



A Systematic Review and Meta-analysis of IPS Supported Employment for Young Adults with Mental Health Conditions

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Abstract

Young adults with mental health conditions want to work and advance their education, but many need help attaining these goals. Individual Placement and Support (IPS), originally developed for working-age adults with serious mental illness, is an evidence-based employment model that may benefit young adults. This study is the first systematic review and meta-analysis of randomized controlled trials (RCTs) of IPS for this population. We conducted a systematic review of the effectiveness of IPS for young adults with mental health conditions, supplementing our electronic search of the published literature with secondary analyses of two published RCTs. Using meta-analysis, we evaluated employment rate, job duration, and education rate. Seven studies met the inclusion criteria. Four evaluated IPS for young adults with early psychosis and three evaluated IPS for other young adult subgroups. All found a significantly higher employment rate for IPS than the control group. Overall, 208 (58.3%) of 357 IPS participants and 110 (32.4%) of 340 control participants were competitively employed during follow-up, yielding an overall risk ratio of 1.69 (95% CI 1.43, 1.99), $z = 6.24$, $p < 0.001$. Six of the seven studies also reported longer job duration for IPS than the control group, yielding an overall $g = 0.34$ (95% CI 0.09, 0.58), $z = 2.72$, $p < 0.01$. None of four RCTs examining education outcomes found a significant difference favoring IPS, but the overall risk ratio was significant: 1.33 (95% CI 1.06, 1.66), $z = 2.51$, $p < 0.01$. Although the empirical literature is limited, IPS appears to be effective in helping young adults with serious mental illness or early psychosis gain and keep competitive jobs. The impact of IPS on education outcomes is unclear. Future research should evaluate the generalizability of these findings to the broad range of young adults with mental health conditions needing help with their employment goals.

Keywords Individual Placement and Support · IPS · Young adults with mental health conditions · Meta-analysis · Supported employment · Supported education · Employment

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Introduction

Young adults with mental health conditions have high unemployment rates (Drake et al., 2013; Wagner & Newman, 2012), despite their strong desire to work (de Waal et al., 2018; Iyer et al., 2011; Ramsay et al., 2011). Moreover, young adulthood is a developmental stage in which behavioral health problems are common, including the typical onset of psychotic disorders and peak levels of substance use. The literature varies widely in the age range considered young adulthood; a broad range would include ages 16 to 30. In 2019, 9.9 million young adults in the U.S. aged 18 to 25 reported a mental illness, of which 2.9 million were classified as serious mental illness (29.4% and 8.6%, respectively, of the young adult population), with the prevalence increasing annually over the preceding decade (SAMHSA, 2020). Within this age group, behavioral health conditions are the leading source of disability in the U.S., estimated to be two-thirds of the total burden (Stroud et al., 2015). Subsequently, many young adults experience long-term negative outcomes, including long periods of unemployment, reduced lifetime earnings, poverty, lifelong dependency on disability benefits, and poor psychological health (Arulampalam et al., 2001; Gioia, 2006; Gregg & Tominey, 2005; Ralston et al., 2016; Reine et al., 2004; Sveinsdottir et al., 2018; Topor et al., 2019).

Despite the demonstrated need, few studies have identified effective employment services for the young adult population. Also lacking are recent rigorous reviews of this literature. With one exception, published reviews of employment services for young adults either were published more than a decade ago, have been methodologically uncritical (e.g., inclusion of studies with weak study designs), used broad definitions of target populations with diverse service needs (e.g., inclusion of many disability groups), examined a heterogeneous collection of employment models, and/or have been limited to nonquantitative narrative review methods (Akinola & Dunkley, 2019; Arbesman & Logsdon, 2011; Jetha et al., 2019; Rinaldi et al., 2010; Thompson et al., 2021). The exception was a 2015 review of supported employment services for young adults with a first episode of psychosis, which identified four pre-post evaluations, one quasi-experimental study, and three randomized controlled trials (RCTs) (Bond et al., 2015). The mean outcomes for these studies showed a significantly higher competitive employment rate during follow-up in the supported employment group (49%) than the control group (29%) (d effect size = 0.41), but no difference in education rate for the supported employment group (27%) compared to the control group (33%) (d effect size = -0.13).

The lack of attention to mental health and employment service needs of young adults may be changing. Both in

the U.S. and abroad, governmental initiatives have sought to address these concerns. Examples from the U.S. include federal legislation regarding transition-age youth (Mann & Croake, 2018) and the development of coordinated specialty care programs for early psychosis (Dixon, 2017). In Australia, federal funding has permitted the creation of a national network of “headspace centers” for young adults, defined as “easy-access, youth-friendly, integrated primary care services” (Rickwood et al., 2019).

Other reasons for promoting effective employment services for young adults include the growing recognition of employment as a social determinant of health (Drake & Wallach, 2020; Gibbons & Salkever, 2019), their strong interest in work and school (de Waal et al., 2018), and the motivational role of vocational services in engaging young adults in treatment (Maraj et al., 2019).

