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Vocational rehabilitation augmented with cognitive behavioral therapy or cognitive remediation for individuals with schizophrenia: a 5-year follow-up study

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ABSTRACT

Introduction: Although employment is an important part of recovery for individuals with schizophrenia spectrum disorders, the employment rate for this group remains low. Increasing evidence supports the use of augmented vocational rehabilitation (VR) programs to improve occupational outcome. The aim of this study is to explore 5-year follow-up registry data from the JUMP study, a VR program for individuals with schizophrenia spectrum disorders, specifically with regard to competitive employment outcome and predictors of competitive employment. The VR was augmented with either cognitive remediation (CR) or elements from cognitive behavior therapy (CBT).

Methods: One hundred and forty eight participants with schizophrenia spectrum disorders from six Norwegian counties received 10 months VR augmented with either CR ($n = 64$) or CBT ($n = 84$). Both competitive and sheltered workplaces were used. Assessments were conducted at baseline, at post intervention and at 2-year follow-up. Data on employment status at 5-year follow-up was obtained by registry.

Results: At 5-year follow-up 55.4% were engaged in working activity, of which 22.3% had obtained competitive employment. A further 18.2% had work placements in competitive workplaces. Number of received intervention hours and competitive employment at 2-year follow-up emerged as significant predictors of competitive employment. IQ and intervention type in marginal favor of CBT were predictors on trend level.

Conclusion: To the best of our knowledge, this is the first study investigating competitive employment at 5-year follow-up for individuals with schizophrenia spectrum disorders. The results add to existing evidence that competitive employment is attainable for this group.

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Psychotic disorders; individual support; employment outcome; longitudinal study

1. Introduction

Employment is an important and defining role in life, also for people with severe mental illness such as schizophrenia spectrum disorders. In addition to being a source of income, employment structures life and is an important source of social contact as well as fostering positive self-image and personal identity [1]. Schizophrenia spectrum disorders are, however, frequently associated with unemployment and dropout of education. European estimates of employment rates for this group range from 10% to 20% [2], with data from Norway indicating up to 90% unemployment [3,4]. Furthermore, schizophrenia and schizoaffective disorders constitute the fifth leading cause of disability worldwide [5]. Nevertheless, work is a frequently stated outcome goal for this group [6,7].

Barriers to employment include illness-related factors such as positive and negative psychotic symptoms and neurocognitive impairment all causing functional disability [8–11]. There are also several external or social barriers to unemployment, including the Norwegian welfare system with high coverage and prolonged compensation, which may lead to a *benefit trap* [12], promoting dependence, and social exclusion among people with severe mental illness. Furthermore, unemployment contributes to the stigmatizing attitudes surrounding individuals with schizophrenia spectrum disorders, suggesting they are incapable of work [13]. This may defer individuals from seeking work due to self-stigmatization, creating a vicious cycle [14].

In line with the recovery perspective in mental health care, the focus has gradually expanded from mere symptom reduction and sheltering from the hardship of work, to

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include functional recovery in terms of participation in the labor market as both a treatment intervention and a treatment goal [15,16]. The transition from a traditional train-then-place model of vocational rehabilitation (VR) to supported employment programs such as individual placement and support (IPS) represents a shift in the services for people with psychiatric disabilities [17]. The effectiveness of IPS on employment outcomes has been confirmed in over twenty international trials [18]. However, numerous occupational challenges remain for this group, including work performance difficulties and unwanted job discontinuations. Thus, there has been increasing interest in improving the vocational programs by 'augmentation' to address illness-related barriers, as a way to optimize occupational outcome.

In this context, the job management program (JUMP) was developed with the aim of aiding individuals with schizophrenia spectrum disorders obtain and maintain employment. JUMP was aligned with many of the IPS principles, but differed from IPS in that work placements and sheltered employment were also used in the process toward regular employment. Furthermore, JUMP incorporated cognitive remediation (CR) or elements from cognitive behavior therapy (CBT) over six months as part of the VR [19]. The main objectives of the present study were to examine the long-term employment status of the JUMP participants 5 years after inclusion with particular emphasis on competitive employment. The secondary objective was to explore predictors of competitive employment.

