 2008).

Control group interventions

Nine articles included IPS-based interventions, five of which were augmented IPS interventions (Au et al., 2015; Bell et al., 2014; Bell et al., 2008; McGurk et al., 2009; Tsang et al., 2009); four standard IPS interventions (Craig et al., 2014; Glynn et al., 2017; McGurk et al., 2007; Tsang et al., 2010), the remainder being based on usual treatment, which included individual care and referral to external vocational agencies (Killackey et al., 2008).

IPS fidelity scale score

Given the variability between interventions derived from the standard IPS model, Bond, Peterson, Becker, and Drake (2012) designed a scale that assesses the degree of adherence to the IPS model standards. This was done on the fact that the implementation of programs to which there is high adherence will achieve similar outcomes to those obtained in controlled studies that established the effectiveness of the model.

Most RCTs ($n = 8$) included in this review report the score obtained and describe it as adequate ($> 80\%$), with only two articles failing to report this (Au et al., 2015; Bell et al., 2014). A general description of the studies reviewed is given in Table 1.

Evaluation of bias in the studies included

Inter-rater consensus shows a low risk of selection bias, since most of the studies reported random generation of the sequence, carried out mainly through statistical software. There is no clear risk of allocation concealment bias, although neither this nor the blinding of participants and staff is likely to be achieved given the psychosocial nature of the interventions. On the other hand, there is a high risk of incomplete data at follow-up, identified in five studies (Craig et al., 2014; Glynn et al., 2017; McGurk et al., 2009; McGurk et al., 2007; Tsang et al., 2010). The majority showed a low risk of notification bias, and a low risk in relation to publication bias, on the basis of visual inspection of the funnel plot (Figure 2).

Population

The total sample was 1 073 participants, with 485 in the augmented IPS intervention groups and 588 in the comparison groups. The average age of those with a schizophrenia diagnosis ranged from 33.5 to 45.5 years. Meanwhile, in the first psychotic episode, the average age was between 21.3 and 25 years. Over half the sample was male, with the exception of the studies by Bell et al. (2014) and its follow-up by Tsang et al. (2010), where they accounted for between 44.8% and 48%, respectively.

Description of job outcomes

Percentages of competitive jobs

Job outcomes are described in Table 2. Four studies reported statistically significant differences in favor of the intervention groups (IG), with percentages ranging from 33% vs. 12% (Tsang et al., 2010) and up to 69.6% vs. 14.3% (McGurk et al., 2007). Bell et al. (2014) only indicated a higher percentage in the subgroup with low community functioning (IG = 49% vs. CG = 20%). Four studies (Au et al., 2015; Bell et al., 2008; Glynn et al., 2017; McGurk et al., 2009) reported higher percentages of competitive employment in control groups (CG).

Hours of work per week

Only two studies reported statistically significant differences in favor of the intervention groups: the one by Killackey et al. (2008) in Australia (IG = 33.9 [SD 15.5], CG = 22.5 [SD 10.6], $p = .006$) and Bell et al. (2008) in the USA. (IG = 59.2 [SD 111.1], CG = 35.4 [SD 81.1], $p < .05$). In the study by Bell et al. (2014), differences were only shown in the subgroup of low community performance (IG = 230.4 [SD