No vocational program has been established as an evidence-based model for young adults with mental health conditions. However, many young adults are served in Individual Placement and Support (IPS) programs, an employment model developed for adults with serious mental illness (Drake et al., 2012). Developed during the 1990s, IPS is based on eight principles: (a) focus on the goal of competitive employment (IPS programs help clients obtain regular jobs in the community); (b) zero exclusion (every client who wants to work is eligible for services regardless of “readiness”); (c) attention to client preferences (services align with clients’ choices, rather than practitioners’ judgments); (d) rapid job search (IPS specialists help clients look for jobs soon after they express interest, rather than providing lengthy pre-employment preparation); (e) targeted job development (based on clients’ interests, IPS specialists build relationships with employers through repeated contact); (f) integration of employment services with mental health treatment (IPS programs closely integrate with mental health treatment teams); (g) personalized benefits counseling (IPS specialists help clients obtain personalized, understandable and accurate information about how working may impact their disability insurance); (h) individualized long-term support (follow-along supports, tailored for the individual, continue for as long as the client wants and needs support).

Over two-dozen RCTs have evaluated the effectiveness of IPS for adults. Numerous meta-analyses have firmly established IPS as an evidence-based practice for adults with serious mental illness (Brinchmann et al., 2020; Frederick & VanderWeele, 2019; Metcalfe et al., 2018a; Modini et al., 2016; Suijkerbuijk et al., 2017) and more recently found effective for many other target groups (Bond et al., 2019a). In most IPS studies, young adults comprise a minority of study participants. IPS studies only rarely provide statistics on the age distribution within the samples.

IPS studies generally have found null or small correlations between age and employment outcomes ($r < 0.15$),

sometimes favoring young adults and other times favoring older adults (Campbell et al., 2010; Catty et al., 2008; Metcalfe et al., 2017, 2018b). Few RCTs of IPS have reported detailed employment outcomes by age. However, one multi-site RCT reported higher competitive employment rates for younger clients (18 to 34) compared to older clients (35 and older) in both the IPS group (69% versus 51%) and the control group (39% versus 33%) (Frey et al., 2011). Similarly, a 43-month follow-up of an RCT of IPS for people with moderate to severe mental illness found that the employment outcomes were stronger for clients under 30 compared to older adults (Holmås et al., 2021). In addition, an IPS RCT for people with mood and anxiety disorders found that younger age was associated with return to work or school within a 24-month period (Hellström et al., 2022).

Historically, most IPS programs have been implemented in community mental health centers and have enrolled working-age adults with serious mental illness. In the last decade, however, program leaders have increasingly developed specialty IPS programs for specific subgroups of the young adult population, including homeless youth with mental illness (Ferguson et al., 2012), youth transitioning from the foster care system (Ellison et al., 2015), high school students with mental health problems (Noel et al., 2018), and young adults attending drop-in centers who are experiencing a wide range of mental health symptoms (KPMG, 2019). These programs include young adults with a wide range of psychiatric diagnoses not limited to serious mental illness.

Unlike the literature on IPS for the general adult population, we found no recent systematic reviews targeting the literature on IPS for young adults. We therefore conducted a systematic review of evaluations of IPS interventions for young adults with mental health conditions. Our goals were to describe the scope and methodological quality of the IPS literature for young adults and to assess the overall effectiveness of IPS for increasing employment outcomes using meta-analysis. A secondary goal was to assess the effectiveness of IPS for increasing education outcomes.

Methods

Study Inclusion Criteria

We included empirical studies meeting the following inclusion criteria:

- Randomized controlled trial
- Evaluated IPS
- Published in the English language
- Included participants identified as young adults or transition-age youth. We did not restrict our search by age range because a lack of consensus in the literature.

- Included participants with a mental health condition or at risk of developing a mental health condition, such as young adults with a first-episode psychosis (FEP).
- Sample size of at least 10 participants
- Assessed competitive employment outcomes

We did not limit the range of years of publication. We also did not restrict the search to evaluation of specialty IPS programs for young adults only; that is, we included subanalyses of larger studies of standard IPS programs serving the working-age adult population.

Search Procedures

We used both formal and informal search methods. For the formal search, we conducted a systematic review following PRISMA guidelines (<https://www.prismastatement.org>), using a registered protocol on PROSPERO (CRD42020158496) (<https://www.crd.york.ac.uk/prospero/#searchadvanced>). We searched the following databases: PubMed, Google Scholar, PsycINFO, CINAHL, and Scopus in September 2019, with an updated search in March 2022. The search terms we used were combinations of “young adult,” OR “youth,” AND “individual placement and support,” OR “supported employment” without selecting specific fields. An additional informal search involved notifications from various listservs that provide references for newly published articles on IPS (Google Scholar Alert; Mathematica's CSDP Disability Research Consortium). We also examined reference lists of previous systematic reviews and other pertinent articles. We used Covidence (<https://www.covidence.org>), a web-based screening and data extraction tool, to create a database of citations and abstracts.

The search process included two screens. First, two authors independently assessed each individual title and abstract, excluding papers that did not meet inclusion criteria. Second, we examined the full text of studies included after the first screen. A third author adjudicated disagreements. The level of agreement between the two authors in their independent analysis during the initial screening was 87%. In the second round (full text review), the level of agreement between the two authors was 94%. In the case of multiple publications based on a single study, we used the first publication reporting the main findings, supplemented as appropriate with other publications (such as reports of long-term follow-up).

Finally, to increase the pool of studies included in the review, we contacted the primary investigators for two published RCTs of IPS that included young adults with mental health conditions within their sample. These two investigators agreed to conduct secondary analyses of their datasets focused on the target group for this review, which we added to our meta-analysis.