2. Methods

2.1. Jump

The JUMP program consisted of VR services delivered over a 10 months period in six Norwegian counties. The VR started with an assessment of resources, experience, and preferences, followed by help in the job application process including preparing resumes, interview practice, and obtaining employment. This was followed by sustained support in maintaining work, i.e. skills training and task adaptation. In three randomly selected counties, VR was augmented with CR and in the remaining three with elements from CBT. An important focus was to ensure close collaboration between mental health services and VR services, both at a political level and site/local level. Both competitive and sheltered workplaces were used in the process toward regular employment based on individual needs and how VR-services in each county were organized. Participants were given the intervention randomized to their catchment area twice a week over a 6-month period. The CR and CBT interventions were carried out by trained employment specialists, who received weekly supervision by experienced mental health professionals throughout the project. The JUMP study was approved by the Regional Committee of Medical Research Ethics and The Norwegian Data Protection Authority (ClinicalTrials.gov identifier NCT01139502).

2.2. Interventions

All participants received VR consisting of sustained support and close collaboration between the participant and other involved parties, including the employment specialists, general practitioners, mental health professionals, employers, and social and vocational services. Psychoeducation (symptoms, course, treatment, prevention, rehabilitation, and prognosis) was also provided to project teams, participants, and in some cases employers and colleagues. The VR focused on rapid job placement in positions matched to participants' preferences with ongoing job support. Although the goal was competitive employment, work placements, and vocational training in sheltered workshops were also used. Participants were assessed at baseline, post intervention ~10 months after baseline and 2 years after randomization (follow-up). CBT and CR were discontinued at post treatment.

2.2.1. Cognitive remediation

The CR intervention was a computer-based program designed to improve the neurocognitive function in individuals with mental illness. The aim was to reduce cognitive dysfunction and improve occupational functioning. CR is particularly relevant for employment as it may improve domains such as attention, working memory, cognitive flexibility, and planning. The JUMP CR program has many similarities with the Thinking Skills for Work program [20,21]. Up to 40 h of CR were delivered to participants by employment specialists who had received training in the basic principles of CR, use of computer software, strategies to enhance motivation and performance, and transfer of knowledge and skills acquired through training to the work setting. The program is described in detail elsewhere [22].

2.2.2. CBT techniques

The CBT intervention in the JUMP study was geared at managing functional difficulties and counterproductive expectations related to situations at the workplace. Psychotic symptoms were not addressed per se. Employment specialists undertook basic training in CBT and delivered CBT sessions twice a week with the participants. The sessions were delivered both *in vivo* at the workplace, and at the employment specialists' office. The aim of using CBT techniques was to improve occupational performance by addressing negative expectations and cognitive biases related to work. Techniques used were cognitive restructuring, motivational interviewing, graded exposure, and homework. The program is described in detail elsewhere [19].

2.3. Participants

Participants were primarily referred from mental health and vocational services within their catchment area, but self-referral was also possible. All participants provided written informed consent. Exclusion criteria were head injury with loss of consciousness, neurological disorder, IQ below 70, medical condition interfering with brain function, and age

outside the range 18–65. Furthermore, individuals who displayed violent behavior, severe alcohol, and/or drug dependence and suicidal ideation as measured with a score of 3 or higher on the Health of the Nation Outcome Scales [23] were excluded. Understanding and speaking Norwegian to assure valid neurocognitive test performance was a requirement. A total of 148 participants who met the criteria for a broad schizophrenia spectrum disorder according to the Diagnostic and Statistical Manual of Mental Disorders, Fourth Edition [24] were included. Of these 84 and 64 were, respectively, allocated to the CBT and CR interventions. Of these, 137 participants completed the neurocognitive assessment at baseline. Six non-native speakers were excluded from analyses of neurocognition due to poor language abilities. One hundred and thirty-one participants were thus included in analyses involving neurocognitive variables.

