Asociación Colombiana de Psiquiatría ACP

Revista Colombiana de Psiquiatría

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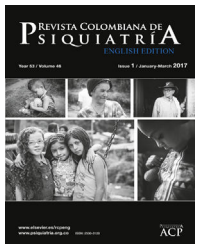

Original article

Efficacy of Metacognitive Training in a Chilean Sample of People with Schizophrenia

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ARTICLE INFO

Article history:
Received 27 May 2020
Accepted 28 December 2020
Available online 8 November 2022

Keywords:
Metacognition
Psychotherapy
Delusions
Schizophrenia

ABSTRACT

Introduction: Moritz et al.'s metacognitive training (MCT), a new development of cognitive therapy, is a manualised group training programme, designed to correct cognitive biases involved in the formation and maintenance of psychotic symptoms, especially delusions. We report on the efficacy of MCT in a Chilean sample of people with schizophrenia.
Methods: 50 outpatients from the Hospital Del Salvador in Valparaíso, Chile, were randomly assigned to the intervention group that received MCT or the control group that only received treatment as usual (TAU). Subjects were assessed at the beginning and end of the study with the Positive and Negative Syndrome Scale (PANSS), Cognitive Biases Questionnaire for Psychosis (CBQ-P) and Beck Cognitive Insight Scale (BCIS).
Results: Greater statistically significant improvements were recorded in the MCT group, both in symptoms and cognitive biases and in cognitive insight, than in the control group. When comparing both groups, significant results in favor of MCT were only observed in positive symptoms.
Conclusions: The results of this study suggest MCT is superior to TAU in treating positive symptoms. It was not possible to demonstrate its superiority in improving cognitive biases and cognitive insight.

Eficacia del entrenamiento metacognitivo en una muestra chilena de personas con esquizofrenia

Palabras clave:
Metacognición
Psicoterapia
Delirios
Esquizofrenia

RESUMEN

Introducción: El entrenamiento metacognitivo (EMC) de Moritz et al., una nueva dirección en terapia, es un programa de entrenamiento grupal manualizado, dirigido a corregir los sesgos cognitivos implicados en la formación y el mantenimiento de los síntomas psicóticos, principalmente los delirios. El objetivo de este estudio es evaluar la eficacia del EMC en una muestra chilena de personas con esquizofrenia.

DOI of original article: https://doi.org/10.1016/j.rcp.2020.12.006.
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Métodos: Se aleatorizó a 50 pacientes ambulatorios del Hospital Del Salvador de Valparaíso, Chile, al grupo de intervención que recibió el EMC o al grupo de control que solo recibió el tratamiento habitual. Se evaluó a los sujetos al inicio y al término del estudio mediante la escala de los síndromes positivo y negativo (PANSS), el cuestionario de sesgos cognitivos para psicosis (CBQ) y la escala de *insight* cognitivo de Beck (BCIS).

Resultados: En el grupo de EMC se registraron mayores mejorías estadísticamente significativas, tanto en síntomas y sesgos cognitivos como en *insight* cognitivo, que en el grupo de control. Al comparar ambos grupos, solo se observaron resultados significativos a favor del EMC en los síntomas positivos.

Conclusiones: Los resultados de este estudio indican que el EMC es superior al tratamiento habitual en el tratamiento de los síntomas positivos. No fue posible demostrar su superioridad en la mejoría de los sesgos cognitivos y el *insight* cognitivo.

Introduction

Antipsychotic drugs are the first-line treatment for people with schizophrenia. However, many patients reject or stop taking the treatment.[1] Adherence to antipsychotic medication is often poor and it has been reported that up to 70% of individuals do not take the drugs as prescribed.[2] Furthermore, the drugs are only partially or minimally effective in around 40% of cases.[3] Therefore, the need for psychological therapies for psychosis is increasingly recognised and, in this context, cognitive behavioural therapy (CBT) has emerged as a potentially effective therapy for the treatment of schizophrenia.[4] The reason for this is based on growing evidence of the presence of cognitive biases (i.e. systematic errors in the thinking of individuals that maintain the individuals' belief in the validity of their ideas despite evidence to the contrary[5]) in delusional patients who tend to develop delusional thinking.[6] In other words, cognitive biases may be associated with the development and maintenance of delusions.[7] The most consistent evidence is related to jumping-to-conclusions (JTC) and attribution biases. The JTC bias refers to the tendency to gather little information before making a decision, thereby increasing the likelihood of inaccurate beliefs being formed.[8] Several studies show that patients with delusions have a greater tendency to JTC than people without mental disorders or with other mental conditions.[9]