Data Extraction

One author created a spreadsheet, recording pertinent data from each study. The spreadsheet included employment and education outcomes, background characteristics of study samples, and methodological details, including study design, sample size, length of follow-up, and IPS fidelity. A second author reviewed the spreadsheet for accuracy.

Measurement

The primary outcome was *competitive employment rate* during follow-up, defined as 1 day or more of competitive employment during the follow-up period. Competitive employment is defined as a regular community job in an integrated setting paying at least minimum wage and not a set-aside job for people with disabilities.

For studies including some participants who were employed at baseline, we also examined adjusted employment rate, calculated as the total employed at follow-up minus the number employed at baseline divided by the total sample at follow-up minus the number employed at baseline. This proportion is an estimate of the number of unemployed people at baseline who gained employment during follow-up.

We also examined *job duration*, which has been assessed in various ways in the published literature, including months, days, or hours worked. The duration outcomes were calculated on the total sample (which included participants who did not work).

A secondary outcome was *education rate* during follow-up, defined as 1 day or more attendance in an educational program. Education was defined as enrollment in coursework in a mainstream educational setting (that is, not a class restricted to people with disabilities). Most studies do not report achievement of milestones such as completion of coursework or graduation, thus we could not examine education milestones. We also examined adjusted education rate, calculated in a similar fashion as adjusted employment rate.

Finally, some research has used a *combined employment/education rate* measure, defined as the percentage of participants who worked and/or were in school during follow-up. Outside of employment and education, the studies included in this review did not use the same measures for any other outcomes.

We used the definition of follow-up period for the outcomes as reported in the original studies. One study reported 6-month outcomes as primary, because the IPS program provided IPS services for 6 months only (Killackey et al., 2019). Two studies reported outcomes in increments of 6-month intervals; in both cases we examined outcomes for the last

follow-up period (Erickson et al., 2021; Nuechterlein et al., 2020). The other four studies had a single follow-up period.

