Case Report

Journal of Iranian Medical Council, Volume 7, Issue no. 1
http://dx.doi.org/10.18502/jimc.v7i1.14227

Efficacy of Individual Metacognitive Training in Patients with Schizophrenia: A Case Study

Zahra Bahram Bidoni[1], Vandad Sharifi[2] and Maryam Masoomi[2]*

1. Department of Psychiatry, Razi Hospital, School of Medicine, Tehran University of Medical Sciences, Tehran, Iran
2. Department of Psychiatry, Roozbeh Hospital, School of Medicine, Tehran University of Medical Sciences, Tehran, Iran

*** Corresponding author**
Maryam Masoomi, MD
Department of Psychiatry, Roozbeh Hospital, School of Medicine, Tehran University of Medical Sciences, Tehran, Iran
Tel: +98 21 6672 7062
Email: Maryamasoomi@gmail.com

Received: 7 Jan 2023
Accepted: 27 May 2023

Citation to this article
Bahram Bidoni Z, Sharifi V, Masoomi M. Efficacy of Individual Metacognitive Training in Patients with Schizophrenia: A Case Study. *J Iran Med Counc.* 2024;7(1):180-86.

Abstract

Background: Several cognitive biases may be involved in the pathogenesis and continuation of symptoms in schizophrenia. Metacognitive Training (MCT) is a treatment program that targets cognitive bias in schizophrenia. The current work aimed to evaluate the influence of MCT on schizophrenia using a single-subject design.

Methods: Five patients with schizophrenia received metacognitive training. The treatments were done for at least four weeks, two sessions per week (number of sessions ranged from 8 to 18 sessions). The MCT consists of two sets of eight modules that target common cognitive biases and problem-solving difficulties in schizophrenia. Baseline assessment was performed using the Birchwood Insight Scale (BIS), the Positive and Negative Syndrome Scale (PANSS), the Psychotic Symptom Rating Scales (PSYRATS), the Global Assessment of Functioning (GAF), WHOQOL-BREF and the Peters *et al*, Delusions Inventory (PDI). The post intervention assessments included the aforementioned measures as well as treatment satisfaction. The follow-up assessments were conducted three and six months later. Data analysis was administered employing visual analysis diagrams, percentage of recovery and the Reliable Change Index (RCI).

Results: MCT was associated with a reduction in positive and negative symptoms (up to 18.7, 100 and 100% on the PANSS, PSYRATS and PDI, respectively) in individuals with schizophrenia, and its effects diminish over time. Insight showed significant improvement, but it was mainly the insight into symptoms. In patients with low baseline score of Quality of Life (QOL), an improvement was reported. The GAF did not change significantly.

Conclusion: MCT can be suggested as an adjunct therapy to decrease the symptoms of schizophrenia and improve the patients' insight. Patients with more symptoms and lower levels of insight, performance and QOL seem to respond better to MCT. Randomized clinical trials are required.

Keywords: Metacognition, Metacognitive training, Schizophrenia

Introduction

Schizophrenia is known as a severe psychiatric disorder with low Quality of Life (QOL) and high treatment costs (1). This complex abnormality has a broad range of clinical indications and symptoms such as positive and negative symptoms (2). Antipsychotic medications are choices of treatment, but they have moderate effect size on the primary positive syndrome relative to placebo, and one-quarter of all medicated patients have been relapsed (1). For medication-resistant patients, psychotherapy is a viable strategy. Psychotherapy and psychopharmacology are complementary approaches: psychotherapy can raise insight and improve medication adherence and psychopharmacology can manage disorganization and agitation (3). Recently, Metacognitive Training (MCT) has gained more attention and gained its place in the treatment of psychosis. It targets cognitive deficits underlying psychotic symptoms. This approach focuses on the metacognitive damages of the patients through changing the "cognitive infrastructure" of delusional thinking (4). MCT is about the way that individuals think and it supposes that the problem is caused by rigid and repetitive thinking styles in reaction to negative thoughts, perceptions, and views. The goal of MCT is to make patients aware of thinking biases and help self-recognition (5).

