



Group cognitive behaviour therapy for supported employment – Results of a randomized controlled cohort trial

Tania Lecomte ^{a, c, *}, Marc Corbière ^{b, c}, Charles-Edouard Giguère ^c, Debra Titone ^d, Paul Lysaker ^e

^a University of Montreal, Department of Psychology, Bur. C-358, 90 avenue Vincent d'Indy, Pavillon Marie-Victorin, succ Centre-Ville, CP6128, Montréal, QC, H2C 3J7, Canada

^b Université du Québec à Montréal, Département d'éducation et Pédagogie – Counseling de carrière, Pavillon Paul-Gérin-Lajoie, Local N-6720, C.P. 8888, Succursale Centre-Ville, Montréal, QC, H3C 3P8, Canada

^c Centre de recherche de l'Institut Universitaire en Santé mentale de Montréal, 7331 rue Hochelaga, Montreal, QC, H1N 3V2, Canada

^d Department of Psychology, McGill University, 2001 McGill College Ave., Montreal, QC, H3A 1B1, Canada

^e Department of Psychiatry, Richard L. Roudebush VA Medical Center, Indiana University School of Medicine, 1481 West 10th Street, Indianapolis, IN, 46202, USA

ARTICLE INFO

Article history:

Received 12 February 2019

Received in revised form

27 September 2019

Accepted 31 October 2019

Available online xxx

Keywords:

Cognitive-behavior therapy

Supported employment

Work

Randomized controlled trial

Severe mental illness

ABSTRACT

The merging of evidence-based interventions with supported employment programs are being increasingly studied, with encouraging results. The current study is aimed at determining the impact of a brief cognitive behaviour therapy group intervention adapted for supported employment programs (called CBT-SE) on the work outcomes of: obtaining a competitive job, number of weeks worked, and number of hours worked per week. Participants were randomized to either receive the 8-session CBT-SE group on top of their supported employment program, or to only receive their support employment program. The results show that those who received CBT-SE were significantly more likely to obtain a job (75% vs 58%), and worked a significantly greater number of hours (24 vs 18 hours per week). No differences were found in terms of number of weeks worked. Those in the CBT-SE condition also experienced a significant decrease in their negative symptoms over time, compared to the control condition. Although replication is needed, these results suggest that a brief cognitive-behavioural intervention specifically tailored to work-related issues can be greatly beneficial.

© 2019 Elsevier B.V. All rights reserved.

1. Introduction

1.1. Supported employment programs

Supported employment (SE) programs are considered evidence-based practices in helping individuals with severe mental illness obtain work (Bond, 2004); (Campbell et al., 2011). SE programs help people with severe mental illness obtain real-world competitive employment, with regular wages, based on their clients' preferences (Drake et al., 2012). Employment specialists working in SE programs aim at quickly finding regular paid work for their clients, and offer them unlimited support according to their needs at work. Recent meta-analyses revealed that SE fared much better than

other programs in terms of helping people obtain employment, with risk ratios of 2.4 (Modini et al., 2016) comparing SE to traditional vocational services in general, and risk ratios of 2.2 and 2.7, respectively, when comparing SE to prevocational training and to transitional employment (Suijkerbuijk et al., 2017)– suggesting more than twice the employment rate for those receiving SE. A review of 20 randomized controlled trials by Drake and Bond (2014) revealed that employment rates in SE programs are higher than those of other programs, and vary from 20% to 80% depending on the site and the country, with a median of 60% (Drake and Bond, 2014).

Even though SE programs are recognized as evidence-based practices compared to other vocational services, many who enroll in SE fail to obtain a job (close to 50% obtain a regular job), and among those who do, many fail to sustain employment (Corbière and Lecomte, 2009). Job tenure for people who benefit from supported employment services is in fact brief, often less than five months (McGurk et al., 2005). Furthermore, many participants in SE

* Corresponding author.

E-mail addresses: tania.lecomte@umontreal.ca (T. Lecomte), corbiere.marc@uqam.ca (M. Corbière), cedouard-giguere.iusmm@ssss.gouv.qc.ca (C.-E. Giguère), debra.titone@mcgill.ca (D. Titone), plysaker@iupui.edu (P. Lysaker).

programs do not work enough hours in order to obtain financial autonomy from welfare. In fact, in Quebec (Canada) a worker with a mental disorder needs to work more than 20 hours per week, at minimum wage, in order to financially gain more than welfare (Latimer, 2001, 2008).

These results have stimulated efforts to address work-related difficulties in order to improve the effectiveness of supported employment for individuals with severe mental illness by proposing augmented SE programs (Lecomte et al., 2014b). Augmented supported employment or SE + has been defined as a combination of supported employment program with a recognized intervention (often evidence-based interventions or programs), such as social skills training, assertive community treatment, cognitive remediation, or cognitive behavioural therapy (Suijkerbuijk et al., 2017). Recently, a Cochrane review concluded that, overall, augmented SE programs show great promise in terms of higher job acquisition ($RR = 1.40$; 95% CI 0.92 to 2.14) and higher job tenure rates ($MD = 10.09$; CI: 0.32–19.85) compared to SE programs alone (Suijkerbuijk et al., 2017). These conclusions were however based on moderate-to low-quality evidence (Suijkerbuijk et al., 2017) and a small number of studies.