2.4. Assessments

2.4.1. Clinical assessments

Clinical assessments were carried out by trained and calibrated clinicians. For diagnostic evaluation, the M.I.N.I. PLUS [25] was used. Structural Clinical Interview of the Positive and Negative Syndrome Scale (SCI-PANSS) [26] was used to evaluate the levels of psychotic symptoms. In addition, demographic data were recorded.

2.4.2. Neurocognitive assessment

Neurocognitive assessments were carried out by trained clinical psychologists. Two subtests form the Wechsler Abbreviated Scale of Intelligence [27] including Vocabulary and Matrix Reasoning were used at baseline to estimate current IQ. Assessment of neurocognition was performed with the nine subtests from the MATRICS Consensus Cognitive Battery (MCCB) (excluding the measure of social cognition) assessing six domains; Speed of processing, Attention/Vigilance, Working memory, Verbal learning, Visual learning, and Reasoning and problem solving [28]. Using the mean of the nine demographically corrected domain T-scores, a modified MCCB neurocognitive composite score was calculated.

2.4.3. Employment data

All employees in Norway are registered by their employer with the Norwegian Labor and Welfare Administration (NAV). Those who are self-employed are required to register their business with the Register of Business Enterprises. Data from these registers are controlled against the individuals' tax return to generate register-based statistics of employment with Statistics Norway. Employment data were continuously recorded by the employment specialists during the intervention period. At two-year follow-up, employment status was obtained through interview with the participant and confirmed through register-based employment statistics. At five-year follow-up, register-based employment statistics were obtained from Statistics Norway. Employment at five-year follow-up was defined as having worked at least one month during the last calendar year, which is in line with the way employment is defined by NAV.

2.5. Statistical analyses

IBM SPSS Statistics for Windows, Version 25.0 (2017) was used for all analyses. MCCB raw scores were converted to T-scores based on US norms [28]. All tests were two-tailed. Levels of significance were set at $p = .05$. Student's t-tests and Chi-square tests were conducted to examine group differences at baseline. A binary logistic regression analysis was applied to explore the associations between relevant predictors and employment status after 5 years. A multiple hierarchical regression analysis with number of months employed during year 5 after study inclusion as the criterion variable was also performed. Independent variables entered into both regression analyses were gender, age, duration of illness (DOI) at baseline, IQ, psychotic symptoms as measured with the SCI-PANSS scores (positive, negative, and general) at baseline, type of intervention (CR or CBT), and number of hours of intervention. Employment status at 2-year follow-up was also entered as a predictor in the analysis.

Due to the extensive use of work placement and sheltered work in Norwegian rehabilitation services, we also include results for this employment outcome. Finally, we report the number of job changes for the participants over the intervention period.

Exploratory analyses were performed to investigate whether there were group differences between those who obtained competitive employment at 5-year follow-up and those who did not regarding symptoms, function (as measured by the GAF-F/GAF-S), neurocognitive function and DOI. Repeated T-tests were performed for this purpose. Furthermore, we wanted to explore if there were differences between those who were competitively employed at both 2- and 5-year follow-up, compared to those who did not obtain competitive employment.

3. Results

3.1. Baseline analysis

The demographic, clinical, and neurocognitive characteristics of the JUMP participants are displayed in Table 1 below. There were no between-group differences at baseline on demographic, clinical, neurocognitive, or medication variables except for gender, DOI, and SCI-PANSS score for positive symptoms.

3.2. Occupational outcome

At 5-year follow-up 55.4% of the participants were in some form of employment. Thirty-three individuals (22.3%) were competitively employed at 5-year follow-up. Of these, 13 were competitively employed and 15 had work placement at 2-year follow-up. The results of occupational outcome are summarized in Figure 1.