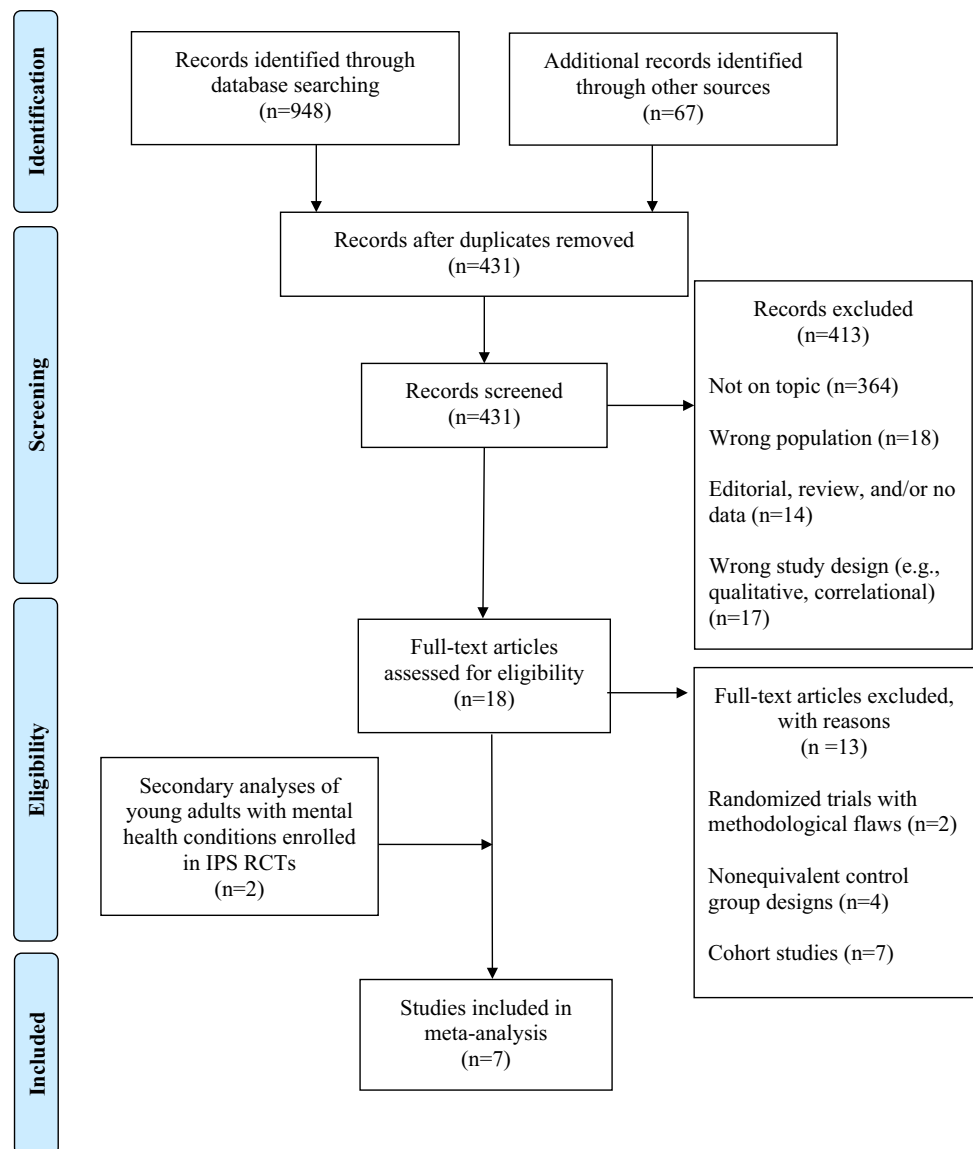
Statistical Analysis

We report descriptive statistics (frequencies, percentages, means, and standard deviations) as reported or calculated from information in published studies. For the primary analyses, we used the same effect size measure (the risk ratio) as did two previous IPS meta-analyses (Brinchmann et al., 2020; Modini et al., 2016) to facilitate comparisons with the literature. Using the Stata 17 software (StataCorp, 2021), we conducted meta-analyses using the risk ratio for the two dichotomous measures (employment rate and education rate) and Hedge's g for the job duration measure. Hedge's g is conceptually identical to Cohen's d (1988) and gives numerically similar results. The statistical model for the meta-analysis was the random-effects restricted maximum likelihood model, following recommendations of several sources (Kelley & Kelley, 2012; Kontopantelis & Reeves, 2010). The Stata software produces forest plots showing effect sizes (with 95% confidence intervals) for each study and an overall effect size (risk ratio or g) weighted by sample size, a z -score test of significance, and several tests of heterogeneity, including the I^2 statistic. I^2 ranges from 0 to 100% with higher percentages indicating greater heterogeneity; 50% or more indicates substantial heterogeneity among the risk ratios for the individual studies. Finally, to estimate the d effect size for differences between the IPS and control groups on overall employment and education rates, we used the arc sine transformation method (Lipsey, 1990).

Results

Search Results

The PRISMA diagram shown in Fig. 1 summarizes the number of papers identified and excluded at each stage. We identified 5 studies for inclusion through the electronic literature search and added two unpublished secondary analyses of RCTs examining subgroups of young adults with mental health conditions. Of the 7 included studies, 4 were RCTs of IPS for young adults with early psychosis (Erickson et al., 2021; Killackey et al., 2008, 2019; Nuechterlein et al., 2020), and 3 were RCTs for other young adult subgroups (Bond et al., 2016; Christensen et al., 2019; Sveinsdottir et al., 2020), as shown in Table 1.

Fig. 1 PRISMA diagram

Study Characteristics

The seven RCTs had a total sample size at follow-up of 697. Follow-up periods ranged from 6 months (one study), 12 months (three studies), 18 months (three studies). Five of the 7 RCTs reported good fidelity using a standard IPS fidelity scale. The following sections describe the methodological details for studies within each of these types of studies.

Randomized Controlled Trials—Early Psychosis Studies

Killackey et al. (2008) compared IPS to usual services for clients with a first episode of psychosis receiving clinical services through the Early Psychosis Prevention and Intervention Centre in Melbourne, Australia. IPS services were limited to 6 months. In a subsequent RCT, Killackey et al.

(2019) examined employment and education outcomes over an 18-month period, although IPS services again were limited to 6 months. Because of the 6-month period of IPS services, we used the 6-month employment rate in the analyses below.

In an RCT conducted in Los Angeles, Nuechterlein et al. (2020) evaluated IPS compared to referral to VR. Both groups received individualized clinical services and social skills training. Unlike in most IPS studies, participants completed a medication stabilization period, typically about 3 months, prior to study enrollment.

Erickson et al. (2021) conducted an RCT assessing IPS for young adults enrolled in a first episode psychosis service program over a geographically dispersed region of British Columbia, Canada. Using a hub and spoke framework, 3 regional “hubs” provided IPS services while 12

Table 1 Evaluations of IPS for transition-age young adults: methodological details

Primary investigator	Target population	Age (mean / range)	Study design	Baseline sample size	Length of follow-up	Vocational models	IPS fidelity
<i>Randomized controlled trials—early psychosis studies</i>							
Killackey et al. (2008)	First episode of psychosis	Mean = 21.4	RCT	41	6 months	IPS vs. TAU	Good fidelity
Killackey et al. (2019)	First episode of psychosis	Mean = 20.4	RCT	146	6 months	IPS vs. TAU	Good fidelity
Nuechterlein et al. (2020)	First episode of psychosis	Mean = 24.5	RCT	69	18 months	IPS vs. TAU	Good fidelity
Erickson et al. (2021)	First episode of psychosis	Mean = 23	RCT	109	12 months	IPS vs. TAU	Good fidelity
<i>Secondary analyses of randomized controlled trials—other young adult subgroups</i>							
Bond et al. (2016)	Young adults enrolled in CMHCs	21–29	Subgroup analysis of 4 IPS RCTs	109	18 months	IPS vs. active vocational interventions	Good fidelity
Christensen et al. (2019)	Subgroup of young adults with serious mental illness	18–30	RCT	230	18 months	IPS vs. TAU	“Moderate adherence”
Sveinsdottir et al. (2020)	NEET subgroup with psychiatric symptoms	18–29	RCT	43	12 months	IPS vs. shelter workshop	Fair fidelity

CMHC community mental health center, *Ctl* control, *FEP* first episode of psychosis, *IPS* Individual Placement and Support, *MH* mental health, *NEET* not in employment, education, or training, *ns* not significant, *RCT* randomized controlled trial, *SE* supported employment, *TAU* treatment as usual

“spokes” (community mental health centers) provided clinical services.