1.2. Augmented SE programs

The first augmented SE intervention, *Workplace Fundamentals* (Wallace and Tauber, 2004; Kopelowicz et al., 2006), aimed at improving work-related social skills, with the idea that better problem solving and social skills could improve job tenure. However, the published studies present contradictory results. For example, Mueser et al. (2005) as well as Glynn et al. (2017) failed to find significant advantages in adding skills training to SE programs in terms of work outcomes, whereas Tsang et al. (2010) reported better vocational outcomes with a 25% higher rate of employment and longer job tenure for those having received skills training. More recently, Nuechterlein and colleagues (Nuechterlein et al., 2019) found important improvements in work outcomes in individuals with early psychosis who received the skills training program, but the comparison condition did not receive SE so the actual contribution of the social skills training was not possible to assess. McGurk and colleagues' (McGurk et al., 2005, 2009) developed a cognitive enhancement program for SE programs (*Thinking Skills for Work*), based on the assumption that cognitive deficits might explain some of the difficulties in job retention for people with severe mental illness (McGurk and Mueser, 2006) (McGurk et al., 2015). Those receiving the augmented SE program obtained increased scores over time on several neurocognitive measures as well as improved job acquisition (by 24%), and doubled the number of weeks worked over the course of 12–18 months (7 vs 3 weeks) (McGurk et al., 2015). Au and colleagues (Au et al., 2015), using a similar cognitive enhancement program did not find any significant advantages for the augmented SE program on any of the cognitive, clinical or work outcomes. A recent meta-analysis specifically on cognitive remediation for SE (Sauvé et al., 2019) concluded that cognitive remediation-enhanced SE programs do not significantly improve job tenure. Although not yet studied for supported employment, a cognitive behavior therapy (CBT)-augmented SE program could yield work-relevant benefits.

1.3. Relevance of CBT-SE

Lysaker and colleagues demonstrated that group CBT targeting work-related beliefs, the Indianapolis Vocational Intervention Program (IVIP) (Lysaker et al., 2005); (Lysaker et al., 2009), could improve vocational outcomes in Veterans with severe mental illness receiving traditional vocational services. Given the efficacy of SE programs, we wished to adapt IVIP to be delivered in SE

context. As such, CBT-SE (Lecomte et al., 2014a) was developed and became the first group CBT for individuals receiving SE. CBT-SE covers essential work-related beliefs. Indeed, individuals with severe mental illness entering or re-entering the workplace often have dysfunctional beliefs regarding their own efficacy or work abilities, or regarding the workplace. Various studies have demonstrated that specific irrational beliefs or cognitive biases can be found in individuals with severe mental illness, either pertaining to the self or to others, and affecting how they analyze information. For instance, individuals with severe mental illness can have poor or fluctuating self-esteem (Thewissen et al., 2008) which makes them vulnerable to internalizing social stigma against people with severe mental illness. This may result in deeply held beliefs that one is incapable of keeping a job or even too unstable or fragile to work (i.e. defeatist beliefs, Lysaker et al., 2005). Another cognitive bias found in individuals with paranoia is the tendency to see other people as threatening, the cause of negative events, or as needing to be avoided (Moutoussis et al., 2007). Such thinking can easily lead to various difficulties in the workplace, and even quitting one's job. Other cognitive biases potentially linked to work dysfunction include jumping to conclusions or reasoning biases (Moritz and Woodward, 2005) – thinking patterns that can lead to a quick and unwarranted belief that the workplace is a negative and dangerous place. In contrast, others who see work as a mean to a desired social status and occupation, but who do not foresee obstacles, may become quickly discouraged when a problem occurs. A new job entails new stressors and many adaptations or coping strategies. Individuals with severe mental illness often have developed specific skills to cope with their daily stressors or symptoms (e.g. listening to music to diminish auditory hallucinations (Ventura et al., 2004)), but those coping strategies are not always adequate or do not suffice for the stressors found in the workplace. CBT helps people recognize their thinking patterns, verify their accuracy and seek alternative beliefs before acting on them, as well as develop new coping strategies to manage stressors and symptoms. CBT-SE keeps the essential IVIP components while being brief and adapted to SE programs.

1.4. Objective

The purpose of this study is to determine the efficacy of a group cognitive behavioural intervention for supported employment, CBT-SE, in improving work-related outcomes for people with severe mental illness enrolled in SE programs. We anticipated that the participants in CBT-SE condition would have superior work outcomes in terms of: 1) higher competitive employment rates; 2) greater job tenure (more weeks worked); and 3) greater work intensity (more hours worked per week) at one month, six months and one year follow-up compared to the participants in the control condition only receiving SE.

2. Method

2.1. Design

This is a time-limited randomized-controlled cohort trial with measures administered at baseline, upon their entry into the SE program (T0), as well one month later (T1) or post-therapy for those receiving CBT-SE, six-month follow-up (T2) and a 12-month phone follow-up (T3). For the T3, only work outcomes were assessed, whereas for the other timepoints, all the work and clinical measures were administered. The study took place in Montreal and included five agencies offering SE, namely: Arrimage Montreal, IPS-Douglas, L'Avancée, Accès-Cible, and JAP (CHUM). Ethical approval from Université de Montréal, Université de Sherbrooke, Centre Hospitalier de l'Université de Montréal

(CHUM), l'Institut Universitaire en Santé Mentale de Montréal, and Douglas Hospital were obtained. Every aspect regarding confidentiality and participants' legal rights were respected. Participants were compensated for their time spent on assessments but not for participating in the CBT-SE intervention.