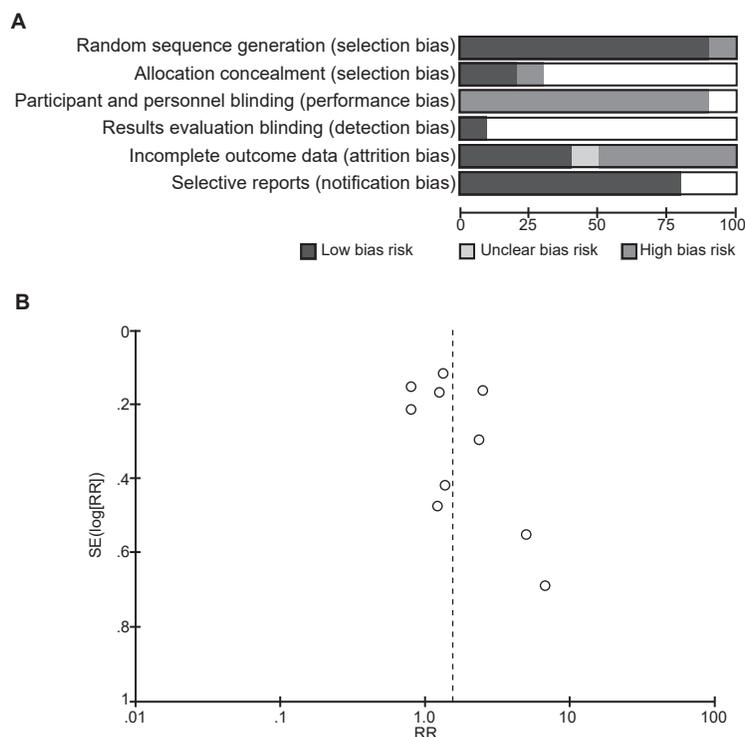


Figure 2. Evaluation of bias of selected articles. A) Rater assessment; B) Funnel diagram to illustrate publication bias.

399.7] vs. CG = 145.3 [*SD* 441.1], $p < .01$). No differences were reported in three studies (Craig et al., 2014; Glynn et al., 2017; McGurk et al., 2009) and this variable was not evaluated in four studies (Au et al., 2015; McGurk et al., 2007; Tsang et al., 2009; Tsang et al., 2010).

Weeks worked

Three studies reported more weeks worked in the augmented IPS groups: the one by McGurk et al. (2007) (IG = 27 [*SD* 37.2], CG = 5.4 [*SD* 21.1], $p < .001$), with a follow-up rate of 50% at 26 months; the one by Killackey et al. (2008) (IG = 8.6 [*SD* 9.2], CG = 3.8 [*SD* 10.1], $p < .05$), analyzed during the time of the intervention (6 months); and the study by Tsang et al. (2009), in a 15-month follow-up (IG = 23.8 [*SD* 17.5], CG based on IPS:12.3 [*SD* 16], CG vocational rehabilitation services: 1.1 [*SD* 4.5], $p < .001$). Four studies reported no effect in favor of the intervention group (Au et al., 2015; Craig et al., 2014; Glynn et al., 2017; McGurk et al., 2009).

Salary

Two studies reported salary differences in favor of augmented IPS interventions: the one by McGurk et al. (2007) (IG = \$5 320.2 [*SD* 8723.2], CG = \$530.2 [*SD* 2105.9], $p < .001$); and the one by Killackey et al. (2008) (IG = \$3 526 [*SD* 4016], CG = \$2 865 [*SD* 9886], $p < .05$). Five studies found no statistically significant differences between the interven-

tion groups (Au et al., 2015; Glynn et al., 2017; McGurk et al., 2009; Tsang et al., 2009; Tsang et al., 2010) and another three were not evaluated (Bell et al., 2014; Bell et al., 2008; Craig et al., 2014).

Other comparisons

Given the clinical and age heterogeneity between those with schizophrenia and those with a first psychotic episode, the result of the meta-analysis is presented by random effects in each diagnostic category. Figure 3 shows that, among people with schizophrenia, there is no effect in favor of augmented IPS interventions compared to control groups ($RR = 1.37$, 95% CI [.97, 1.95]). Conversely, the effect does occur in the first psychotic episode group ($RR = 3.35$, 95% CI [1.23, 9.13]). However, it should be noted that only two studies were included in this comparison (Figure 3). On the other hand, a meta-analysis was performed among the interventions based on cognitive remediation ($n = 5$), but no statistically significant effect was observed in favor of augmented IPS interventions compared to control interventions ($RR = 1.33$, 95% CI [.85, 2.10]).

DISCUSSION AND CONCLUSION

The analysis of augmented IPS interventions fails to show greater effectiveness compared with usual care interven-

