



# Effects of integrated supported employment plus cognitive remediation training for people with schizophrenia and schizoaffective disorders



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## ABSTRACT

**Objectives:** The present study aims to investigate the synergistic effects of cognitive remediation training (CRT) on Integrated Supported Employment (ISE). ISE blends individual placement support service with work-related social skills training for Chinese people suffering from schizophrenia or schizoaffective disorder.

**Method:** Ninety participants with schizophrenia or schizoaffective disorders were recruited from two psychiatric outpatient services in Hong Kong. They were randomly assigned into the ISE + CRT ( $n = 45$ ) and ISE ( $n = 45$ ) conditions. Blinded assessments on vocational, clinical, psychological, and neurocognitive outcomes were conducted by independent assessors. The two groups were followed up at 7 and 11 months.

**Results:** Both groups yielded similar improvements across several outcome domains assessed immediately after the interventions and at 7 and 11 month follow-ups, but no significant group differences were found. Significant positive trends over time in vocational, clinical and cognitive outcomes consistently favored the ISE + CRT condition.

**Conclusion:** While both the ISE + CRT and ISE groups demonstrated improvement in vocational, clinical, psychological, and neurocognitive outcomes, there was no evidence to show that cognitive remediation facilitated further improvement in these domains beyond gains associated with ISE alone. Further investigation is needed to fully exploit the synergistic potential of ISE combined with CRT, and to better understand which individuals experience a maximal benefit from the specific rehabilitation program components.

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## 1. Introduction

Individuals with severe mental illness (SMI) have an array of complex clinical and life problems. Problems in securing and maintaining employment have been of primary concern for researchers and practitioners alike because they undermine quality of life, reduce social networks, maintain poverty, limit insurance benefits, decrease recovery options, and reduce emotional, behavioral, and social well-being (Tsang et al., 2007). Helping people with SMI to obtain and sustain competitive employment is integral to improving their quality of life and facilitating their recovery (Strong, 1998; Tsang, 2003).

Individual Placement and Support Service (IPS) has consistently demonstrated competitive employment outcomes superior to that of other vocational services for individuals with SMI. A review reported that the competitive employment rate of those receiving IPS was in

the range of 47%–62%, as compared to about 25% for those who receive conventional and other types of vocational assistance (Bond et al., 2012). A more recent review showed employment rates between 58% and 60% for those receiving IPS, compared with 23%–24% for control conditions (Marshall et al., 2014). Recent replications in Switzerland using IPS yielded similar results with employment rates over 60% during a 5-year follow up period (Hoffmann et al., 2014). Our earlier studies on the Integrated Supported Employment model (ISE), which combines IPS and work-related social skills training (WSST), demonstrated a slightly higher competitive employment rate of 78.8% at the fifteenth month follow-up with job tenure averaging 24 weeks (Tsang et al., 2009). Other studies of IPS have yielded similar job tenure averages of between 17 and 30 weeks over 18-month to 2-year follow-ups (Bond et al., 2007; Bond and Kukla, 2011; Bond et al., 2012). A longer follow-up study showed an average job tenure of 32 months over 10-year follow-ups (Salyers et al., 2004). Although the employment rate using either IPS or ISE is impressive, the average job tenure is still far from satisfactory when compared with US and non-US general working populations, which averages 7–9 years (Sun et al., 2012; Bidwell, 2013). Our earlier job termination studies (Mak et al., 2006) found

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that interpersonal problems were commonly associated with short job tenure. This observation prompted our development of the combined approach of IPS and WSST and the creation of our augmented model of IPS that we called Integrated Supported Employment (ISE). ISE targets social competence and problem solving by using social skills training method ISE to boost vocational outcomes (Tsang, 2008).

The landmark review by Green (1996) investigated the contribution that deficits in neurocognition make to poor community functioning (social and vocational) among those with schizophrenia. Our later review echoed the conclusion that cognitive ability is a significant predictor of employment outcomes, including work success, skill acquisition, and independent living among those with SMI (Tsang et al., 2010). Along the same line, another review which focuses on the interaction between supported employment services (SE) and cognitive functioning has pinpointed that provision of SE alone may improve some basic cognitive domains such as attention and psychomotor speed, but that it is more difficult to address impairments in higher order functions including working memory, verbal learning and memory, and executive function (McGurk and Mueser, 2004). Several later randomized controlled studies further demonstrated that SE in combination with cognitive remediation training (CRT) significantly maximized the positive employment outcomes of SE alone by 12 to 24 months (McGurk et al., 2005; Bell et al., 2008).

In the present study, we take a step further by exploring whether improving neurocognitive functions by CRT can boost vocational outcomes beyond what integrated social skill training can do in our ISE program. We hypothesize that CRT may improve vocational outcomes, because improved cognitive capacity may allow participants in ISE to better utilize the social skills training and other rehabilitation interventions, as well as to perform better at work. This combination of interventions has not been explored in the literature and has never been attempted in an Asian country. We built upon our earlier work to develop a state-of-the-art model of supported employment which combines IPS, WSST and CRT. We hypothesize that vocational, clinical, psychological and neurocognitive outcomes would be further improved with this innovative approach.