2.2. Participants

A total of 164 participants were recruited from the participating SE agencies. Participants were allocated to the intervention or control group by cohort, that is, we alternatively recruited for CBT-SE or the control condition according to their week of entry into the study. As such, they were not stratified on any variable. Separate consent forms were used so participants would not feel left out if they were not recruited for the CBT-SE group. Research assistants performing testing and interviews were blind to treatment condition. **Inclusion criteria were:** having a severe mental illness (schizophrenia, bipolar, or major depression), being followed by a participating supported employment agency, capacity to consent to the study, currently not working and seeking work, or working less than 5 hours a week and wishing for another job with more hours. **Exclusion criteria were:** inability to communicate in French or English, having a known organic disorder or IQ below 70 (documented), and having previously received CBT. Substance abuse, social and/or cognitive deficits were not exclusion criteria. Demographic information is presented in Table 1.

Given our interest in determining if the CBT-SE intervention offered any advantages to existing SE programs, we decided that participants had to have attended at least 4 out of the 8 group CBT-SE sessions (N = 79) to be considered in the CBT-SE condition for the analyses. We considered that 4 sessions were a minimum

exposure to CBT and to the group. 85 participants were assigned to the control condition because they either received SE only or attended less than 4 sessions of CBT-SE (N = 17). Of those in the control condition, 57 were randomized to the control condition, 11 never showed up to the group, 14 attended one session and 3 attended two sessions.

2.3. CBT-SE intervention

Participants in the CBT-SE group could receive a maximum of eight 1-hour group sessions, twice per week for one month. The one-month timespan was chosen to maximize the chances of completing the group prior to starting a job, given the rapid-job search principle of SE programs. Participants each had their own manual that contained information on all eight sessions (see Table 2), as well as homework they completed outside of the sessions. Two co-therapists led each session that included an average of five participants per group. For the purpose of this study, the therapists were trained by our team and hired for the study. Therapists training took place over the course of two days by one of the investigators and co-developers of the manual (TL). Each therapy session was audio-recorded for supervision and quality assurance purposes. Table 2 describes the content and title of each session. Compared to the IVIP (Lysaker et al., 2005), CBT-SE is much shorter, works on job acquisition earlier on, and focuses more on negotiating accommodations and coping with stigma at work. Typically, each session involves review of the homework (if applicable), presentation of the theme of the session, presentation of some didactic information, discussions and application to self of the material, writing relevant information to retain into one's manual, review of the session and presentation of the homework. The last

Table 1
Sociodemographic, diagnostic and clinical (BPRS) information for participants overall and by condition.

	SE (N = 85)	CBT-SE (N = 79)	Total (N = 164)
Age	37.0 (11.6)	36.1 (11.0)	36.6 (11.3)
Male	50 (59.5%)	49 (62.0%)	99 (60.7%)
Female	34 (40.5%)	30 (38.0%)	64 (39.3%)
Single	62 (72.9%)	67 (84.8%)	129 (79.1%)
Less than 11th grade	23 (28.0%)	21 (27.3%)	44 (27.7%)
11th grade degree (high school)	27 (32.9%)	20 (26.0%)	47 (29.6%)
College degree (grades 12–13)	22 (26.8%)	15 (19.5%)	37 (23.3%)
University degree	10 (12.2%)	21 (27.3%)	31 (19.5%)
Phys. Dis	11 (13.4%)	13 (17.3%)	24 (15.3%)
No Phys. Dis	71 (86.6%)	62 (82.7%)	133 (84.7%)
No work < 6 months	33 (39.8%)	25 (31.6%)	58 (35.8%)
No work 7–12 months	11 (13.3%)	13 (16.5%)	24 (14.8%)
No work 1–5 years	12 (14.5%)	16 (20.3%)	28 (17.3%)
No work > 5 years	27 (32.5%)	25 (31.6%)	52 (32.1%)
Dx Mood disorder	13 (15.7%)	17 (21.5%)	30 (18.5%)
Dx Anxiety disorder	8 (9.6%)	4 (5.1%)	12 (7.4%)
Dx Organic disorder	1 (1.2%)	0 (0.0%)	1 (0.6%)
Dx Psychotic disorder	49 (59.0%)	46 (58.2%)	95 (58.6%)
Dx Substance-related	0 (0.0%)	2 (2.5%)	2 (1.2%)
Dx Personality disorder	6 (7.2%)	4 (5.1%)	10 (6.2%)
Dx Developmental disorder	1 (1.2%)	2 (2.5%)	3 (1.9%)
Dx Other	5 (6.0%)	4 (5.1%)	9 (5.6%)
BPRS T0 total	41.94 (9.19)	40.16 (10.17)	41.07 (9.70)
positive	10.60 (4.69)	9.36 (4.47)	9.99 (4.62)
negative	10.51 (2.89)	10.64 (3.86)	10.57 (3.39)
BPRS T1 total	40.86 (9.50)	38.74 (10.15)	39.64 (9.90)
positive	9.63 (4.83)	9.32 (4.77)	9.45 (4.78)
negative	11.21 (4.13)	9.86 (2.59)*	10.43 (3.39)
BPRS T2 total	41.55 (9.66)	41.81 (12.48)	41.71 (11.39)
positive	9.31 (4.0)	10.11 (6.13)	9.81 (5.40)
negative	9.38 (3.11)	8.50 (3.97)	8.84 (3.22)

Table 2
CBT-SE content.