Table 2
Comparison of outcomes between augmented IPS interventions

Author and year (country)	Percentages of competitive jobs	Average hours worked per week (standard deviation)	Average weeks worked (standard deviation)	Salary averages in dollars (standard deviation)
McGurk et al., 2007 (USA)	IG = 69.6%, CG = 14.3% ($p < .001$)	Not assessed	IG = 27 (SD 37.2), CG = 5.4 (SD 21.1) ($p < .001$)	IG = \$5,320.2 (SD 8723.2) CG = \$530.2 (SD 2105.9) ($p < .001$)
Killackey et al., 2008; Baksheev et al., 2012 (Australia)	IG = 65%, CG = 9.5%	IG = 33.9 (SD 15.5) CG = 22.5 (SD 10.6) ($p < .01$)	IG = 8.6 (SD 9.2) CG = 3.8 (SD 10.1) ($p = .05$)	Total: IG = \$3,526 (SD 4016) CG = \$2865 (SD 9886) ($p = .012$) (converted from Australian dollars)
Bell et al., 2008 (USA)	24 months: IG = 28.9, CG = 20.6 (NS)	Initial: IG = 11.9 (SD 28.6) CG = 11.3 (SD 37.7) Final: IG = 59.2 (SD 111.1) CG = 35.4 (SD 81.1) ($p < .05$)	A year: IG = 20.3 (SD 16) IG = 22.1 (SD 16.0)	Not assessed
Tsang et al., 2009 (China)	7 months: IG = 59.6%, CG1 = 30.4%, CG2 = 1.8% ($p < .001$) 11 months: IG = 75%, CG1 = 42.9%, CG2 = 7.3% ($p < .001$) 15 months: IG = 78.8%, CG1 = 53.6%, CG2 = 7.3% ($p < .001$)	Not assessed	7 months: IG = 8.3 (SD 8.5), CG1 = 4.5 (SD 6.6), CG2 = 0 (SD 0) 11 months: IG = 16.4 (SD 13.4), CG1 = 9.7 (SD 12.2), CG2 = .6 (SD 2.3) 15 months: IG=23.8 (SD 17.5), CG1=12.3 (SD 16), CG2= 1.1 (SD 4.5) ($p < .001$)	7 months: IG = 24.6 (SD 9.8) CG1 = 25.9 (SD 11.6) CG2 = NA 11 months: IG = 25.6 (SD 9.3) CG1 = 21.0 (SD 7.6) CG2 = NA 15 months: IG = 26.1 (SD 9.6) CG1 = 22.9 (SD 8.7) CG2 = NA ($p < .07$)
McGurk et al., 2009 (USA)	IG = 39%, CG = 31% (NS)	IG = 213.6 (SD 417.1) CG = 151 (SD 250.5) ($p = .701$)	IG = 10.4 (SD 16.4) CG = 9.3 (SD 15.5) ($p = .868$)	IG = 1,259.9 (SD 2,718.8) CG = 775.1 (SD 1,594.2) ($p = .642$)
Tsang et al., 2010 (China)	7 months: IG = 53.4%, CG = 30.8% ($p < .001$) 39 months: IG = 82.8%, CG = 61.5 ($p < .01$)	Not assessed	Not assessed	The salary is not reported in dollars, but the authors report that there was no difference between the groups
Craig et al., 2014 (England)	6 months: IG = 33%, CG = 12%, ($p < .01$) 12 months: IG = 43%, CG = 18%, ($p < .01$)	IG = median 30 (ICR = 19 - 37.5) ($p = .82$) CG = median 37.5 (ICR = 16 - 37.5)	IG = mean 9.28 CG = mean 16.7 ($p = .32$)	Not assessed
Bell et al., 2014 (USA)	IG = 52%, CG = 40% ($p = .11$) Low: IG = 49%, CG = 20% ($p < .005$) High: IG = 54%, CG = 62% ($p = .45$)	Low: IG = 230.4 (SD 399.7) vs. CG = 145.3 (SD 441.1) ($p = .01$) High: IG = 316.3 (SD 567.3) vs. CG = 388.8 (SD 504.5) ($p = .24$)	Not assessed	Not assessed
Glynn et al., 2017 (USA)	IG = 55%, CG = 64.2%	IG = 13.2 (SD 9.6) CG = 16.8 (SD 8.1) ($p = .09$)	IG = 41.4 (SD 37.5) CG = 51.5 (SD 31.1) ($p = .66$)	IG = \$4,328.3 (SD 5190.8) CG = \$6,471.8 (SD 4251.8) ($p = .33$)
Au et al., 2015; Tsang et al., 2016 (China)	7 months: IG = 22.2%, CG = 28.9% 11 months: IG = 44.4%, CG = 55.6% 15 months: IG = 60.6, CG = 62.2% (NS)	Not assessed	7 months: IG = 8.5%, CG = 8.7 ($p < .05$) 11 months: IG = 13.3, CG = 12.9 (NS)	7 months: IG = 34.6, CG = 36 11 months: IG = 42.3 CG = 36.3 (NS) (hourly salary in Hong Kong dollars)

Note: IG = intervention group, CG = control group, Low IG or CG = Intervention group with low QLS score, High IG or CG = Group of intervention with high QLS score, GIL or GCL = Groups in London, GIM or GCM = Groups in the Midlands, ICR= inter quartile range, NA = not applicable because vocational outcomes were evaluated, NS = no statistical significance.