Randomized Controlled Trials—Other Young Adult Subgroups

Nearly all the RCTs of IPS for the general adult population of people with serious mental illness include young adults. However, few published RCTs have examined outcomes for young adult subgroups. One exception is a secondary analysis of a dataset consisting of individual participant-level data from four published RCTs of working-age adults with serious mental illness enrolled in community mental health treatment (Bond et al., 2016). This secondary analysis examined outcomes for participants under the age of 30.

Another included study was a secondary analysis from a Danish RCT of IPS for 720 working-age adults with serious mental illness. The parent study evaluated IPS in a three-group design: standard IPS, IPS supplemented with cognitive remediation, and services as usual (Christensen et al., 2019). For this review we excluded the findings for the IPS + cognitive remediation group. The secondary analysis examined outcomes for 230 participants between 18 and 30 years of age, including 161 participants enrolled in OPUS, a first episode psychosis service program (70% of the young adult subgroup) (Christensen, 2021). For

employment outcomes, the analyses examined data from the Danish national income register for the full sample of 230 participants. The analyses of education and combined employment/education outcomes used the interview sample ($N = 164$), excluding 66 participants who did not complete the follow-up interview.

We included a third secondary analysis, drawing from a study evaluating IPS as a strategy for reducing enrollment in the Norwegian disability system. Sveinsdottir et al. (2020) conducted an RCT of IPS for young adults receiving temporary benefits who were considered at high risk of permanent work disability. Control participants were assigned to attend a sheltered work program, as required in the Norwegian disability system. Participants qualified for benefits for a range of health-related, psychological, or other reasons (Sveinsdottir et al., 2018), including roughly half with mental health conditions. Sveinsdottir (2021) identified a subgroup of 23 IPS and 20 control participants who were classified as young adults reporting significant anxiety and/or depression, assessed by the Hopkins Symptom Checklist (Winokur et al., 1984).

Employment Outcomes

In 6 of the 7 studies, the employment rate at follow-up was at least 20% greater for IPS than for the control group, as

Table 2 Evaluations of IPS for transition-age young adults: employment and education rates

Primary Investigator	Baseline Employment and Education	Employment and Education Rates During Follow-up	Conclusions and Comments
<i>Randomized controlled trials—early psychosis studies</i>			
Killackey et al. (2008)	Employment: IPS: 5%; Ctl: 10% Education: Not reported	Employment: IPS: 65%; Ctl: 10% Education: IPS: 35%; Ctl: 24%	
Killackey et al. (2019)	Employment: IPS: 22%; Ctl: 11% Education: IPS: 16%; Ctl: 19%	6-month outcomes: Employment: IPS: 71%; Ctl: 48% Education: IPS: 58%; Ctl: 41%	IPS services for 6 months only. Outcomes n.s. at 12 and 18 months after baseline
Nuechterlein et al. (2020)	Employment: IPS: 24%; Ctl: 17% Education: IPS: 26%; Ctl: 9%	Outcomes for 12–18 months: Employment: IPS: 69%; Ctl: 33% Education: IPS: 67%; Ctl: 53%	Study included an initial stabilization prior to randomization
Erickson et al. (2021)	Employed at intake: IPS: 7%; Ctl: 14%	Employment: IPS: 72%; Ctl: 50%	
<i>Secondary analyses of randomized controlled trials—other young adult subgroups</i>			
Bond et al. (2016)	Unemployed at baseline	Employment: IPS: 82%; Ctl: 42%	
Christensen et al. (2019)	Unemployed and not in school at baseline and with a goal of work or education (usually not both)	Employment: IPS: 33%; Ctl: 20% Education: IPS: 44%; Ctl: 33%	In full sample (N = 720): employed or in school: IPS: 60% Control: 47%
Sveinsdottir et al. (2020)	Unemployed at baseline	Employment: IPS: 43%; Ctl: 5%	Registry-level employment data yet to be collected

CMHC community mental health center, Ctl control, FEP first episode of psychosis, IPS Individual Placement and Support, MH mental health, NEET not in employment, education, or training, ns not significant, RCT randomized controlled trial, SE supported employment, TAU treatment as usual

shown in Table 2. In all 7 studies, this difference was significant. Summing across the 7 studies, 208 (58.3%) of 357 IPS participants and 110 (32.4%) of 340 control participants were competitively employed during follow-up ($d = 0.53$). Meta-analysis showed an overall risk ratio of 1.69 (95% CI 1.43, 1.99), $z = 6.24$, $p < 0.001$, as shown in Fig. 2. The sample of studies was homogeneous. The two smallest studies also had the largest risk ratios.

All four first episode of psychosis studies enrolled some participants who were employed at baseline, as shown in Table 2. We repeated the meta-analysis adjusting for

baseline employment. The employment rate at follow-up was adjusted downward for both groups: 176 (54.2%) of 325 IPS participants and 89 (27.9%) of 319 control participants gained employment during follow-up ($d = 0.54$). The meta-analysis had similar results as the unadjusted results with an overall risk ratio of 1.79 (95% CI 1.48, 2.17), $z = 6.05$, $p < 0.001$. (See offline supplement).