Session number	title	content
1	Coping with stress at work	<ul style="list-style-type: none"> - recognizing stress, its effects on body, thoughts, emotions - recognizing stress in the various steps of work integration (interview, first day, etc.) - sharing strategies to cope with stress at work
2–3	Recognizing and modifying my dysfunctional beliefs linked to work	<ul style="list-style-type: none"> - learning the A-B-C's of CBT - understanding the impact of negative or dysfunctional beliefs on our emotions and behaviours - getting facts and finding alternative beliefs
4	Overcoming obstacles linked to reintegrating the workplace	<ul style="list-style-type: none"> - recognizing personal obstacles to obtaining or maintaining a job - sharing and practicing strategies to overcoming these obstacles
5	My strengths and competencies related to work	<ul style="list-style-type: none"> - understanding the power of negative self-attributions - recognizing one's strengths and abilities with the help of others in the group
6	Accepting criticism and asserting myself appropriately	<ul style="list-style-type: none"> - using techniques learned so far when confronted with criticism (coping with stress, A-B-C, check facts, not jump to conclusions, recognize strengths) - learn relaxation and acceptance - role-play polite self-assertion - negotiating work accommodation with employer
7–8	My best coping strategies for work	<ul style="list-style-type: none"> - discussing disclosure of mental illness and stigma at work - reviewing coping strategies that work best for each person for personal stressors, symptoms, moods and thoughts at work - review of the manual, what was learned, liked, etc.

session ends with a small graduation celebration, involving a certificate for each person's participation and a group meal.

2.4. Measures

The following work outcomes were measured over the course of one year: *Competitive employment* was defined as a dichotomous variable (yes/no) – only regular jobs in the workplace paying minimum wage or more were considered as a 'yes'. Other jobs (e.g., transitional, protected) or volunteering were rated as 'no'. For *job tenure* the number of weeks worked over the course of the study (12 months) was used. We did not distinguish if these weeks pertained to the same job or not, given that supported employment programs value the right fit between the person and the job and encourage changing jobs if needed. *Work intensity* was measured by the number of hours worked per week.

Sociodemographic information was collected at baseline (T0) with the Canadian Version of the PSR Toolkit (Arns, 1998). Diagnoses were also verified at baseline with the computerized SCID by trained psychology graduates. In order to ensure equivalence between conditions, psychiatric symptoms were collected at baseline (T0), one month (T1) and six month follow-ups (T2) with the Brief Psychiatric Rating Scale-Expanded Version (BPRS-E (Ventura et al., 1993)). This 24-item semi-structured interview was also conducted by trained-to-gold-standard psychology graduates. Research assistants and interviewers were blind to treatment condition.

3. Analyses

Analyses were conducted with the statistical program R, version 3.5.0, along with the *lmer* library. Descriptive and mean-group differences were conducted at baseline. Analyses across time were based on the following linear mixed model with a random intercept:

$$\gamma_{ijk} = \beta_{0i} + \beta_{1j} + \beta_{2k} + \beta_{(12)jk} + \epsilon_{ijk}$$

$$\beta_{0i} = \beta_0 + \epsilon_i$$

where γ is one of our outcomes (for ex. number of hours worked) for participant i (N), who was part of the condition j (1: SE, 2: CBT-

SE), at time k (times 1, 2, 3). ϵ_{ijk} and ϵ_i are residuals from the principal model and the constant whereas β_{1j} , β_{2k} and $\beta_{(12)jk}$ respectively represent the coefficients of the model associated with the group, the time, and the interaction group by time. When the model did not vary across time, a classic ANOVA was used, and for dichotomic data, a chi-square test was calculated.

4. Results

4.1. Descriptives

As can be seen in Table 1, participants were on average 36.6 years of age (SD: 11.3), more likely to be male (60.4%), single (79%), and Caucasian (63.4%). There were no significant baseline differences between the two conditions on any of the sociodemographic, diagnostic variables or clinical variables. Overall, the sample included mostly people with primary diagnoses of psychotic and mood disorders.

4.2. Obtaining competitive work

Regarding the first outcome of obtaining competitive work, chi-square analysis with Yates continuity correction confirmed a significant difference over the course of the study between the two conditions ($X^2 = 3.92$, $p < 0.05$), with 75% for those in the CBT-SE condition obtaining competitive work compared to 58% in the SE condition (see Table 3 and Fig. 1). The odds ratio revealed that those in the CBT-SE condition were 2.2 times more likely to obtain competitive work than those only receiving SE (95% CI: 1.0–4.8). Most participants obtained only one job but 9 (14%) in the SE condition and 22 (29%) in the CBT-SE condition obtained two jobs during the study, whereas 4 (6%) in SE and 5 (7%) in CBT-SE obtained three jobs. The difference between conditions was not significant ($p = 0.06$).

Table 3

Participants having obtained at least one competitive job during the study, by condition.