tions in people with schizophrenia. However, it should be considered that in most studies, the comparison groups had interventions based on the standard IPS model. Accordingly, it cannot be concluded that the augmented intervention

is a better alternative to a standard IPS model designed to obtain competitive employment. On the other hand, there seems to be an effect in favor of interventions aimed at young people with a first psychotic episode. However, the

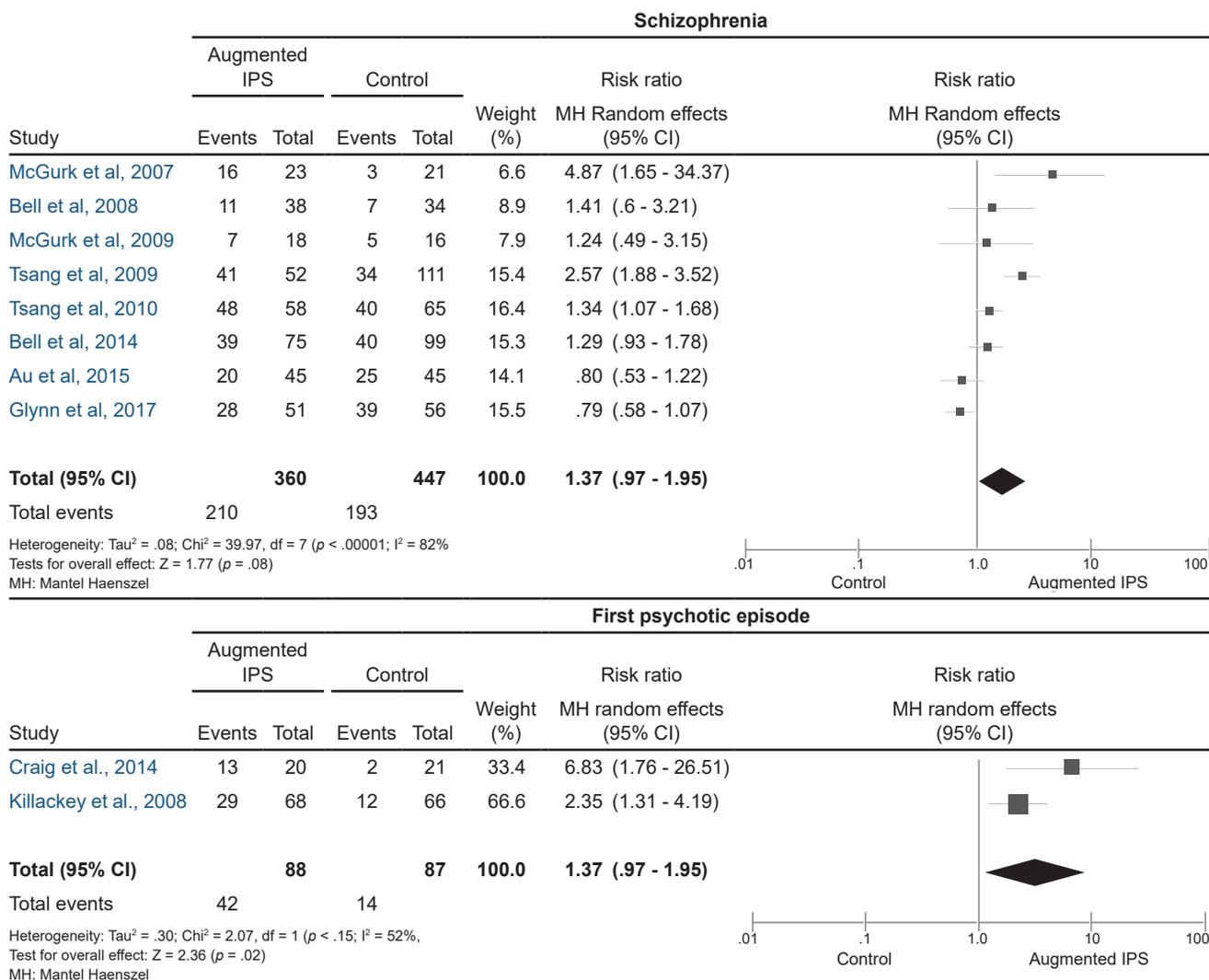


Figure 3. Comparison by diagnosis of augmented IPS interventions with other interventions to secure competitive employment.

small number of studies suggests that this result should be viewed with caution. Nevertheless, it is reasonable to consider that early interventions will mean greater long-term benefits and that, given the clinical and sociodemographic characteristics of this age group, the treatment goal should include outcomes that are not only job-related, but also academic.