Table 1. Demographic, clinical, and neurocognitive characteristics of the JUMP participants by treatment group.

Ntotal = 148	CBT (*n* = 84)	CR (*n* = 64)	Test statistics (df)[a]	Group comparison (p)
Diagnosis			X^2 (3, *n* = 148) = 1.45	ns
Schizophrenia	90.4% (*n* = 76)	85.9% (*n* = 55)		
Schizoaffective disorder	6.0% (*n* = 5)	9.4% (*n* = 6)		
Psychosis NOS	1.2% (*n* = 1)	3.1% (*n* = 2)		
Delusional disorder	2.4% (*n* = 2)	1.6% (*n* = 1)		
Age, mean (SD)	33.2 (8.0)	32.4 (7.9)	t(148)= 0.62	ns
Gender, male (%)	53 (63%)	50 (78%)	X^2 (1, *n* = 148) = 3.88	0.05
Education, highest completed			X^2 (5, *n* = 148) = 2.99	ns
Primary school	31.0%	32.8%		
High school	33.3%	34.4%		
Trade school	9.5%	14.1%		
College	15.5%	14.1%		
University	8.3%	4.7%		
Not completed primary school	2.4%	–		
IQ, mean (SD)	101.3 (14.2)	101.9 (13.5)	t(148) = −0.30	ns
Units of DDD main antipsychotic, mean (SD)[b]	1.1 (0.7)	1.1 (1.0)	t(140) = 0.13	ns
DOI, mean years (SD)	8.1 (6.8)	5.9 (5.5)	t(143) = 2,08/2,16	0.04
SCI-PANSS				
Positive, mean (SD)	12.5 (4.5)	14.0 (4.5)	t(142) = −2.00	0.05
Negative, mean (SD)	16.2 (5.7)	15.8 (5.6)	t(141) = 0.37	ns
General, mean (SD)	28.6 (8.6)	30.1 (7.6)	t(144) = −1.12	ns
GAF-F	51.0 (8.6)	49.7 (10.3)	t(148) = 0.83	ns
GAF-S	51.6 (9.6)	54.0 (11.2)	t(148) = −1.43	ns
Previously employed	89.3 % (*n* = 75)	82.8% (*n* = 53)	X^2 (1, *n* = 148) = 1,30	ns
Months part time, mean (SD)	18.1 (37.4)	15.1 (31.0)	t(146) = 0.52	ns
Months full time, mean (SD)	44.8 (63.0)	40.1 (63.0)	t(146) = 0.44	ns
Months work placement, mean (SD)	7.0 (18.3)	4.3 (10.5)	t(147) = 1.06	ns
MCCB Domain T-scores, mean (SD), *N* = 131	*N* = 68	*N* = 63		
Processing speed	36.6 (10.1)	35.1 (8.6)	t(126) = 0.89	ns
Attention	39.1 (10.6)	36.9 (9.2)	t(129) = 1.26	ns
Working memory	41.2 (9.7)	41.6 (9.5)	t(128) = −0.24	ns
Verbal learning	38.5 (7.9)	41.0 (10.7)	t(129) = −1.50	ns
Visual learning	36.3 (12.1)	38.0 (10.4)	t(129) = −0.80	ns
Problem solving	44.5 (10.0)	42.3 (9.2)	t(129) = 1.21	ns
Neurocognitive composite score	39.5 (6.4)	39.1 (6.6)	t(125) = 0.35	ns

[a]Degrees of freedom.
[b]Defined daily dosage.