Poor social functioning due to cognitive deviations and the deficiency of metacognitive skills can lead to an increase in positive symptoms in schizophrenia. Thus, we need certain techniques to address the cognitive processes involved in insight and metacognition abilities. MCT enhances the reflection of patients on cognitive errors and makes better their problem-solving skills (2). So far, several clinical trials have shown the effectiveness of MCT in improving the symptoms of schizophrenia, especially positive symptoms. However, to the best of our knowledge, none of the previous studies have comprehensively investigated the effects of this treatment. Therefore, our goal is to use a single-case design, which has a special place in neuropsychology and psychiatry studies, to investigate various aspects of the effects of MCT on patients with schizophrenia, including their QOL and global functioning in addition to disease-specific symptoms.

Materials and Methods

Participants

Five people with a confirmed diagnosis of schizophrenia by experienced psychiatrists were selected from the outpatients of Roozbeh Hospital based on a clinical structured interview for the Diagnostic and Statistical Manual of Mental Disorders (DSM-IV-TR). The participants were enrolled from January 2019 to September 2019. The inclusion criteria were as follows: Age 18 to 45 years, educational level higher than the middle school, having positive symptoms (moderate to high in initial tests), no change in medication in the past month, not receiving Electroconvulsive therapy (ECT) in the past two months, stable patient condition and no acute psychosis. The exclusion criteria were: borderline intellectual functioning or mental retardation based on the history and interviews, drug/alcohol consumption, severe neurological disease, thought disorder, hostility and extreme aggression, worsening of symptoms or requiring change of medication (Table 1).

Study design

This research had a single-subject experimental design with pretest-posttest evaluations. All the subjects gave written informed consent, and there was no financial compensation for participation. The first phase of baseline assessment was performed using the Birchwood Insight Scale (BIS), Positive and Negative Syndrome Scale (PANSS), Psychotic Symptom Rating Scales (PSYRATS), Global Assessment of Functioning (GAF), Quality of Life Inventory (QOLI) and Peters *et al*, Delusions Inventory (PDI). Post-intervention assessment with basic assessment tools and treatment satisfaction questionnaire were done within two weeks after the intervention. The initial follow-up assessments were done three months after the intervention and the secondary follow-up six months after the intervention. The results of all the assessments before and after therapeutic intervention were collected by a second researcher to prevent result bias by therapist. The treatments were done for at least four weeks, two sessions per week (number of sessions ranged from 8 to 18 sessions). Each session lasted for one hour. MCT was performed individually in the hospital setting by a psychiatric

Table 1. Baseline characteristics of the patients with schizophrenia

Patient	Age (years)	Sex	Marital status	Education (years)	Duration of illness (years)	Anti-psychotic medication dosage	The equivalent dose of chlorpromazine (*mg/day*)	Number of treatment sessions
1	27	Male	Single	8	12	Clozapine 350 *mg*	700	18
2	32	Male	Single	16	17	Trifluoperazine 20 *mg*	400	8
3	42	Female	Single	18	5	Clozapine 350 *mg*	700	18
4	31	Male	Single	12	20	Quetiapine 200 *mg*	267	10
5	41	Female	Single	16	3	Trifluoperazine 8 *mg*	100	10

assistant. All the participants followed their routine treatment during MCT and follow-ups. This research was confirmed by the Ethics Committee of Tehran University of Medical Sciences.

Intervention

The MCT consists of two sets of eight modules that target common cognitive biases and problem-solving difficulties in schizophrenia. The modules start with psycho-education and become normalized with examples and exercises. Domain is described and the distortion of human cognition is discussed. Then, the pathological extremes are shown for every bias in cognition. It should be explained how exaggeration of thinking biases results in problems and delusions. The participants share their own experiences. The patients learn to displace cognitive traps and dysfunctional coping strategies with more helpful strategies.

Assessments

PANSS: It is a psychological tool to assess the symptoms of schizophrenic patients (6). It has 30 items and is completed by a clinically-trained researcher according to the reports of the family and caregivers. Its inter-rater reliability was estimated to be high to excellent ranging from 0.84 to 0.93.

PSYRATS: The PSYRATS illustrates possible separations in various aspects of positive symptoms, and assesses the severity of different dimensions of delusions and verbal hallucinations (7). It has good to excellent test-retest reliability, inter-rater reliability, validity and internal consistency in both first-episode and chronic patients (8).