	SE	CBT-SE	Total
No competitive work	27 (42.2%)	19 (25.0%)	46 (32.9%)
Competitive work	37 (57.8%)	57 (75.0%)	94 (67.1%)
Total	64 (45.7%)	76 (54.3%)	140 (100.0%)

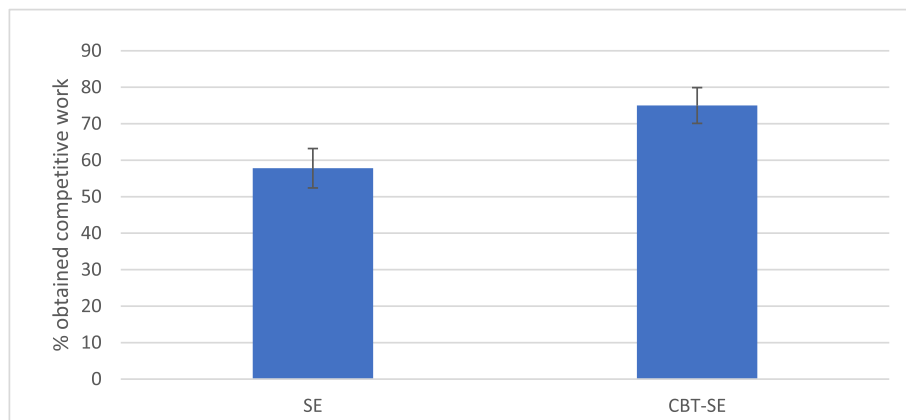


Fig. 1. Percentage of participants having obtained at least one competitive job during the study.

4.3. Number of weeks worked

For the second outcome, number of weeks worked, there were no significant difference between the two conditions. As can be seen in Fig. 2 and Table 4 for those who obtained a competitive employment, the number of weeks worked during the course of the study improved over time but was similar across conditions.

4.4. Number of hours worked per week

As for work intensity, i.e. the number of hours worked per week, our analysis revealed that on average, those who had received CBT-SE worked 5.5 hours per week more than those in the SE alone condition (see Table 4 and Fig. 3). Indeed, the SE only condition worked on average 18.21 hours per week (SD: 2.17), whereas those in the CBT-SE condition worked on average 23.75 hours per week (SD:1.46); this difference was statistically significant ($X^2 = 3.91$; $p = 0.048$).

4.5. Changes in symptoms

As a post-hoc analysis, we verified if changes in symptoms occurred over time as measured by the BPRS-E. As can be observed in Table 1, both groups remained fairly stable over time regarding their overall symptoms and their positive symptoms of psychosis.

We did however see a group by time interaction regarding negative symptoms, with those in the CBT-SE group seeing larger improvements in negative symptoms over time than those in the SE condition ($F(2, 238.5) = 4.35$, $p = 0.013$). The difference between both conditions was greatest at T1 (i.e. one month or post-intervention; $\text{diff} = -1.51$; $p = 0.027$).

5. Discussion

5.1. Competitive work

The purpose of this study was to determine if a novel augmented SE intervention, CBT-SE, could improve the work outcomes of those who received it compared to those only receiving SE. As such, we were interested in investigating the effects of the intervention on obtaining work, on job tenure, as well as on work intensity. Our first result showed that those who took part in the group were 2.2 times more likely to obtain work, with an extra 17% of the participants in that condition obtaining a competitive job. This result corroborates with the recent Cochrane review (Suijkerbuijk et al., 2017), suggesting that those receiving augmented SE interventions were more likely to obtain work. A recent pilot study on CBT for work in people with severe mental illness receiving supported employment reported a 50% employment rate (Kukla et al., 2018). Most studies in SE in Canada and the

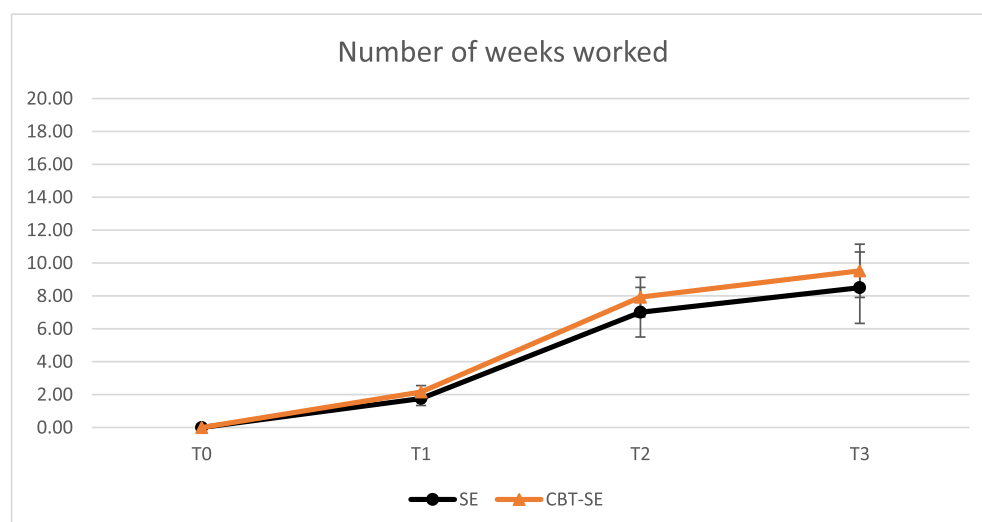
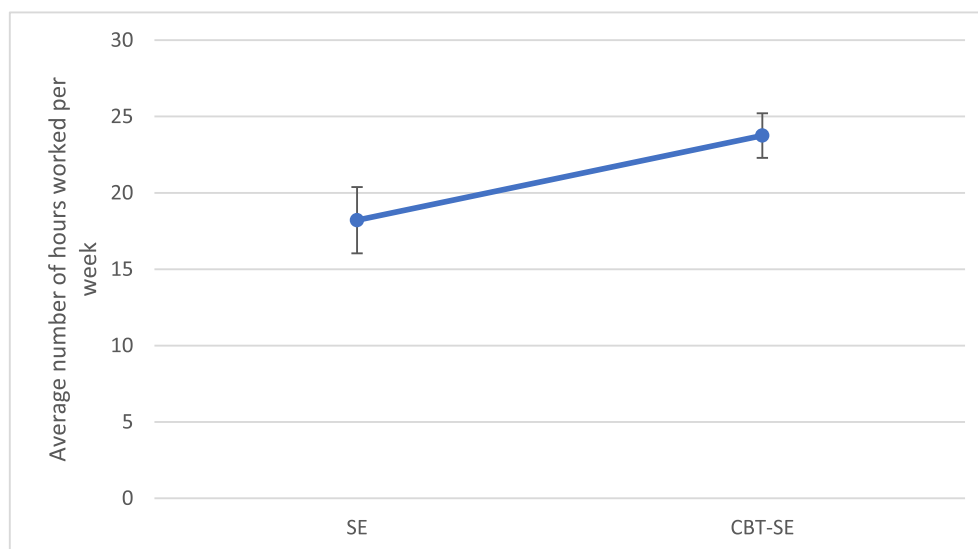