Previous meta-analysis (Carmona et al., 2017; Kinoshita et al., 2013; Modini et al., 2016; Suijkerbuijk et al., 2017) have consistently reported the positive effect of standard IPS interventions in work outcomes. However, very few of them have evaluated the effect of augmented IPS interventions, given that the heterogeneity of the interventions makes it difficult to compare. At the same time, stratified analysis by diagnosis have not been reported. Regarding the negative results of the present study, it should be recalled that the analysis technique used (random effects

model) makes more conservative estimates, meaning that the positive effect disappears more than it would with a fixed effects model.

One of the most important limitations of this meta-analysis is related to the heterogeneity of augmented IPS interventions. Despite the fact that most of them used cognitive remediation, this was carried out through various computer programs and with different duration schemes, which makes it difficult to standardize the process and results. It is also necessary to consider losses in long-term follow-up, even in studies that achieved high rates of competitive employment. For example, in the work of McGurk et al. (2007), the follow-up rate at 26 months was 50%. Also, it was not taken into account conditions such as severity and stability of the condition, the role of other relevant variables, baseline cognitive status measured through standardized tests (such as MATRICS cognitive assessment battery), the role of the

family (Gold et al., 2006), or any other conditions that could be possible effect modifiers. For example, the meta-analysis conducted by Metcalfe, Drake, and Bond (2018), in which they evaluated the impact of local factors on the likelihood that IPS recipients would obtain competitive employment, compared to those who received alternative vocational services. The authors determined that changes in the Gross Domestic Product, local unemployment, labour union rates, labour benefits, level of compensation of disability benefits, as well as efforts to integrate people with disabilities into the workforce, can serve as barriers or facilitators of the effectiveness of the IPS.

Regarding the applicability of the augmented IPS, it is necessary to consider the context of the interventions, since they are usually spaces where the effectiveness of the IPS model has already been proven and, therefore, when another psychosocial intervention is added, this is done in order to increase its effectiveness, particularly in the long-term. It should also be taken into account that both IPS and the augmented IPS models depend partly on the conviction, faith, and trust of the mental health providers in their application. Consequently, motivational interventions (e.g., motivational interview) as a model for resolving the ambivalence of providers, has shown a considerable effect (Craig et al., 2014).

The fact that the interventions are more effective in the first psychotic episode proves the importance of early interventions. However, in these age groups, alternatives involving a combination with vocational interventions, where the person determines whether the goal is competitive work or the resumption of study, should also be taken into account. Moreover, it should be pointed out that since not all of those who have a first psychotic episode will develop schizophrenia, early interventions in this population will obviously have a better outcome. In first psychotic episode, there are studies evaluating augmented IPS interventions that incorporate vocational components. However, they were excluded from the review since the objective of this review is focused on competitive employment outcomes (Baksheev et al., 2012; Rinaldi, Perkins, McNeil, Hickman, & Singh, 2010; Rosenheck et al., 2017).

Suggestions to be considered in future research include cost-effectiveness studies on augmented IPS interventions, as well as the study of effect modifiers, in order to determine which characteristics of the intervention or the participants are associated with the greatest effect, since certain conditions such as cognitive impairment (the main complication in severe psychotic disorders) could require attention prior to reincorporation into school or work.

At the same time, there is a need to redirect the mental health budget, since it is currently applied predominantly to the management of acute psychotic episodes. It is therefore necessary to determine the extent to which investment in rehabilitation interventions provides social and economic

benefits for families, institutions, and society in general. Although the effectiveness of the implementation of complex interventions in routine mental health services has been proven—such as the *Social Security Disability Insurance* (SSDI) intervention, which provides supported employment, medication management, and health services, in addition to full health insurance coverage (without out-of-pocket expenses) (Drake et al., 2013), in the Latin American context—, there is a delay in the implementation of these interventions, meaning that it is necessary to involve government institutions and the private sector to open up sensitized work spaces.

It is essential to reduce discrimination in the workplace, since this can determine whether employment has positive effects in terms of self-stigma and stress among people with mental illness (Rüsch et al., 2014). It is therefore necessary to implement interventions to reduce discrimination at work and improve the resources of people with schizophrenia to increase the positive effects of employment (Rüsch et al., 2014). It is also necessary to identify the skills and attitudes of health personnel and organizational and health system barriers is also necessary (Mueser, Drake, & Bond, 2016).