As shown in Table 3, each RCT also reported at least one measure of job duration, assessed in the total follow-up samples. Three studies reported weeks worked, one reported days worked, and three reported hours worked. Not only are

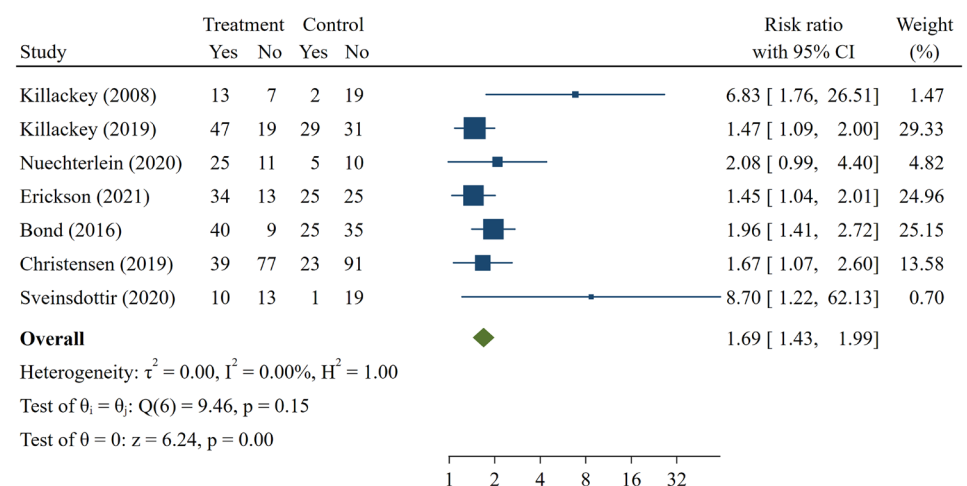
Fig. 2 Forest plot of relative risk of competitive employment during follow-up in 7 RCTs of IPS for young adults

Table 3 Duration of employment in 7 RCTs of IPS for young adults

Primary investigator	Length of follow-up	Duration measure	IPS M (SD)	Ctl M (SD)	Test of significance
Killackey et al. (2008)	6 months	Weeks worked	8.63 (9.22)	3.80 (10.07)	Mann–Whitney, $z = 2.52$, $p = 0.02$
Killackey et al. (2019)	6 months	Hours worked	IPS (~250 h) < Ctl (~255 h) (Graphical data)		n.s
Nuechterlein et al. (2020)	Last 12 months of 18-month follow-up	Weeks worked	19.4 (25.4)	11.7 (25.6)	$t = 2.07$, $p < 0.04$
Erickson et al. (2021)	Last 6 months of 12-month follow-up	Days worked	36.1 (40.7)	27.1 (42.9)	$t = 2.20$, $p < 0.05$
Bond et al. (2016)	18 months	Weeks worked	25.0 (26.9)	7.0 (14.1)	$t = 5.36$, $p < 0.001$
Christensen et al. (2019)	18 months	Hours worked	148.2 (396.0)	97.8 (317.7)	Rank sum test, $p < 0.02$
Sveinsdottir et al. (2020)	12 months	Hours worked	108.3 (186.0)	15.0 (67.1)	$t = 2.20$, $p < 0.05$

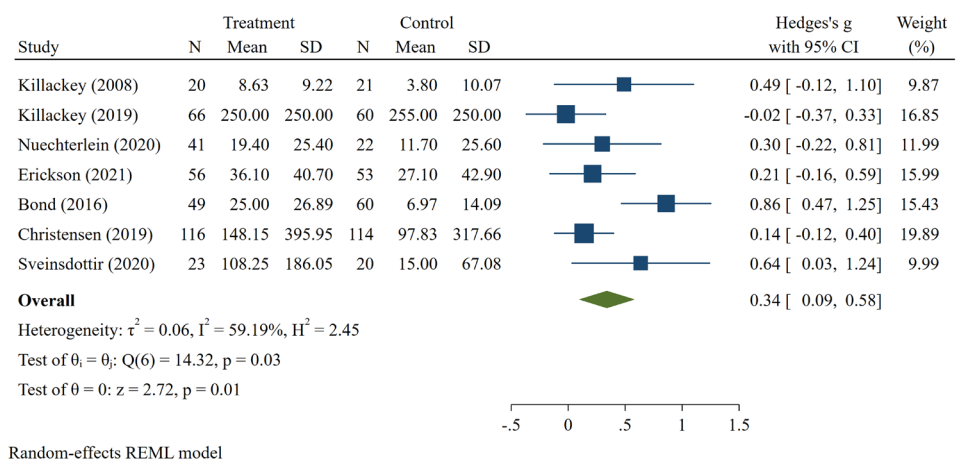
Analyses conducted on the total follow-up samples, including young adults who did not work during follow-up

these measures non-equivalent but also the follow-up periods differed. Six of the seven studies reported significantly greater job duration for IPS than controls. Killackey et al. (2019) reported graphical data only for hours worked, but the mean hours for the IPS and control groups were nearly the same, so we imputed zero difference between the two groups. As shown in Fig. 3, meta-analysis found a significant overall effect size (Hedge's g) of 0.34 (95% CI 0.09, 0.58), $z = 2.72$, $p < 0.01$.