Fig. 2. Number of weeks worked T0: baseline, T1: one month (or post-CBT), T2: 7 months, T3: 13 months.

Table 4
Coefficients table for work outcomes.

Outcome	Estimate	Standard error	F	df	p value
Number of weeks worked	Intercept: 7.9390 CBT-SE: 0.5972	1.486 1.876	0.101	108	0.751
Number of hours worked per week	Intercept: 18.208 CBT-SE: 5.542	2.171 2.616	4.487	75	0.0375*

**Fig. 3.** Hours worked per week per condition.

USA also report job acquisition rates around 50%. For those in the SE condition alone, we also found a similar result (even a bit higher, 58%), whereas over 75% of those in the CBT-SE condition obtained work. Such an increase in clients obtaining work is quite significant for a SE program. At this stage, the mechanisms explaining this result are not clear. It is possible that the content of the CBT-SE intervention, focusing in part on overcoming obstacles (including obstacles to obtaining work) and recognizing their strengths as workers, could have helped participants in their interviews, improved their self-confidence and also helped them be better prepared for their job search. In fact, a thorough evaluation of perceived obstacles was done in the group, enabling participants to specifically work on their personal obstacles to obtaining a job, through role-plays, and CBT techniques (see (Corbière et al., 2004)).

5.2. Job tenure

The second outcome, job tenure, was defined here as the number of weeks worked during the course of the study. We did not focus specifically on consecutive weeks because SE programs aim at quickly finding work with the idea that if it does not work out for different reasons, the person can switch to another job just as quickly. This is based on the fact that while people can imagine enjoying their work in a certain setting (e.g. in a bakery), the actual experience of the job can make the person realize it is not for them (e.g., it is too hard to get up before dawn). Changing jobs, or not maintaining one's job could be a positive move when the job is a poor match and clearly unsatisfying, but it could also be a sign that the person is not able to cope with criticism or problem-solve at work. Given we did not detail the reasons for changing jobs, we chose to document the number of weeks the person was working, although not necessarily at the same job. As such, it is not possible

to say if those who received the intervention were better or not at dealing with problems at work and tried to find alternative ways of dealing with situations rather than quitting, compared to those in the SE condition. Overall, participants who obtained a job, in both conditions, worked the same number of weeks over the course of the study (13 months) and no significant difference regarding the number of jobs obtained was detected. This lack of difference was also found in other short-term follow-up studies investigating SE vs augmented SE studies, whereas longer follow-ups (e.g. over two years) are typically associated with better job tenure for those having received the augmented SE intervention (Suijkerbuijk et al., 2017).

5.3. Work intensity

As for our third work outcome, work intensity or the number of hours worked per week, our results appear to surpass those found in other SE and augmented SE studies. The Cochrane review (Suijkerbuijk et al., 2017) found a maximum of 17 hours worked per week for augmented SE programs, whereas those in the CBT-SE condition worked on average 24 hours per week (compared to 18 for those in the SE condition). As mentioned by researchers in SE, a person on welfare needs to work more than 20 hours at minimum wage in order to see a financial benefit sufficient to forgo welfare (Bond et al., 2008). The extra 6 hours worked per week can make the difference between staying or not on welfare. For many individuals registered in SE programs, the goal is not only to work but also to have a structured lifestyle, to feel valued by others, and to contribute to society by making enough money to live independently, without having to strongly rely on the public system (through welfare for instance (Steihaug et al., 2014)). Recent results from a study on work integration of people with severe mental

illness demonstrates that those who work more, also use fewer health and social services (Sultan-Taïeb et al., 2019). It is possible that the CBT-SE intervention, given it offered tools to negotiate accommodations at work, to cope with stress, and better analyze work situations, made working more hours easier. More studies replicating these results are needed.