WHOQOL-BREF: It contains 26 items to assess general QOL and general health, as well as four areas of physical health, mental health, social relations, and environmental health (9). The WHOQOL-BREF has good to excellent test-retest reliability, inter-rater reliability, validity, and internal consistency in different Iranian clinical population.

PDI: This questionnaire measures delusional and pseudo-psychotic beliefs in three dimensions of distress, preoccupation, and conviction. It has 40 items, and in case of a positive answer to each question (belief), the subject is asked to report the level of distress, preoccupation, and conviction in it. The validity and reliability of this instrument have been reported to be very good (10,11).

GAF: The GAF rates illness severity in psychiatry. It assesses patients' overall functioning level. The concurrent validity of this questionnaire with several relevant scales has been reported to be favorable. Also, reliability of ICC >0.7 has been reported for this questionnaire.

Birchwood Insight Scale (BIS): The BIS is an eight-item self-report scale designed to assess awareness of illness and symptoms and insight into the need for treatment (12). This tool has high internal reliability (Cronbach's alpha= 0.75) and good test-retest reliability.

Satisfaction with the treatment questionnaire: For the acceptability and feasibility of MCT, the

patients were asked 10 questions on a five-point Likert scale (13).

Statistical analysis

First, we used visual inspection and chart analysis. Moreover, recovery percentage as well as Reliable Change Index (RCI) (14) were utilized to analyze data from single-subject experimental studies. In the RCI scheme, if the amount of changes or differences between pre- and post-treatment is more than 1.96, it can be deduced that the change obtained is due to the therapeutic intervention and the outcome is not accidental.

Results

All the patients regularly participated in at least one course of treatment (eight sessions). Pre- and post-intervention assessments and follow-ups were performed for all the patients.

Recovery percentage

Except patient 2 who reported recovery (16.6%) after the intervention and at the three-month follow-up, GAF reported zero recovery percentage in the rest of the patients. For PANSS, in patients 1, 2 and 4, the highest recovery percentage was obtained after the intervention (-11.1, -18.7, -10.2) and the recovery rate decreased in the follow-up sessions. In patient 3, the greatest improvement was observed in the three-month follow-up (-13.5), and the percentage of recovery in patient 5 increased over time (-26.5 at the six-month follow-up). For QOL, in patients 2, 3, and 5, after the intervention and follow-up, the percentage of recovery was negative, indicating a drop in this index. For BIS, in patient 4, the insight fell first, but returned to baseline over time. In patients 1 and 5, the percentage of recovery decreased during follow-up. Patient 2 showed an improvement in the percentage of recovery during the follow-up (Figure 1).

For PSYRATS-hallucination, in patients 2, 3, 4, and 5, after the intervention, a good recovery percentage (-23.5, -100, -30.4, -100) was found regarding auditory hallucinations; this improvement continued until the six-month follow-up. Patient 1 showed improvements during the three-month follow-up (-52%). The percentage of recovery in the PSYRATS-delusion was significant in all the patients during the post intervention and follow-ups. For PDI, in patients 1, 2, 4, and 5 after the intervention and at follow-ups, a significant improvement was achieved (-24.7, -23.6,