Attribution biases, defined as the tendency to attribute the cause of negative events to oneself or to others instead of to the circumstances, have been investigated primarily in persecutory delusions[10] and, to a lesser extent, in delusions of grandeur.[11] Delusional patients use external attributions for negative events, or more specifically, they personalise attributions (i.e. they blame other people instead of the circumstances for the negative events).[12]

Although research has focused primarily on JTC and attribution biases, people with psychosis have been described to have a broader range of cognitive biases, such as those originally described by Beck for emotional disorders.[13] According to some clinical observations, thinking errors commonly observed in people with psychosis include biases such as dichotomous thinking, emotion-based reasoning and catastrophising.[8]

CBT for schizophrenia is active, structured, time limited and can be delivered in individual or group formats. It aims to explore cognitive distortions, erroneous interpretations and dysfunctional beliefs associated with positive and negative symptoms of the disease.[14] It has proven to be effective when administered in combination with antipsychotic drugs. However, studies report significant heterogeneity in effect sizes.[15]

Metacognitive training (MCT) by Moritz et al., a new direction in therapy, is an amalgam of psychoeducation, cognitive rehabilitation and CBT.[16] The aim is to "sow the seeds of doubt", or rather encourage patients to lose confidence when evidence is lacking and to collect more information before making decisions.[17] Given that psychosis is not a sudden or instant event but is instead often preceded by gradual changes in the person's evaluation of his/her own knowledge and the social environment, the strengthening of metacognitive skills may act as prophylaxis for possible relapses and prevent the onset of new psychotic episodes.[18]

The aim of MCT is to correct cognitive biases involved in the formation and maintenance of psychotic symptoms, such as attribution biases, JTC, overconfidence in errors and bias against disconfirmatory evidence (i.e. the tendency to maintain beliefs despite evidence to the contrary), as well as negative cognitive schemata and dysfunctional coping styles fostering depression and also impaired social cognition and theory of mind.[19] This training works primarily at metacognitive level, by keeping the patient's analysis of the personal content of delusions at a minimum, which facilitates the participation of patients who are not willing to talk about their psychotic experiences, often due to suspicion, ambivalence or shame (problems that are treated with individual interventions).[18]

Unlike other authors who use the term to describe the ability to attribute mental states to others and to oneself,[20] Moritz uses the term metacognition in line with the definition given by Flavell,[21] i.e. "thinking about one's thinking", to refer especially to metacognitive knowledge, or awareness of your own and of others' cognitive processes, and metacognitive experience as conscious reflection about the same things.

Therefore, MCT captures 2 of the 4 components of metacognition described by Flavell.[22]

MCT is currently available in 37 languages and has been recommended as a treatment for psychosis by the Australian Psychiatric Association, the German Psychiatric Association and the German Psychological Association.[23]

Pankowski et al. analysed the effectiveness of MCT for patients with schizophrenia through a narrative systematic review of studies published between 2009 and 2015. They found a larger effect size for severity of delusions, a small effect size regarding negative symptoms reduction, a large effect size for insight improvement, a positive impact on cognitive biases severity and improvement in some aspects of neurocognitive functions. Symptom improvements were sustained until at least 6 months of follow-up.[24]

Over the years, several meta-analyses have been published on the effectiveness of MCT. The 2 most recent meta-analyses show a small-to-medium effect size for symptoms. Adherence tends to be good, and patients have reported their preference of MCT over other treatments at a large effect size.[23,25] The meta-analysis by Tang et al. also indicates a lasting effect for a follow-up period of 6 months after the intervention.[26]