Employment Outcomes for Young Adults Compared to Older Adults

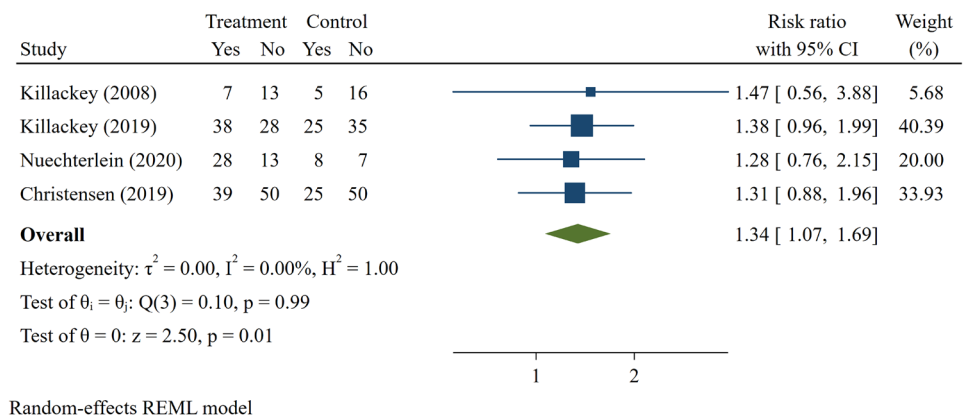
Two studies included in the review were secondary analyses of studies of standard IPS for adults of all ages, permitting comparisons between outcomes for young and older adults. The Bond et al. (2016) study examined a young adult subgroup drawn from a dataset consisting of 671 working-age

adults (mean age = 39.5) compiled for a meta-analysis of 4 RCTs of IPS (Campbell et al., 2011). The competitive employment rates during follow-up in the young adult sample (less than 30 years of age) (82% for IPS vs. 42% for controls) were higher than the corresponding rates in the older adult sample (68% for IPS vs. 21% for controls). Christensen et al. (2019) enrolled 720 adults of whom 230 were young adults (aged 18–30). The competitive employment rates during follow-up in the young adult sample (34% for IPS vs. 20% for controls) were lower than the corresponding rates in the older adult sample (42% for IPS vs. 35% for controls). However, the young adult sample had higher education rates (44% for IPS vs. 33% for controls) than the older population (21% for IPS vs. 14% for controls).

Fig. 3 Forest plot of job duration during follow-up in 7 RCTs of IPS for young adults

Note: The values for mean hours work for Killackey et al. (2019) are estimated from a graph. The standard deviations are imputed.

Fig. 4 Forest plot of relative risk of education during follow-up in 4 RCTs of IPS for young adults



Education Outcomes

Four RCTs reported education rates at follow-up, as shown in Table 2. The education rate at follow-up did not differ between the IPS and control groups in any of the 4 studies. However, combining the four studies, IPS did have a significantly higher education rate at follow-up than the control group. The overall risk ratio was 1.34 (95% CI 1.07, 1.69), $z = 2.50$, $p < 0.01$, as shown in Fig. 4. Summing across the 4 studies, 112 (51.9%) of 216 IPS participants and 63 (36.8%) of 171 control participants were in an education program during follow-up ($d = 0.31$).

We completed a parallel set of analyses adjusting for education at baseline in three first episode psychosis studies. The education rate was adjusted downward for both groups: 89 (46.1%) of 193 IPS participants and 47 (30.3%) of 155 control participants gained education during follow-up ($d = 0.33$). The meta-analysis showed an overall risk ratio of 1.40 (95% CI 1.07, 1.83), $z = 2.44$, $p < 0.01$. (See offline supplement).

Two studies had significant education results at 6 months but not for a later time period. Nuechterlein et al. (2020) found that the education rate for IPS was twice that for the control group at 6 months (68% versus 32%), a significant difference, but the difference narrowed over the ensuing 12 months. At 6 months, Killackey et al. (2019) reported a higher education rate for IPS compared to the control group after controlling for baseline education. Between 12 and 18 months the control group had a higher education rate than IPS (results reported graphically only).

Combined Employment and Education Rate

Three studies used the combined employment/education rate measure as a primary or secondary outcome (Christensen et al., 2019; Killackey et al., 2008; Nuechterlein et al., 2020). We re-analyzed the employment data, substituting the combined rate for these three studies. Summing across

the 7 studies, 239 (72.4%) of 330 IPS participants and 131 (43.5%) of 301 control participants were competitively employed and/or in education during follow-up ($d = 0.59$). The meta-analysis had similar results as the employment rate with an overall risk ratio of 1.58 (95% CI 1.37, 1.83), $z = 6.22$, $p < 0.001$. (See offline supplement).

Discussion

This systematic review and meta-analysis found that IPS services are effective in helping young adults with serious mental illness or early psychosis attain competitive employment. The impact of IPS on employment was robust and consistent across all seven studies included in the analyses. On average, 58% of young adults enrolled in IPS obtained employment during follow-up, 25% more than in services as usual. IPS participants also had significantly longer duration of employment compared to control participants.

Although controlled research on IPS for young adults with less severe mental health conditions is limited, the available evidence suggests that IPS generalizes to this subgroup as well (Hellström et al., 2022; Holmås et al., 2021; Sveinsdottir et al., 2020). More research is needed for this target group before drawing strong conclusions.