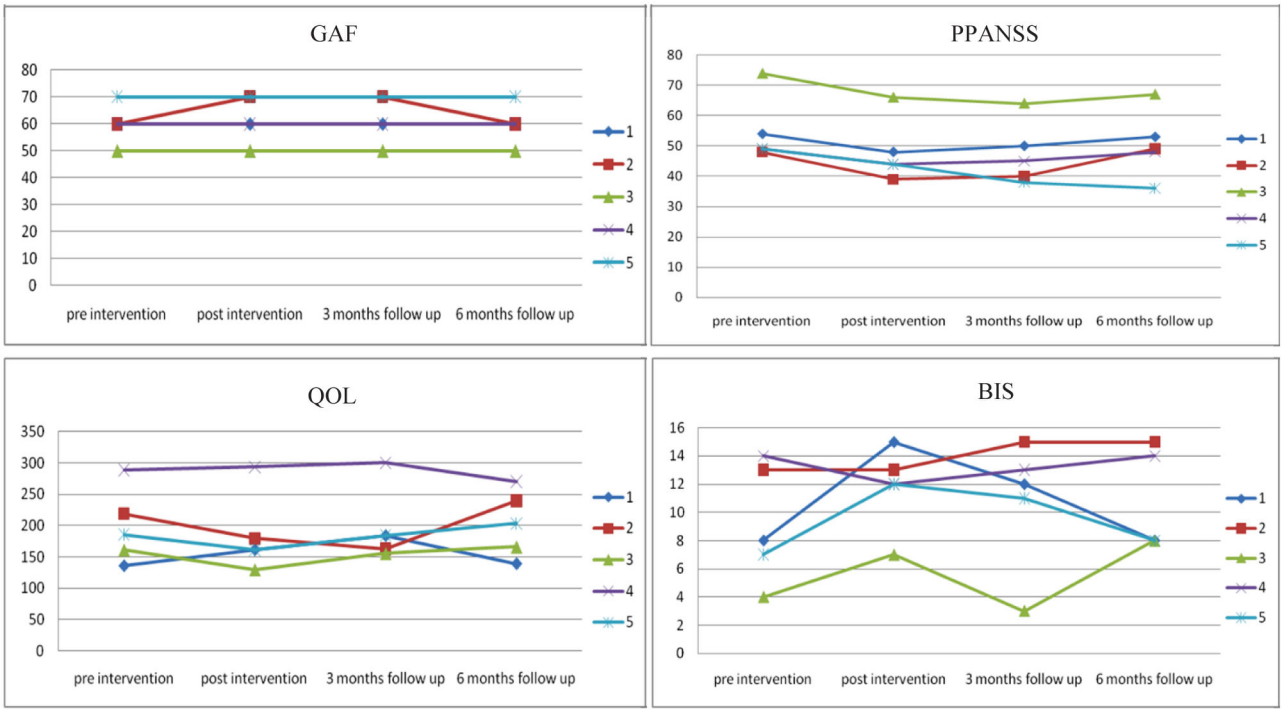

Figure 1. changes of the patients' score in Birchwood Insight Scale (BIS), Positive and Negative Syndrome Scale (PANSS), Global Assessment of Functioning (GAF), Quality of Life (QOF).