Unlike other psychological therapies, including CBT and family interventions, which have a small-to-medium effect size and which are difficult to implement in practice due to problems in training the therapists and ensuring effective models of delivery,[27] MCT is a manualised group training programme and can therefore be easily implemented in a clinical setting by therapists with basic training. There are reports of it being used not only by psychiatrists and/or psychologists but also by other professionals who work in the field of mental health, such as nurses and occupational therapists.[28,29] After considering the above, and due to the limited access to psychological interventions by patients with psychosis at Hospital Del Salvador in Valparaíso, Chile, MCT began to be used in 2018. The objective of this study is to evaluate the effectiveness of this treatment modality in a Chilean sample of people with schizophrenia.

Methods

This was a randomised clinical trial including a sample of 46 outpatients from Hospital Del Salvador in Valparaíso, Chile (mean age 26.69 years; 30.43% female). All patients had been diagnosed with schizophrenia according to criteria of the *Diagnostic and Statistical Manual of Mental Disorders, Fifth Edition* (DSM-5)[30] and were being treated with antipsychotic drugs. Their ages ranged between 18 and 45 years. Exclusion criteria included serious medical or neurological comorbidity, a history of severe visual or hearing disability and substance dependence.

A total of 50 patients who met the inclusion criteria were selected and these were randomised to either the active arm, which received MCT, or to the control group, which only received treatment as usual, consisting of regular check-ups with the psychiatrist and nurse. All subjects in the control group could access MCT after 3 months. In the end, the sample comprised 25 patients in the MCT group (who completed at least 7 of the 10 programme sessions) and 21 subjects in the control group. Following initial recruitment, 4 subjects were excluded from the control group because changes were made to their drug regimen.

The study protocol was explained to all participants, who then signed an informed consent form. The study was approved by the Ethics Committee of the Valparaíso-San Antonio Department of Health.

Procedures

Patients in the intervention group were assessed at the beginning and end of MCT. Patients in the control group were assessed upon inclusion in the study and 10 weeks after the first assessment.

Assessment

All participants were assessed by a psychiatrist using the Positive and Negative Syndrome Scale (PANSS).[31] The scale consists of 7 items for positive symptoms (PANSS-P), 7 items for negative symptoms (PANSS-N) and 16 items for general psychopathology (PANSS-G). The psychiatrists who performed this assessment did not participate in the study design and did not know if the patients had received MCT or only treatment as usual.

The patients were also assessed using the following self-report questionnaires, with a response time of between 20 and 30 min:

Cognitive Biases Questionnaire for Psychosis (CBQ)[8]: This consists of 30 items that assess the 5 cognitive biases most often associated with psychosis: JTC, dichotomous thinking (DT), intentionalising (I), emotional reasoning (ER) and catastrophising (C). There are 6 possible scenarios for each bias, related to 2 items, half relating to anomalous perceptions (AP) and the other half relating to threatening events (TE). Participants completing the questionnaire must choose from 3 statements that represent what they would think in each situation. Answers are given 1 point for absence of bias, 2 points for possible presence of bias and 3 for likely presence of bias. The potential range of scores is 30–90 (15–45 for each item and 6–18 for each thinking bias).

Beck Cognitive Insight Scale (BCIS)[32]: This consists of 15 phrases about how people think and feel. The subject must mark with an X whether he/she does not agree at all, agrees slightly, agrees a lot or completely agrees with each statement. The scale has 3 indices: self-reflectiveness (SR), self-certainty (SC) and a composite index (SR-SC).

Intervention

The MCT consists of 10 modules that cover the following topics: attributional style, JTC I and II, changing beliefs, theory of mind I and II, memory, mood and self-esteem, self-esteem and self-stigma. The group is open (i.e. patients can continue to be added to any module) since it is not necessary to follow a strict order of sessions. Patients will form groups of 3–10 subjects and will complete 10 sessions, on a weekly basis, lasting 45–60 min each.[18]

The MCT is directed by two people, a psychiatrist and a psychologist.