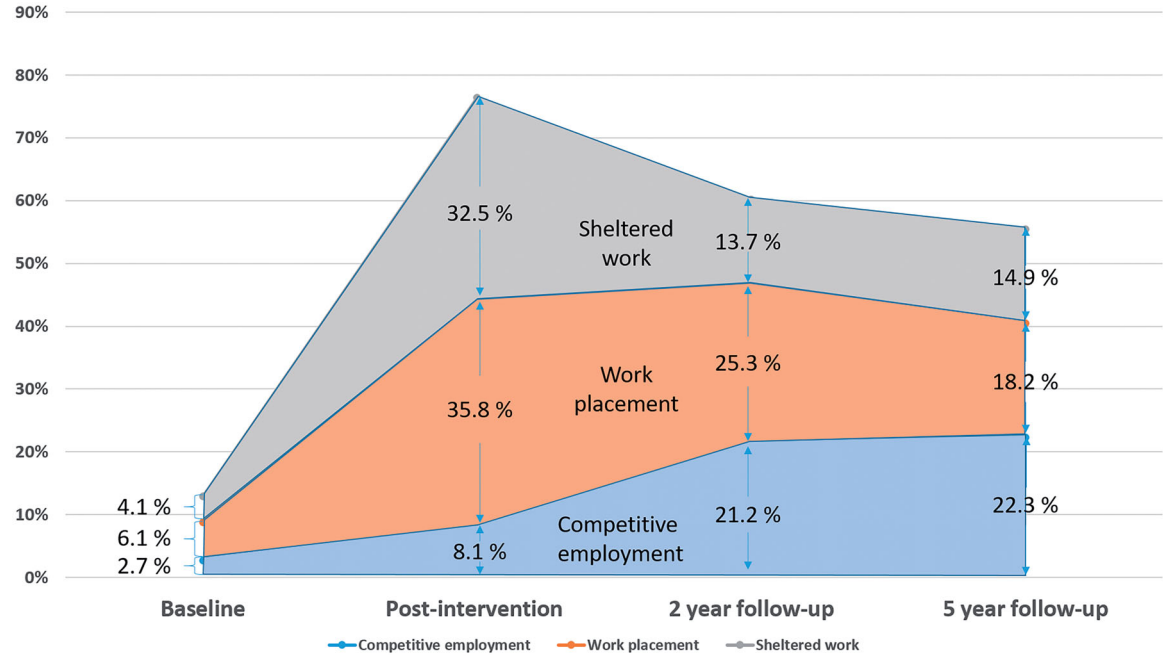

Figure 1. Occupational outcome of the JUMP participants for both intervention groups.