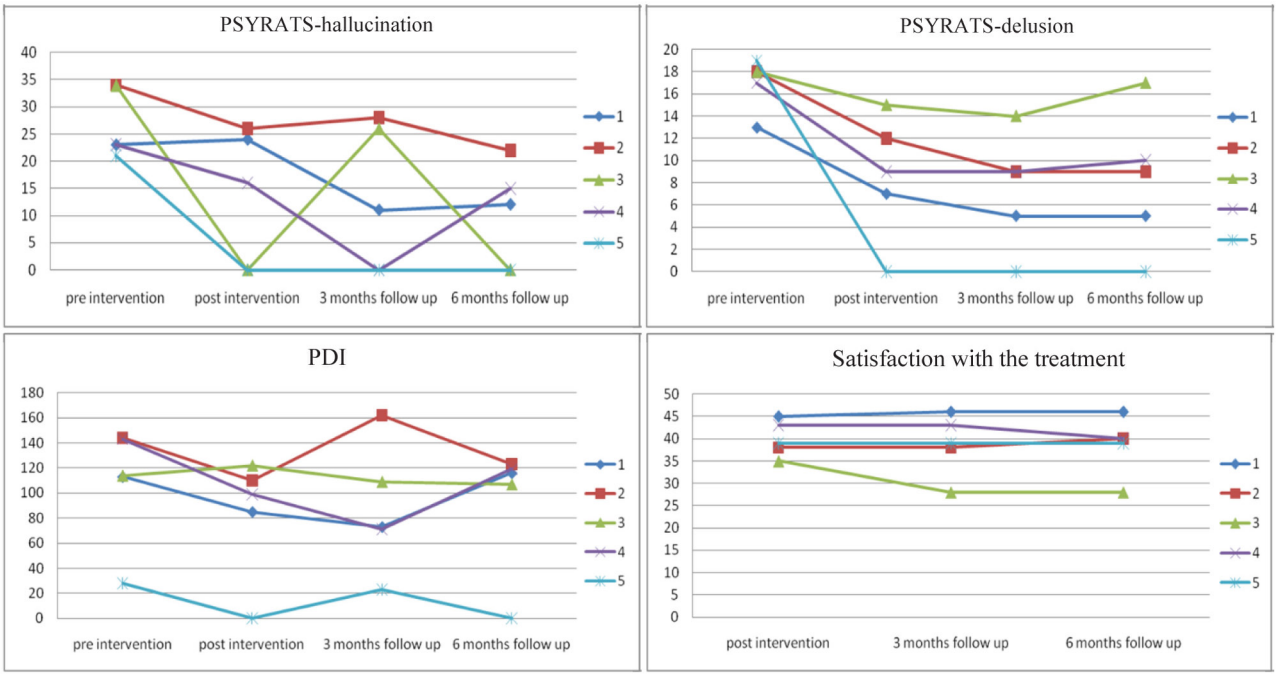

Figure 2. Changes of the patients' score in PSYRATS-hallucination, Psychotic Symptom Rating Scales (PSYRATS)-delusion, PDI and satisfaction with treatment.

-30.7, -100) (Figure 2).

RCI analysis

For PANSS, in patients 1, 2 and 4, after the intervention and at the three-month follow-up, the RCI was more than 1.96 which means that the changes observed in patients were significant. In patient 3, the highest rate of this index was observed at the three-month follow-up, but the changes were significant at all three time points. In patient 5, there was a significant change in the course of the study, and the RCI was highest at the six-month follow-up. For QOL, in patients 2, 3 and 5, patient-reported QOL decreased and a significant negative RCI was obtained. In patient 1, RCI was significant after the intervention and at the three-month follow-up.

Discussion

In this study, the efficacy of MCT for schizophrenia was evaluated. Unlike most previous studies, treatment was done individually for the patients. Furthermore, we investigated the effect of MCT on delusion dimensions, QOL and global functioning. It seems that MCT has positive effects on some of the studied variables, which can be slight or meaningful, sustained or temporary.

Schizophrenic symptoms on the PANSS generally decreased in all the patients, but returned to baseline in three patients during follow-up. RCI analysis for this scale was also significant in all the patients after the intervention and at the three-month follow-up. This finding is consistent with the results of previous studies (4,15). The percentage of recovery in this study was lower than the study with 10 patients and the same number of sessions, but with a longer intervention (nine-month) (16). Therefore, it seems that the duration of the intervention is very important in its effectiveness. The positive symptoms of schizophrenia significantly decreased in four patients after the intervention and slightly decreased in one patient. Previous studies reported a moderate effect of MCT on positive symptoms (4,17). A recent meta-analysis demonstrated small to moderate effect of MCT on positive symptoms and delusions (18). Negative symptoms in two patients significantly decreased after the intervention, and this trend continued to decrease during the follow-ups. In fact, in two patients who had more negative symptoms before the start of intervention, the reduction in negative symptoms was more than other patients.

In most of other studies, these symptoms were not emphasized, and in those that were reviewed, no significant improvement was observed (16,19,20).
All the five patients during the intervention showed a decrease in the hallucination scale. Some previous studies, consistent with the findings of the present study, reported significant positive effects of MCT on the hallucination symptoms (1,17,20). The total score of QOL during the study in patients slightly shifted to better or worse, but at the end of the study, four patients returned to the primary level and only one patient reported improvement in QOL after a six-month follow-up, which can be justified by a significant increase in patient insight. A previous study reported similar results for the effects of MCT on QOL in patients with schizophrenia (19). Generally, in this treatment, if the initial level of QOL was lower, recovery would be greater and the greatest improvement was in mental health and social relationships. Finally, all the patients had a high degree of satisfaction with treatment. In two patients, satisfaction slightly decreased during the follow-up period. This report is in line with the results of other researches (13).

Limitations

The number of sessions and duration of each session were high, which required a high level of collaboration among patients and their family members. The necessity of not changing the medication during the intervention, due to long duration of the study, required a great deal of coordination with the patients' psychiatrist.