Table 1 – Results with the CBQ in the MCT and control groups after treatment.

Index	[0,2-3]Mean difference		[0,4-5]t		[0,6-7]p	
CBQ T	MCT	CG	MCT	CG	MCT	CG
	4.4400	2.2381	3.3885	1.9965	0.0012	0.0298
TE	MCT	CG	MCT	CG	MCT	CG
	2.7600	1.6667	3.2811	3.1897	0.0016	0.0023
AP	MCT	CG	MCT	CG	MCT	CG
	1.6800	0.5714	2.5164	0.7138	0.0095	0.2418
I	MCT	CG	MCT	CG	MCT	CG
	0.4000	0.5714	1.5894	2.0342	0.0625	0.0277
C	MCT	CG	MCT	CG	MCT	CG
	1.2400	0.3810	3.5176	1.1394	0.0009	0.1340
DT	MCT	CG	MCT	CG	MCT	CG
	0.4800	–0.1429	1.2661	–0.3536	0.1088	0.6363
JTC	MCT	CG	MCT	CG	MCT	CG
	0.6400	0.6190	1.6547	1.4854	0.0555	0.0765
ER	MCT	CG	MCT	CG	MCT	CG
	1.7200	0.8095	4.9297	1.9126	<0.0001	0.0351

AP: anomalous perceptions; C: catastrophising; CBQ T: cognitive biases questionnaire total score; CG: control group; DT: dichotomous thinking; ER: emotional reasoning; I: intentionalising; JTC: jumping to conclusions; MCT: metacognitive training; TE: threatening events.

Table 2 – Results with the PANSS in the MCT and control groups after treatment.

Index	[0,2-3]Mean difference		[0,4-5]t		[0,6-7]p	
PANSS-P	MCT	CG	MCT	CG	MCT	CG
	2.5909	–0.2381	5.0295	–0.2856	<0.0001	0.6120
PANSS-N	2.2727	1.4286	5.0974	1.8401	<0.0001	CG 0.0403
PANSS-G	6.4091	0.9048	6.6797	0.7879	<0.0001	0.2200

CG: control group; MCT: metacognitive training; PANSS: positive and negative syndrome scale; PANSS-G: general psychopathology; PANSS-N: negative symptoms; PANSS-P: positive symptoms.

Treatment as usual: patients who only attend their regular check-ups with a psychiatrist and a nurse.

Statistical analysis

The comparison of the therapies was divided into 2 analyses. The aim of the first was to compare the mean scores achieved with the assessment instruments at the beginning and end of the treatments (MCT and treatment as usual). The objective of this analysis was to determine if, on average, a statistically significant improvement was seen in patients receiving the study treatments. The second analysis evaluated whether there are statistically significant differences between the two treatments. Both analyses were performed using different techniques. The first was based on a paired Student's *t*-test to compare means in paired samples, while the second was based on an independent Student's *t*-test to compare means in independent samples. The central idea of this comparison in 2 different dimensions is that the treatments used achieve an improvement in patients, based on the mean score achieved with the assessment instruments being considered, but that the MCT-based treatment also generates better results in patients than treatment as usual. The statistical significance considered was $P < .05$.

The correlation between the initial scores achieved with the assessment instruments and the change in score observed following the intervention was also analysed using Pearson's linear correlation coefficient.

Results

Normality of the data was tested using the Jarque-Bera test.

The MCT group was 44% female and the mean age was 27.52 ± 8.42 years, while the control group was 14.29% female and the mean age was 25.71 ± 4.72 years.

The treatment as usual group showed post-intervention statistically significant improvements in total score and in the items threatening events, intentionalising and emotional reasoning on the CBQ scale (Table 1) and in negative symptoms on the PANSS scale (Table 2). No changes were observed on the BCIS scale (Table 3).

In turn, following the intervention, the MCT group exhibited statistically significant, favourable changes in total score, threatening events, anomalous perceptions, catastrophising and emotional reasoning on the CBQ scale (Table 1), in positive symptoms, negative symptoms and general psychopathology on the PANSS scale (Table 2) and in the SR-SC index of the BCIS scale (Table 3).