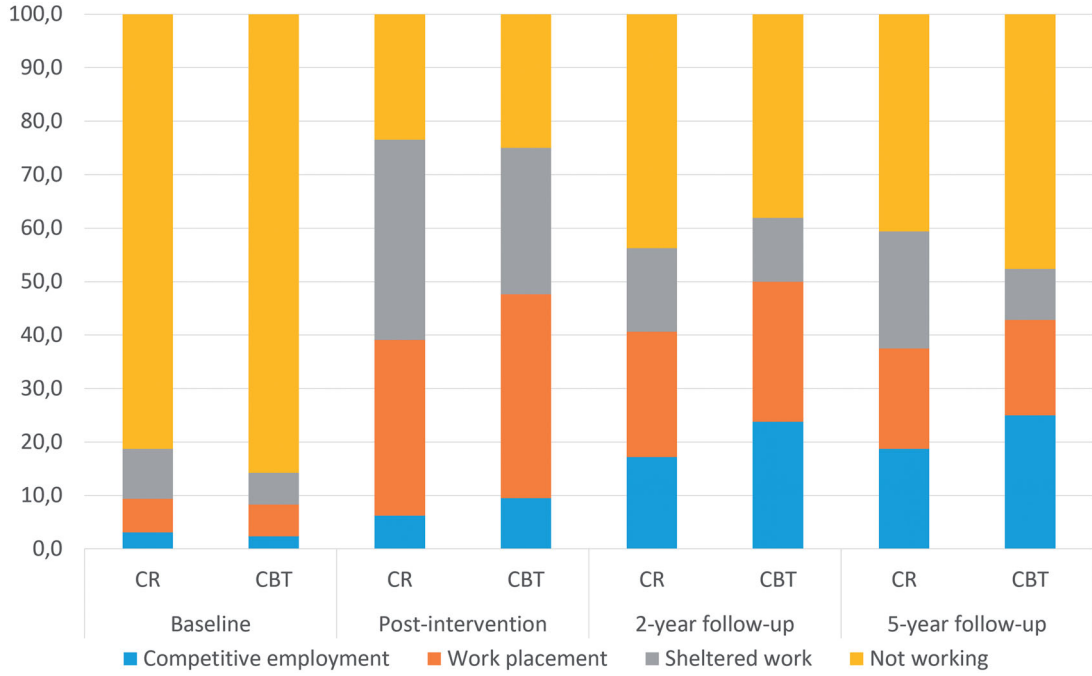

Figure 2. Occupational outcome for the JUMP participants, split by intervention type.

In the CR group, 59% were employed vs. 52% in the CBT group. In Figure 2, the occupational outcome for the JUMP participants is displayed by intervention type. No differences were observed in occupational outcome (Chi-square = 4.103, $p = .52$) between respectively CR and CBT for competitive employment (19% vs. 25%), work placement (18.8% vs. 17.9%), and sheltered employment (21.9% vs. 9.5%).

Of the 148 participants, 33 individuals changed jobs over the study period. These had on average 2.39 job changes (range 1–5). Data is missing for three individuals. Overall, the participants in the study had on average 0.54 job changes (range 0–5).

3.3. Predictors of occupational outcome

A binary logistic regression analysis was carried out with occupational status of competitive employment at 5-year follow-up as criterion. The model contained demographic variables (gender, age, IQ, and DOI), symptom levels at baseline, intervention type (CBT/CR), number of received intervention hours, and employment status at 2-year follow-up as covariates.

The final model was significant (X^2 (10, $n = 134$) = 26.1, $p = .04$) and explained between 17.7% (Cox and Snell R Square) and 27.6% (Nagelkerke R Square) of the variance. Number of received intervention hours ($p = .008$) and competitive employment at 2-year follow-up ($p = .003$) emerged as significant predictors. IQ ($p = .06$) emerged as a predictor on trend level.

A multiple hierarchical regression analysis with the same predictors, but with number of months worked in the fifth year after inclusion as the criterion variable was also conducted. The final model was significant (F10, 125 = 3.043, $p = .002$), and explained 19.6% of the variance. Significant predictors were number of received intervention hours (B = 0.254, $p = .003$) and employment at 2-year follow-up (B = −0.259, $p = .002$). Type of intervention was marginally significant in favor of CBT (B = −0.168, $p = .06$).

3.4. Exploratory analyses of group differences

Those competitively employed at 5-year follow-up displayed significantly higher IQ (107.06 vs. 99.97, $p = .009$) and GAF S (symptom) score (56.03 vs. 51.68, $p = .032$) compared to those who did not work competitively. There was also a trend for better global functioning (GAF F) (53.09 vs. 49.71, $p = .067$) among the participants working competitively. The 13 who were competitively employed at both 2- and 5-year follow-up showed significantly lower negative scores on SCI-PANSS at baseline (12.25 vs. 16.39, $p = .015$) and significantly higher neurocognitive composite score (43.08 vs. 39.53, $p = .053$). Overall, there was also a significant difference indicating that those competitively employed at 5-year follow-up worked more hours per week at the end of the intervention period (Mean difference 7.7 h (9.2 vs. 16.9 h); $p > .001$; SD −11.7, −3.7), and between the end of the intervention and 2-year follow-up (Mean difference 10.7 h (12.7 vs. 23.4 h); $p > .001$; SD −15.6, −5.7).