The IPS model requires an integrated, well-trained and proactive team, which spends most of its time providing personalized support for people with severe mental illness in seeking, obtaining, and maintaining employment. It is necessary to reorient the skills of mental health professionals (medical doctors, psychologists, nurses, and social workers) in order to establish employment as a central objective of rehabilitation and to assess results continuously and critically.

This review adds value to the study of IPS-based interventions and underscores the heterogeneity of augmented IPS interventions and their effects on work outcomes. It also shows that standard IPS interventions are the current basis for the promotion of competitive employment in people with schizophrenia and other psychoses, and that they should be carried out in an early manner. The recovery process should prioritize work and vocational outcomes in the usual mental health care services. This entails the restructuring of services, with a new attitude towards the promotion of a mental health system oriented towards the functional recovery of people living with severe mental disorders.

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Conflict of interests

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REFERENCES

- Au, D. W., Tsang, H. W., So, W. W., Bell, M. D., Cheung, V., Yiu, M. G., ... Lee, G. T. (2015). Effects of integrated supported employment plus cognitive remediation training for people with schizophrenia and schizoaffective disorders. *Schizophrenia Research*, 166(1-3), 297-303. doi: 10.1016/j.schres.2015.05.013
- Baksheev, G. N., Allott, K., Jackson, H. J., McGorry, P. D., & Killackey, E. (2012). Predictors of vocational recovery among young people with first-episode psychosis: findings from a randomized controlled trial. *Psychiatric rehabilitation journal*, 35(6), 421-427. doi: 10.1037/h0094574
- Becker, D. R. & Drake, R. E. (1993). A working life: the individual placement and support (IPS) program. Concord NH: New Hampshire-Dartmouth Psychiatric Research Center.
- Bell, M. D., Choi, K. H., Dyer, C., & Wexler, B. E. (2014). Benefits of cognitive remediation and supported employment for schizophrenia patients with poor community functioning. *Psychiatric Services*, 65(4), 469-475. doi: 10.1176/appi.ps.201200505
- Bell, M. D., Zito, W., Greig, T., & Wexler, B. E. (2008). Neurocognitive enhancement therapy with vocational services: work outcomes at two-year follow-up. *Schizophrenia Research*, 105(1-3), 18-29. doi: 10.1016/j.schres.2008.06.026
- Bond, G. R., Drake, R. E., Mueser, K. T., & Becker, D. R. (1997). An update on supported employment for people with severe mental illness. *Psychiatric Services*, 48(3), 335-346. doi: 10.1176/ps.48.3.335
- Bond, G. R., Peterson, A. E., Becker, D. R., & Drake, R. E. (2012). Validation of the Revised Individual Placement and Support Fidelity Scale (IPS-25). *Psychiatric Services*, 63(8), 758-763. doi: 10.1176/appi.ps.201100476
- Bouwman, C., de Sonnevill, C., Mulder, C. L., & Hakkaart-van Roijen, L. (2015). Employment and the associated impact on quality of life in people diagnosed with schizophrenia. *Neuropsychiatric Disease and Treatment*, 11, 2125-2142. doi: 10.2147/ndt.s83546
- Carmona, V. R., Gomez-Benito, J., Huedo-Medina, T. B., & Rojo, J. E. (2017). Employment outcomes for people with schizophrenia spectrum disorder: A meta-analysis of randomized controlled trials. *International Journal of Occupational Medicine and Environmental Health*, 30(3), 345-366. doi: 10.13075/ijomh.1896.01074
- Cloutier, M., Aigbogun, M. S., Guerin, A., Nitulescu, R., Ramanakumar, A. V., Kamat, S. A., ... François, C. (2016). The Economic Burden of Schizophrenia in the United States in 2013. *The Journal of Clinical Psychiatry*, 77(6), 764-771. doi: 10.4088/JCP.15m10278
- Craig, T., Shepherd, G., Rinaldi, M., Smith, J., Carr, S., Preston, F., & Singh, S. (2014). Vocational rehabilitation in early psychosis: cluster randomised trial. *The British Journal of Psychiatry*, 205(2), 145-150. doi: 10.1192/bjp.bp.113.136283
- Charzynska, K., Kucharska, K., & Mortimer, A. (2015). Does employment promote the process of recovery from schizophrenia? A review of the existing evidence. *International Journal of Occupational Medicine and Environmental Health*, 28(3), 407-418. doi: 10.13075/ijomh.1896.00341
- Chong, H. Y., Teoh, S. L., Wu, D. B., Kotirum, S., Chiou, C. F., & Chaiyakunapruk, N. (2016). Global economic burden of schizophrenia: a systematic review. *Neuropsychiatric Disease and Treatment*, 12, 357-373. doi: 10.2147/ndt.s96649
- Drake, R. E. & Whitley, R. (2014). Recovery and severe mental illness: description and analysis. *The Canadian Journal of Psychiatry*, 59(5), 236-242. doi: 10.1177/070674371405900502
- Drake, R. E., Frey, W., Bond, G. R., Goldman, H. H., Salkever, D., Miller, A., ... Milfort, R. (2013). Assisting Social Security Disability Insurance beneficiaries with schizophrenia, bipolar disorder, or major depression in returning to work. *American Journal of Psychiatry*, 170(12), 1433-1441. doi: 10.1176/appi.ajp.2013.13020214