5.4. Negative symptoms

Although it was not a specific target, the fact that participants in the CBT-SE condition improved to a greater extent over time in terms of their negative symptoms than those in the SE condition was not overly surprising. Many studies and a recent meta-analysis (Turner et al., 2014) have found that group interventions, particularly interventions that are active, with role-plays, lead to improvements in negative symptoms. The fact that participants need to travel more to get to the group, that they interact with others and have homework to do – all things that ‘get them moving’ have a direct impact on their negative symptoms.

5.5. Limits

Our results have some limitations. We did not compare the efficacy of specific group therapists, nor did we consider the moment of recruitment within the study (cohort effect). We did not randomize participants individually, with stratifications, but rather by cohort. We did not run intent-to-treat analyses since we chose to investigate the therapeutic effects of the intervention and have therefore only included those with sufficient exposure to the treatment. Our results do not inform us regarding who benefits most from the CBT-SE intervention, nor did it control for factors such as neuro- or socio-cognitive deficits. It is also possible that candidates who refused to take part in the study were in some way different from those who agreed to take part. Furthermore, we do not have the actual numbers regarding the individuals who agreed to participate vs those who were aware of the study but did not.

6. Conclusion

The findings reported here suggest that a brief cognitive-behavior intervention, specifically adapted to supported employment programs, can bring important benefits in terms of significantly increasing job acquisition and improving financial autonomy (via more hours worked per week) compared to supported employment programs alone. A better understanding of factors related to job tenure is warranted. Future studies should replicate this study and also investigate mechanisms of action, and profiles of high and low treatment responders.

Contributors

Authors T.L. and M.C. managed the literature review and planned the analyses, that were conducted by C-E.G. Author T.L. wrote the manuscript, whereas authors M.C., D. T., C-E.G. and P.L. offered their comments and approval.

Funding

The study was funded by the Canadian Institutes of Health Research (investigators: T.L., M.C. D.T. and P.L.), grant number: RN155187.

Declaration of competing interest

None of the authors declare a conflict of interest.

Acknowledgements

We would like to thank the supported employment programs and their clients who took part in this study.

References

- Arns, P., 1998. Canadian Version of the PSR Toolkit. Ontario Federation of Community Mental Health and Addiction Programs.
- Au, D.W., Tsang, H.W., So, W.W., Bell, M.D., Cheung, V., Yiu, M.G., Tam, K.L., Lee, G.T., 2015. Effects of integrated supported employment plus cognitive remediation training for people with schizophrenia and schizoaffective disorders. *Schizophr. Res.* 166, 297–303.
- Bond, G.R., 2004. Supported employment: evidence for an evidence-based practice. *Psychiatr. Rehabil. J.* 27 (4), 345–359.
- Bond, G.R., Drake, R.E., Becker, D.R., 2008. An update on randomized controlled trials of evidence-based supported employment. *Psychiatr. Rehabil. J.* 31, 280–290.
- Campbell, K., Bond, G., Drake, R.E., 2011. Who benefits from supported employment: a meta-analytic study. *Schizophr. Bull.* 37 (2), 370–380.
- Corbière, M., Lecomte, T., 2009. Vocational services offered to people with severe mental illness. *J. Ment. Health* 18, 38–50.
- Corbière, M., Lesage, A., Mercier, C., 2004. Perceptions of barriers to employment, coping efficacy, and career search efficacy in people with mental illness. *J. Career Assess.* 12 (4), 460–478.
- Drake, R.E., Bond, G., 2014. Introduction to the special issue on individual placement and support. *Psychiatr. Rehabil. J.* 37 (2), 76–78.
- Drake, R.E., Bond, G.R., Becker, D.R., 2012. *Individual Placement and Support: an Evidence-Based Approach to Supported Employment*. Oxford University Press, New York.
- 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. Serv.* 68 (3), 271–277.
- Kopelowicz, A., Liberman, R.P., Zarate, R., 2006. Recent advances in social skills training for schizophrenia. *Psychiatr. Bull.* 32, s12–s23.
- Kukla, M., Bell, M.D., Lysaker, P.H., 2018. A randomized controlled trial examining a cognitive behavioral therapy intervention enhanced with cognitive remediation to improve work and neurocognition outcomes among persons with schizophrenia spectrum disorders. *Schizophr. Res.* 197, 400–406.
- Latimer, E.A., 2001. Economic impacts of supported employment for persons with severe mental illness. *Can. J. Psychiatr.* 46 (6), 496–505.
- Latimer, E., 2008. Le soutien à l'emploi de type « placement et soutien individuels » pour les personnes atteintes de troubles mentaux graves : sa pertinence pour le Québec. Agence d'évaluation des technologies et modes d'intervention en santé (Quebec).
- Lecomte, T., Corbière, M., Lysaker, P.H., 2014a. Une intervention de groupe cognitive comportementale pour les personnes suivies par un programme de soutien en emploi (TCC-SE). *L'Encéphale* 40 (Suppl. 2), S81–S90.
- Lecomte, T., Corbière, M., Simard, S., Leclerc, C., 2014b. Merging evidence-based psychosocial interventions in schizophrenia. *Behav. Sci.* 4 (4), 437–447.
- Lysaker, P.H., Bond, G.R., Davis, L., Bryson, G.J., Bell, M.D., 2005. Enhanced cognitive-behavioral therapy for vocational rehabilitation in schizophrenia: effects on hope and work. *J. Rehabil. Res. Dev.* 42 (5), 673–682.
- Lysaker, P.H., Davis, L.W., Bryson, G.J., Bell, M.D., 2009. Effects of cognitive behavioral therapy on work outcomes in vocational rehabilitation for participants with schizophrenia spectrum disorders. *Schizophr. Res.* 107, 186–191.
- McGurk, S.R., Mueser, K.T., 2006. Strategies for coping with cognitive impairments of clients in supported employment. *Psychiatr. Serv.* 57, 1421–1429.
- McGurk, S., 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. *Schizophr. Bull.* 31, 898–909.
- 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. *Schizophr. Bull.* 35, 319–335.
- McGurk, S.R., Mueser, K.T., Xie, H., Welsh, J., Kaiser, S., Drake, R.E., Becker, D.R., Bailey, E., Fraser, G., Wolfe, R., McHugo, G.J., 2015. Cognitive enhancement treatment for people with mental illness who do not respond to supported employment: a randomized controlled trial. *Am. J. Psychiatry* 172, 852–861.
- Modini, M., Tan, L., Brinchmann, B., Wang, M.-J., Killackey, E., Glozier, N., Mykletun, A., Harvey, S.B., 2016. Supported employment for people with severe mental illness: systematic review and meta-analysis of the international evidence. *Br. J. Psychiatry* 209, 14–22.
- Moritz, S., Woodward, T.S., 2005. Jumping to conclusions in delusional and non-delusional schizophrenic patients. *Br. J. Clin. Psychol.* 44 (2), 193–207.
- Moutoussis, M., Williams, J., Dayan, P., Bental, R.P., 2007. Persecutory delusions and the conditioned avoidance paradigm: towards an integration of the psychology and biology of paranoia. *Cogn. Neuropsychiatry* 12 (6), 495–510.
- Mueser, K.T., Aalto, S., Becker, D.R., Ogden, J.S., Wolfe, R., Schiavo, D., Wallace, C.J., Xie, H., 2005. The effectiveness of skills training for improving outcomes in supported employment. *Psychiatr. Serv.* 56 (10), 1254–1260.
- Nuechterlein, K.H., Subotnik, K.L., Ventura, J., Turner, L.R., Gitlin, M.J., Gretchen-Doorly, D., Becker, D.R., Drake, R.E., Wallace, C.J., Liberman, R.P., 2019. Enhancing return to work or school after a first episode of schizophrenia: the UCLA RCT of