4. Discussion

The current study identified that ∼55% of the participants were in some form of employment five years after inclusion in the JUMP study. Twenty-two percent of the participants were competitively employed, which is slightly higher than at two-year follow-up. The findings add to existing evidence that individuals with schizophrenia spectrum disorders are able to both obtain and maintain competitive employment. We found that those who worked the most early in the intervention period were also more likely to be employed at five-

year follow-up. An important finding is that the amount of intervention provided was a key component for employment success. Participants who were working at 5-year follow up had, on average received more hours of intervention than those who were not working.

The effectiveness of IPS for individuals with psychosis has been demonstrated over a wide range of different labor markets and welfare systems in Europe [29]. Furthermore, studies have shown that participants prefer IPS over other forms of vocational services, both in terms of help seeking and maintaining employment, and satisfaction with the service delivered [30,31]. Despite this, significant amount of participants in IPS services do not attain their occupational goals [32]. The model provides opportunity and support, but illness-related factors are not specifically addressed, and tend to remain obstacles to employment. Negative experiences and low expectations may lead individuals with schizophrenia to view themselves as less competent and less likely to have vocational success. Negative beliefs are important predictors of poor work outcomes in schizophrenia [33]. Augmenting VR with cognitive interventions may consequently increase vocational functioning for this group and emphasizes the importance of not only placement, but support in the IPS model. JUMP aligned with several IPS principles and might thus constitute a type of enhanced IPS model, in which the interventions specifically address illness-related factors affecting work function, thus enabling participants to attain and maintain employment. Work-focused CBT directly targets beliefs and behaviors that may interfere with work functioning, including the aspect of social interaction and collaboration with co-workers, which may be particularly challenging whereas CR directly targets cognitive impairment. Cognitive impairment is characterized as one of the strongest illness-related factors associated with unemployment and poor vocational functioning among individuals with schizophrenia.

It is well established that schizophrenia is a complex neurodevelopmental disorder with cognitive impairment as a core feature [34,35]. One of the main findings of this study is that IQ is a predictor for competitive employment. This is in line with previous studies of schizophrenia having consistently found that cognitive function predicts social and clinical outcomes, including occupational function [36–38]. General cognitive ability, has been shown to be a more sensitive and reliable predictor of functional outcome than measures of specific ability [36]. In addition, a better global function in terms of higher GAF score for symptoms was a predictor of competitive employment. Although not surprising, this is an important finding in identifying who may benefit from VR in achieving competitive employment. This further underlines the importance of defining employment as an essential treatment goal, in particular when global functioning is high and for individuals experiencing their first psychotic episode. Although the importance of employment as a treatment goal has increased, some clinicians still hold negative attitudes toward competitive employment as a realistic goal for individuals with schizophrenia [39]. Findings from the current study indicate the importance of integrating VR at an early point in treatment, particularly if global functioning is relatively high, as this may help prevent functional decline.

When interpreting the results in the current study, it is important to note that the JUMP program was launched in 2009, a time in which IPS had not yet been implemented in Norway. Although SE was introduced in Norway from the early 1990s, the first randomized controlled trail of IPS was not initiated until 2012 [40]. VR services in Norway has traditionally followed a train-then-place approach, and the NAV has typically outsourced vocational services to agencies that provide sheltered work or other subsidized or unpaid work placement [40]. This, in combination with a generous welfare system creating economic incentives for young people with uncertain work capacity to apply for early disability benefits, has been a backdrop for the implementation of IPS in Norway. The results from the current study must be viewed in this context, which may explain the substantial proportion of participants employed in work placement and sheltered work, compared to competitive employment. The use of sheltered work did however decrease over time in this study (from 32.5% to 14.9%). This can be partly explained by the development of IPS services in Norway, particularly in the time between 2- and 5-year follow up. In addition, the welfare scheme in Norway does not routinely allow for sheltered work to continue time-unlimited, which result in that people in sheltered work after a while either change to competitive employment or stop working and will receive disability benefit.