This review joins a growing body of systematic reviews and meta-analyses showing that IPS helps a wide range of target groups to improve their employment outcomes. However, the overall effect sizes in the current studies of young adults are small to moderate (Cohen, 1988), somewhat smaller than in studies of IPS for the broader population of adults with mental health conditions. Two IPS meta-analyses of RCTs for the broader adult population (i.e., working-age adults) reported overall risk ratios of 2.07 (Brinchmann et al., 2020) and 2.40 (Modini et al., 2016), compared to 1.69 in the current study. In addition, the overall effect size for duration of employment was small ($g = 0.34$), compared to meta-analyses of the general IPS literature (d effect sizes

of 0.55 for job tenure and 0.46 for job length) (Frederick & VanderWeele, 2019).

Despite lower effect sizes, the absolute rates of competitive employment for young adults in IPS closely resemble rates among older adults in IPS. The parsimonious interpretation is that young people with mental health conditions want to work and can work competitively, just like older adults, using the IPS approach. Young adults may stay in one job for less time than older adults because they are new to the workforce, trying out jobs, changing jobs, and taking time out for education—trends that are normative for young adults in the general population.

Although supported education is a component of the IPS service model, and IPS programs for young adults prioritize education outcomes (Swanson et al., 2017), our review found only four RCTs of IPS reporting education outcomes, none of which showed strong evidence that IPS increased enrollment in education programs compared to usual services. Combining the results of the four studies, IPS had a small but significant advantage over the control group in the education rate during follow-up. These modest findings on education are in accord with an earlier review of supported employment services in first episode psychosis programs (Bond et al., 2016).

The education findings are thus far inadequate to draw conclusions for several reasons. First, most studies do not clarify how many participants had educational goals. For example, if only 20% of participants in a study have educational goals, the study will typically be underpowered for any meaningful analysis of education outcomes. Second, educational goals may fluctuate more than employment goals. The Nuechterlein et al. (2020) study documented the changing aspirations for young adults and found significant gains in education but not employment during the first 6 months, followed by significant gains in employment during the remainder of the follow-up period. Killackey et al. (2019) found a temporal pattern favoring IPS for education outcomes in the first 6 months, but by 18 months the control group exceeded the IPS group in percentage enrolled in education. Third, a standardized, validated measure of educational outcome does not yet exist. Any involvement in competitive employment serves as a valid measure of employment because it correlates strongly with other measures of employment, such as job tenure, hours worked, and earnings (Bond et al., 2012). But any enrollment in an educational course may be less predictive of meaningful outcomes. Community college studies show that many young adults sign up for an educational course without completing the course or attaining any educational certification (Costa, 2014). Fourth, the IPS programs included in this review may not have fully implemented supported education despite achieving high fidelity to IPS. Only recently have IPS experts begun to

explicate the supported education component of IPS (Bond et al., 2019b). Perhaps IPS specialists require further training and technical assistance to implement supported education services.

The empirical literature on IPS for young adults is in its infancy. The current review focuses specifically on the IPS model and programs with clear fidelity standards. However, given the strong support for IPS as an evidence-based practice and the widespread interest in IPS for the young adult population, the number of published RCTs is surprisingly small.

Study Limitations

The RCTs included in this review did not adhere to any standardized employment outcome measurement battery (Bond et al., 2012), limiting the number of outcomes on which we could synthesize findings. None examined long-term follow-up (i.e., beyond 18 months). In addition, some RCTs enrolled a percentage of participants who were employed at baseline, unlike in the general IPS literature in which current employment typically is an exclusion criterion. To address this confounding factor, we reanalyzed the data adjusting the follow-up employment rate by baseline employment and found that these results resembled the uncorrected findings.

The measurement issues for education outcomes are much more problematic than for employment outcomes. As described above, sample selection, program delivery, and outcome measurement are major concerns. To account for both education and employment goals, some researchers measure employment and education with a single combined measure (e.g., percentage of participants employed and/or in education during follow-up), assuming without any evidence the equivalence of employment and education outcomes.

While IPS has been offered to a range of target groups within the young adult population, most published studies have evaluated IPS for young adults with early psychosis or serious mental illness. Our literature search found a wide range of target populations in over a dozen nonexperimental studies of IPS for young adults. Thus, we know that IPS has been widely offered to other young adult populations, but we know relatively little about its effectiveness for these other groups. An important question for future research is whether the findings for the early psychosis population generalize more broadly to other populations of young adults with mental health conditions.

In addition, the study samples varied widely in age ranges, probably reflecting the lack of consensus for defining the age cohort for the transition age young adult population. Within the age range from 16 to 30 are dramatic differences in developmental stage. The literature has not examined the

variation in response to IPS services or to outcomes within this age group.

Conclusions

IPS is effective in helping young adults with serious mental illness or early psychosis gain and keep competitive jobs. The impact of IPS on employment outcomes is similar for young adults as for older adults. The impact of IPS on education outcomes is much less clear. Future research should evaluate the generalizability of these findings to the broad range of young adults needing help with their employment goals. Researchers must also solve several problems to conduct methodologically valid studies of supported education.

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Declarations

Conflict of interest The authors declare that they have no conflicts of interest.

Ethical approval This study was a literature review that did not include human subjects and therefore did not require review by an institutional review board.

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