## 2. Material and method

### 2.1. Participants

Ninety eligible participants from two local psychiatric out-patient clinics or day hospitals were recruited between April 2011 and April 2013. Participants were ages 18 and older with a DSM-IV-TR diagnosis of schizophrenia or schizoaffective disorder as confirmed by the Chinese Version Structural Clinical Interview for the Diagnostic and Statistical Manual of Mental Disorders IV (So et al., 2005). Participants were in various stages of rehabilitation at the time of recruitment, but were excluded if they had moderate or greater cognitive impairment. These excluded participants that had a score of greater than 18 on the 30-item Mini-Mental State Examination (Chiu et al., 1994) and/or were not mentally capable of giving informed consent. Participants were currently unemployed, and had competitive employment as their current vocational goal.

### 2.2. Measures

The primary outcome measures were employment rate and job tenure as measured by the employment outcome checklist (Tsang et al., 2002). Secondary measures included the 18-item Brief Psychiatric Rating Scale (BPRS) (Overall and Gorham, 1962); the Global Assessment of Functioning (GAF) (American Psychiatric Association, 2000); the Chinese version of Personal Well Being Index—Adult (PWI) (Lau et al., 2005), and the Rosenberg Self-esteem Scale (RSES). Executive functioning was measured by the Wisconsin Card Sorting Test (WCST) (Heaton et al., 1981). Five cognitive domains were measured by MATRICS

Consensus Cognitive Battery (MCCB) (Green et al., 2004), which included speed of processing, attention/vigilance, visual learning and memory, reasoning and problem solving, and social cognition. Verbal learning and working memory were measured in three stages of information processing by the Hong Kong List Learning Test (HKLLT) 2nd Edition (Chan et al., 2000; Chan, 2006).

### 2.3. Procedures

After giving informed consent, participants were randomly assigned to either the ISE + CRT group ( $n = 45$ ) or the ISE group ( $n = 45$ ) by a blinded research assistant based on random assignment generated by SPSS. The ISE component followed the protocol described in our previous studies (Tsang, 2003). Six out of seven core features of the IPS were incorporated with the exception of the rapid job search. Instead, ten WSST sessions (1.5–2 h per week) were conducted in group format prior to job search. Individualized ongoing support was given on an unlimited time basis within the study period after participants obtained employment. Participants in the ISE + CRT program received, in addition to ISE, 6 h (2-hour session, 3 sessions) per week of individualized, visual-based computer-assisted cognitive exercises by two cognitive remediation software systems [Strong arm system (StrongArm, 2007), a 2-hour session once per week; and Captain's Log (Sandford and Browne, 1988), 2-hour session twice per week]. A TV watching session was added on top of the ISE group as a control to neutralize the effect of additional time and therapist contact due to CRT in the ISE + CRT group. Both groups underwent 12 weeks (i.e., 3 months) of training sessions prior to job search, so that an individual could have a maximum of 72 h of cognitive training. Assessments were conducted before and after the completion of the three-month augmentation service, and follow-ups were done at 7 and 11 months after that service, and were performed by independent, trained, and blind assessors.

#### 2.3.1. Analysis

Baseline comparisons were performed by t-test or Chi-square to detect between-group differences. The Mann–Whitney  $U$  tests or McNemar tests were used where appropriate. Given the balanced design, repeated measures ANOVAs with post-hoc analyses were used to determine if significant differences occurred at different points in times of the study. Wilcoxon tests or Friedman tests were used to assess within-group differences if parametric assumptions were not met. Competitive employment referred to jobs in the community, either full-time or part-time, that were open to any individuals (Mak et al., 2006). Success in competitive employment was defined as having continuously worked in a job for two or more months for at least 20 h per week. The employment rate we reported at different follow-up periods was the cumulative rate. Job tenure was defined as the longest duration of employment sustained during the study. All participants were included in analyses following the 'Intent-to-treat' principle, with the last observation carried forward to replace any missing data. Significant levels were set at  $p < 0.05$  for all analyses with Bonferroni adjustments made with the  $p$ -values where appropriate.

## 3. Results

Both the ISE + CRT and ISE participants on average attended over 70% of the 12-week training sessions with no significant between-group differences ( $\chi^2 = 0.56$ ,  $df = 1$ ,  $p = 0.405$ ). The program attrition rate was 11.11% with 8.9% for the ISE + CRT group and 13.3% for the ISE group ( $\chi^2 = 0.45$ ,  $df = 1$ ,  $p = 0.502$ ). No group differences in demographic data and baseline clinical outcomes were found as seen in Table 1.

### 3.1. Vocational outcomes

Among ninety participants, 44.4% of ISE + CRT participants and 55.6% of ISE participants successfully obtained competitive employment

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