- Drake, R. E., Bond, G. R., & Becker, D. R. (2012). *Individual Placement and Support. An Evidence-Based Approach to Supported Employment*. New York: Oxford University Press.
- Drake, R. E., McHugo, G. J., Bebout, R. R., Becker, D. R., Harris, M., Bond, G. R., & Quimby, E. (1999). A randomized clinical trial of supported employment for inner-city patients with severe mental disorders. *Archives of General Psychiatry*, 56(7), 627-633.
- Drake, R. E. & Becker, D. R. (1996). The individual placement and support model of supported employment. *Psychiatric Services*, 47(5), 473-475.
- Glynn, S. M., Marder, S. R., Noordsy, D. L., O'Keefe, C., Becker, D. R., Drake, R. E., & Sugar, C. A. (2017). An RCT Evaluating the Effects of Skills Training and Medication Type on Work Outcomes Among Patients With Schizophrenia. *Psychiatr Services*, 68(3), 271-277. doi: 10.1176/appi.ps.201500171
- Gold, P. B., Meisler, N., Santos, A. B., Carnemolla, M. A., Williams, O. H., & Keleher, J. (2006). Randomized trial of supported employment integrated with assertive community treatment for rural adults with severe mental illness. *Schizophrenia Bulletin*, 32(2), 378-395. doi: 10.1093/schbul/sbi056
- Harvey, P. D., Heaton, R. K., Carpenter, W. T., Jr., Green, M. F., Gold, J. M., & Schoenbaum, M. (2012). Functional impairment in people with schizophrenia: focus on employability and eligibility for disability compensation. *Schizophrenia Research*, 140(1-3), 1-8. doi: 10.1016/j.schres.2012.03.025
- Higgins, J. P. T. & Green, S. (2011). *Cochrane Handbook for Systematic Reviews of Interventions*. Chichester Wiley-Blackwell: Cochrane Collaboration.
- Killackey, E., Jackson, H. J., & McGorry, P. D. (2008). Vocational intervention in first-episode psychosis: individual placement and support v. treatment as usual. *The British journal of psychiatry*, 193(2), 114-120. doi: 10.1192/bjp.bp.107.043109
- Kinoshita, Y., Furukawa, T. A., Kinoshita, K., Honyashiki, M., Omori, I. M., Marshall, M., ... Kingdon, D. (2013). Supported employment for adults with severe mental illness. *Cochrane Database System Review*, 9, CD008297.
- Luciano, A., Bond, G. R., & Drake, R. E. (2014). Does employment alter the course and outcome of schizophrenia and other severe mental illnesses? A systematic review of longitudinal research. *Schizophrenia Research*, 159(2-3), 312-321. doi: 10.1016/j.schres.2014.09.010
- McGurk, S. R., Mueser, K. T., DeRosa, T. J., & Wolfe, R. (2009). Work, recovery, and comorbidity in schizophrenia: a randomized controlled trial of cognitive remediation. *Schizophrenia Bulletin*, 35(2), 319-335. doi: 10.1093/schbul/sbn182
- McGurk, S. R., Mueser, K. T., Feldman, K., Wolfe, R., & Pascaris, A. (2007). Cognitive training for supported employment: 2-3 year outcomes of a randomized controlled trial. *American Journal of Psychiatry*, 164(3), 437-441. doi: 10.1176/ajp.2007.164.3.437
- McGurk, S. R., Mueser, K. T., & Pascaris, A. (2005). Cognitive training and supported employment for persons with severe mental illness: one-year results from a randomized controlled trial. *Schizophrenia Bulletin*, 31(4), 898-909. doi: 10.1093/schbul/sbi037
- Metcalfe, J. D., Drake, R. E., & Bond, G. R. (2018). Economic, Labor, and Regulatory Moderators of the Effect of Individual Placement and Support Among People With Severe Mental Illness: A Systematic Review and Meta-analysis. *Schizophrenia Bulletin*, 44(1), 22-31. doi: 10.1093/schbul/sbx132
- Modini, M., Tan, L., Brinchmann, B., Wang, M. J., Killackey, E., Glozier, N., ... Harvey, S. B. (2016). Supported employment for people with severe mental illness: systematic review and meta-analysis of the international evidence. *The British Journal of Psychiatry*, 209(1), 14-22. doi: 10.1192/bjp.bp.115.165092
- Mueser, K. T., Drake, R. E., & Bond, G. R. (2016). Recent advances in supported employment for people with serious mental illness. *Current Opinion in Psychiatry*, 29(3), 196-201. doi: 10.1097/ycp.0000000000000247
- Mueser, K. T., Aalto, S., Becker, D. R., Ogden, J. S., Wolfe, R. S., Schiavo, D., ... Xie, H. (2005). The effectiveness of skills training for improving outcomes in supported employment. *Psychiatric Services*, 56(10), 1254-1260. doi: 10.1176/appi.ps.56.10.1254
- Rinaldi, M., Perkins, R., McNeil, K., Hickman, N., & Singh, S. P. (2010). The Individual Placement and Support approach to vocational rehabilitation for young people with first episode psychosis in the UK. *Journal of Mental Health*, 19(6), 483-491. doi: 10.3109/09638230903531100
- Rosenheck, R., Mueser, K. T., Sint, K., Lin, H., Lynde, D. W., Glynn, S. M., ... Kane, J. M. (2017). Supported employment and education in comprehensive, integrated care for first episode psychosis: Effects on work, school, and disability income. *Schizophrenia Research*, 182, 120-128. doi: 10.1016/j.schres.2016.09.024
- Rüsch, N., Nordt, C., Kawohl, W., Brantschen, E., Bartsch, B., Müller, M., ... Rössler, W. (2014). Work-related discrimination and change in self-stigma among people with mental illness during supported employment. *Psychiatric Services*, 65(12), 1496-1498. doi: 10.1176/appi.ps.201400073