Nevertheless, on comparing the effect of MCT with the changes observed in the control group, only one statistically significant difference was observed in the improvement of positive symptoms with MCT (Tables 4–6).

The correlation between the initial scores achieved with the assessment instruments and the difference in score before and after treatment was analysed using Pearson's linear correlation coefficient and no statistically significant linear correlations were observed. All correlations were positive, although <0.9.

Discussion

Our study shows a tendency towards a greater benefit after treatment in patients who received and completed MCT compared to those patients who only received treatment as usual, both in cognitive biases and cognitive insight and in symptoms. According to our results, there is no association between initial test scores and the size of change after the intervention, so it can be deduced that the level of initial severity does not determine outcomes. However, it was only possible to demonstrate the superiority of MCT over treatment as usual in the improvement of positive symptoms.

The lack of more conclusive results may be related to sample size, which limits the power of the study.

In addition, results obtained with the CBQ may be determined by the psychometric characteristics of the test since, although the scores may range between 30 and 90 (15–45 for each item and 6–18 for each thinking bias), publications that use this scale show scores in a narrower range, similar to that found in our study.[33,34] Likewise, the authors of the scale[8] report average total scores of 47.3 ± 10.4, 45.5 ± 9.4 and 36.5 ± 2.7 for the groups of patients with psychosis, depression and from the control group with no psychiatric disorder, respectively.

Similar to our results, in which variations of 4.44 points after treatment in the MCT group and 2.23 points in the control group are observed, Gaweda et al.[33] reported a decrease in CBQ total score of 3.82 after MCT, while the treatment as usual group remained unchanged. Ahuir et al.[34] recorded a decrease of 3.6 points in CBQ total score in those subjects who were first assigned to a psychoeducation group and then MCT, and 5.9 points when the order of interventions was reversed. Ishikawa et al.,[28] however, only reported a significant improvement in the JTC bias score.

The absence of significant differences in CBQ score after treatment, despite the significant improvement in positive symptoms, may be explained by a non-specific beneficial

Table 3 – Results with the BCIS in the MCT and control groups after treatment.

Index	[0,2-3]Mean difference		[0,4-5]t		[0,6-7]p	
SR	MCT	CG	MCT	CG	MCT	CG
	–0.6000	–0.8095	–1.0142	–0.8008	0.1603	0.2163
SC	0.7600	0.5714	1.1904	0.8176	0.1228	0.7884
SR-SC Index	–1.3600	–1.2857	–1.7140	–1.2644	0.0497	0.1113

CG: control group; MCT: metacognitive training; SC: self-certainty; SR: self-reflectiveness; SR-SC Index: self-reflectiveness minus self-certainty.

Table 4 – Comparison of results between the MCT group and the control group with the CBQ.

	[0,2-3]Pre-intervention		[0,4-5]Post-intervention	
Type	MCT	CG	MCT	CG
CBQ T	44.40 ± 8.22	43.43 ± 6.41	39.96 ± 6.46	41.19 ± 6.00
Tobs	0.384	–0.580		
p	0.7032	0.2829		
TE	23.84 ± 5.54	22.86 ± 3.68	21.08 ± 3.88	21.19 ± 3.79
Tobs	0.606	–0.085		
p	0.5488	0.4665		
AP	20.56 ± 3.38	20.57 ± 3.46	18.88 ± 3.42	20.00 ± 3.39
Tobs	–0.010	–0.969		
p	0.9922	0.1698		
I	7.96 ± 1.54	8.52 ± 2.02	7.56 ± 1.58	7.95 ± 1.60
Tobs	–0.938	–0.728		
p	0.3553	0.2360		
C	9.12 ± 2.45	8.43 ± 1.57	7.88 ± 1.96	8.05 ± 1.66
Tobs	0.688	–0.565		
p	0.4963	0.3945		
DT	8.44 ± 1.96	7.90 ± 1.81	7.96 ± 1.51	8.05 ± 1.43
Tobs	0.833	–0.175		
p	0.4111	0.4311		
JTC	9.96 ± 2.19	9.67 ± 1.62	9.32 ± 1.52	9.05 ± 1.60
Tobs	0.443	0.516		
p	0.6607	0.6954		
ER	8.96 ± 1.90	8.90 ± 2.26	7.24 ± 1.45	8.10 ± 2.12
Tobs	0.079	–1.411		
p	0.9378	0.0838		