Employment numbers in both interventions groups were overall high, and did not differ significantly between the CBT and CR groups, which is in accordance with previous findings for the JUMP study at 2-year follow-up regarding vocational outcomes [19,38]. There were slightly more participants working in general in the CR group, with more participants in the CR group to be in work placement, and sheltered employment. Regarding competitive employment, participants who had received CBT augmented VR were more likely to be competitively employed at five-year follow-up compared to those who had VR augmented with CR, with marginal significance for CBT. During the intervention period, CBT techniques could be offered directly in an employment setting. This may increase the utility of CBT, and highlight the impact of situated learning. When challenges arose in the work place, the job specialists and participants addressed them directly. This may imply that skills developed in a concrete work setting are more likely to be applied later on in similar settings. The results in this study may further indicate that the behavioral component of CBT is of particular importance in schizophrenia spectrum disorders. CR consisted of feedback from neurocognitive assessment, personal goals for the training, psychoeducation about cognitive impairment, and 2 h weekly of computer-based training with focus on transfer between training and work. Training was delivered by employment specialists. This ensured relevance both ways, i.e. from training setting to work setting and vice versa. Both cognitive interventions represent feasible routes to different types of employment. External factors must however also be taken into account when interpreting the results

from the current study. Site-specific labor markets may for example have influenced the number of participants in competitive employment.

Concerning gender, there was skewness in the sample in the current study, with almost 70% being male, with a higher proportion of men in the CR intervention group (78%) compared to the CBT intervention group (63%). No clear conclusion with regard to gender differences has been found in previous studies [41]; however, it has been proposed that women have a longer premorbid phase, allowing them to attain valuable occupational competence before onset of the disease. Demographic data also showed a statistically significant higher DOI in the CBT intervention group and a slightly higher PANSS score for positive symptoms in the CR intervention group (14.0 vs. 12.5). DOI did not emerge as a predictor for competitive employment in the regression analysis.

In conclusion, this study indicates that competitive employment is obtainable—and can be maintained over time—for a proportion of individuals with schizophrenia spectrum disorders. This is contrary to many what many clinicians, and society as a whole, may think regarding employment for individuals with severe mental illness. In this study, where all the participants exhibited some level of motivation to work, those with the best requirements, showed the highest probability of obtaining employment. Helping this group gain employment at an early stage, may lead to a favorable outcome by avoiding additional functional deficit.

5. Strengths and limitations

A major strength of this study is that five-year follow-up data on employment was extracted from mandatory registers on employment status. The study hence provides a reliable long-term outcome of a novel VR program augmented with CBT and CR. The extensive follow-up period enables us to examine and discuss aspects of the two interventions in terms of long-term functional effects. Limitations of the study include the lack of a randomized control group receiving standard VR services, which would have enabled us to further disentangle specific effective elements in the VR program. Thus, it remains uncertain what the CR and CBT really add to the VR intervention. A previous study by Christensen *et al.* in 2019 showed no additional effect of enhancing IPS with CR in Denmark [30]. It is also a limitation that we were unable to access any clinical, neurocognitive or functional data beyond employment status at five-year follow-up. Although we were unable to control whether or not participants were involved in other VR programs between 2- and 5-year follow-up, we view this as highly unlikely given the time-limitations of work-related welfare schemes. Thus, the effects of the JUMP interventions are likely to explain the findings in this study. The program was conducted in a Scandinavian welfare-society during a period where employment services and health services operated separate from each other, and thus was a novel program at the time. Given this structural setting, the study may be difficult to replicate in many countries.

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Disclosure statement

The authors have declared that there are no conflicts of interest in relation to the subject of this study.

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Egil W. Martinsen was a professor of psychiatry at the University of Oslo with particular research and clinical focus on CBT and physical exercise. He co-designed the current study. Sadly, professor Martinsenpassed away before the publication of the current article.

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