- Suijkerbuijk, Y. B., Schaafsma, F. G., van Mechelen, J. C., Ojarvi, A., Corbiere, M., & Anema, J. R. (2017). Interventions for obtaining and maintaining employment in adults with severe mental illness, a network meta-analysis. *Cochrane Database System Review*, 9, CD011867. doi: 10.1002/14651858.CD011867.pub2
- Tsang, H. W., Bell, M. D., Cheung, V., Tam, K. L., & Yeung, W. S. (2016). Integrated supported employment plus cognitive remediation training for people with schizophrenia. *Hong Kong Medical Journal*, 22(2), S15-S18.
- Tsang, H. W., Fung, K. M., Leung, A. Y., Li, S. M., & Cheung, W. M. (2010). Three year follow-up study of an integrated supported employment for individuals with severe mental illness. *Australian and New Zealand Journal of Psychiatry*, 44(1), 49-58. doi: 10.3109/00048670903393613
- Tsang, H. W., Chan, A., Wong, A., & Liberman, R. P. (2009). Vocational outcomes of an integrated supported employment program for individuals with persistent and severe mental illness. *Journal of Behavior Therapy and Experimental Psychiatry*, 40(2), 292-305. doi: 10.1016/j.jbtep.2008.12.007
- Van Rijn, R. M., Carlier, B. E., Schuring, M., & Burdorf, A. (2016). Work as treatment? The effectiveness of re-employment programmes for unemployed persons with severe mental health problems on health and quality of life: a systematic review and meta-analysis. *Occupational & Environmental Medicine*, 73(4), 275-279. doi: 10.1136/oemed-2015-103121
- Wallace, C. J. & Tauber, R. (2004). Supplementing supported employment with workplace skills training. *Psychiatric Services*, 55(5), 513-515. doi: 10.1176/appi.ps.55.5.513