AP: anomalous perceptions; C: catastrophising; CBQ T: cognitive biases questionnaire total score; CG: control group; DT: dichotomous thinking; ER: emotional reasoning; I: intentionalising; JTC: jumping to conclusions; MCT: metacognitive training; TE: threatening events.
Values are expressed as mean ± standard deviation.

Table 5 – Comparison of results with the PANSS between the MCT and control groups.

	[0,2-3]Pre-intervention		[0,4-5]Post-intervention	
Type	MCT	CG	MCT	CG
PANSS-P	10.36 ± 3.29	10.38 ± 2.99	7.77 ± 1.45	10.62 ± 4.53
Tobs	–0.016		–2.591	
p	0.9872		0.0071	
PANSS-N	14.41 ± 4.32	16.19 ± 5.95	12.14 ± 4.09	14.76 ± 6.45
Tobs	–1.024		–1.462	
p	0.3133		0.0766	
PANSS-G	26.77 ± 6.91	24.52 ± 5.49	20.36 ± 4.56	23.62 ± 6.87
Tobs	1.051		–1.676	
p	0.3010		0.0516	

CG: control group; MCT: metacognitive training; PANSS: positive and negative syndrome scale; PANSS-G: general psychopathology; PANSS-N: negative symptoms; PANSS-P: positive symptoms.
Values are expressed as mean ± standard deviation.

Table 6 – Comparison of results with the BCIS between the MCT and control groups.

	[0,2-3]Pre-intervention		[0,4-5]Post-intervention	
Type	MCT	CG	MCT	CG
SR	14.40 ± 3.85	11.76 ± 5.26	15.00 ± 3.93	12.57 ± 5.70
Tobs	1.710		1.487	
p	0.0967		0.0732	
SC	9.92 ± 3.75	10.33 ± 3.43	9.16 ± 4.03	9.76 ± 3.51
Tobs	–0.338		–0.467	
p	0.7377		0.6782	
SR-SC	4.48 ± 4.93	1.52 ± 6.79	5.84 ± 5.01	2.81 ± 7.36
Tobs	1.488		1.443	
p	0.1461		0.0792	

CG: control group; MCT: metacognitive training; SC: self-certainty; SR: self-reflectiveness; SR-SC Index: self-reflectiveness minus self-certainty. Values are expressed as mean ± standard deviation.

effect of MCT, regardless of the correction of individual cognitive biases.

Future research may increase sample size, consider other instruments to assess changes in cognitive biases associated with psychosis and expand on the study of mechanisms of action of MCT. There is also uncertainty regarding other potential benefits of the treatment, which have not been measured in this study, such as changes in self-esteem and quality of life of people receiving MCT. Leighton et al. reported improvements in self-esteem and quality of life up to 3 years after MCT.[19] Similar results were recorded by Favrov et al.[35]

It is also important to note that our results indicate that MCT is superior to receiving only treatment as usual for positive symptoms of schizophrenia, which is especially encouraging for patients who are refractory to antipsychotic drugs.

Finally, we believe that the possibility of mass use of a manualised, highly cost-effective treatment that does not require significant training for therapists is promising.

Limitations

The Spanish version of the CBQ was used. Some words and phrases were modified as they are commonly used in Spain but not in Chile and patients would not have understood them. Nevertheless, the instrument itself was not changed.

Neither the language nor the process of the BCIS were modified to match the type of Spanish spoken in Chile. However, we believe it does not contain any words or phrases that are not easily understood in Chile, which was corroborated by the patients who answered it.

The psychiatrists who performed the psychopathological assessment of patients using the PANSS had experience in the use of this scale. Nevertheless, no standardisation was performed.

Conflicts of interest

None.

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