- Individual Placement and Support and Workplace Fundamentals Module training. *Psychol. Med.* 4, 1–9.
- Psychiatric Rating Scale. *Int. J. Methods Psychiatr. Res.* 3, 221–244.
- Sauvé, G., Lepage, M., Corbière, M., 2019. Impacts de la combinaison de programmes de soutien à l'emploi et de remédiation cognitive sur le maintien en emploi de personnes souffrant de schizophrénie: une méta-analyse (Impact of vocational programs integrating cognitive remediation on job tenure in schizophrenia: a meta-analysis). *Ann. Med.-Psychol.* 177, 534–543 (in press).
- Steihaug, S., Werner, A., Lossius, T., 2014. Work and activity in rehabilitation of persons with co-occurring severe mental health difficulties and substance use problems. *Health* 5 (06), 78.
- Suijkerbuijk, Y.B., Schaafsma, F.G., van Mechelen, J.C., Ojajärvi, A., Corbière, M., Anema, J.R., 2017. Interventions for obtaining and maintaining employment in adults with severe mental illness, a network meta-analysis. *Cochrane Systematic Rev.* 9.
- Sultan-Taïeb, H., Villotti, P., Berbiche, D., Dewa, C., Desjardins, É., Fraccaroli, F., Zaniboni, S., Mazaniello, M., Durand, M.-J., Lecomte, T., Durand, M.-J., Corbière, M., 2019. Can social firms contribute to alleviate the economic burden of severe mental illness for the public healthcare system? *Health Soc. Care Community* 1–10.
- Thewissen, V., Bentall, R.P., Lecomte, T., van Os, J., Myin-Germeys, I., 2008. Fluctuations in self-esteem and paranoia in the context of daily life. *J. Abnorm. Psychol.* 117, 143–153.
- Tsang, H.W.H., 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. *Aust. N. Z. J. Psychiatr.* 44 (1), 49–58.
- Turner, D.T., van der Gaag, M., Karyotaki, E., Cuijpers, P., 2014. Psychological interventions for psychosis: a meta-analysis of comparative outcome studies. *Am. J. Psychiatry* 171 (5), 523–538.
- Ventura, J., Green, M.F., Shaner, A., Liberman, R.P., 1993. Training and quality assurance with the brief psychiatric rating Scale. *Int. J. Methods Psychiatr. Res.* 3, 221–244.
- Ventura, J., Nuechterlein, K.H., Subotnik, K.L., Green, M.F., Gitlin, M.J., 2004. Self-efficacy and neurocognition may be related to coping responses in recent-onset schizophrenia. *Schizophr. Res.* 69, 343–353.
- Wallace, C.J., Tauber, R., 2004. Supplementing supported employment with workplace skills training. *Psychiatr. Serv.* 55 (5), 513–515.