Conclusion

In summary, the most significant effect of this treatment was on the positive symptoms of schizophrenia. In this treatment, improvement in hallucinations, delusions and dimensions of the delusions was significant. The greatest improvement in delusions occurred after the intervention and at the three-month follow-up. This suggests that reminder sessions and longer interventions are required. Improvement in hallucinations was more stable. In general, patients who have more positive and negative symptoms and lower levels of insight and performance and lower QOL will experience more improvement after MCT. MCT should be performed with more sessions and longer intervention periods as well as reminder sessions. Finally, conducting RCTs in our setting is recommended.

Acknowledgements

This study was approved by the ethics committee of Tehran University of Medical Sciences (code number 9311286004).

References

1. Moritz S, Veckenstedt R, Bohn F, Hottenrott B, Scheu F, Randjbar S, et al. Complementary group Metacognitive Training (MCT) reduces delusional ideation in schizophrenia. Schizophr Res 2013;151(1-3):61-9.

2. Briki M, Monnin J, Haffen E, Sechter D, Favrod J, Netillard C, et al. Metacognitive training for schizophrenia: a multicentre randomised controlled trial. Schizophr Res 2014;157(1-3):99-106.

3. Moritz S, Vitzthum F, Randjbar S, Veckenstedt R, Woodward TS. Detecting and defusing cognitive traps: metacognitive intervention in schizophrenia. Curr Opin Psychiatry 2010;23(6):561-9.

4. Aghotor J, Pfueller U, Moritz S, Weisbrod M, Roesch-Ely D. Metacognitive training for patients with schizophrenia (MCT): feasibility and preliminary evidence for its efficacy. J Behav Ther Exp Psychiatry 2010;41(3):207-11.

5. Woodward TS, Balzan R, Menon M, Moritz S. Social cognition and metacognition in schizophrenia. 1st ed. Academic Press; 2014. Metacognitive training and therapy: an individualized and group intervention for psychosis; p. 179-93.

6. Kay SR, Fiszbein A, Opfer LA. The positive and negative syndrome scale (PANSS) for schizophrenia. Schizophr Bull 1987;13(2):261.

7. Haddock G, McCarron J, Tarrier N, Faragher E. Scales to measure dimensions of hallucinations and delusions: the psychotic symptom rating scales (PSYRATS). Psychol Med 1999;29(4):879-89.

8. Drake R, Haddock G, Tarrier N, Bentall R, Lewis S. The Psychotic Symptom Rating Scales (PSYRATS): their usefulness and properties in first episode psychosis. Schizophr Res 2007;89(1-3):119-22.

9. Heinrichs DW, Hanlon TE, Carpenter Jr WT. The quality of life scale: an instrument for rating the schizophrenic deficit syndrome. Schizophr Bull 1984;10(3):388-98.

10. Peters ER, Joseph SA, Garety PA. Measurement of delusional ideation in the normal population: introducing the PDI (Peters et al. Delusions Inventory). Schizophr Bull 1999;25(3):553-76.

11. Mirzaei Poueenak F, Ghanbari Pirkashani N, Nooripour R, Hosseini SR, Mazloomzadeh M, Shirkhani M. Psychometric validation of the Persian version of the community assessment of psychotic experiences-42 (CAPE-42) in Iranian college students. Psychosis 2022;14(1):81-92.

12. Birchwood M, Smith J, Drury V, Healy J, Macmillan F, Slade M. A self-report Insight Scale for psychosis: reliability, validity and sensitivity to change. Acta Psychiatr Scand 1994;89(1):62-7.

13. Moritz S, Woodward TS. Metacognitive training for schizophrenia patients (MCT): a pilot study on feasibility, treatment adherence, and subjective efficacy. German J Psychiatry 2007;10(3):69-78.

14. Jacobson NS, Truax P. Clinical significance: a statistical approach to defining meaningful change in psychotherapy research. J Consult Clin Psychol 1991 Feb;59(1):12-9.

15. Moritz S, Veckenstedt R, Bohn F, Hottenrott B, Scheu F, Randjbar S, et al. Complementary group Metacognitive Training (MCT) reduces delusional ideation in schizophrenia. Schizophr Res 2013;151(1):61-9.

16. Morrison AP, Pyle M, Chapman N, French P, Parker SK, Wells A. Metacognitive therapy in people with a schizophrenia spectrum diagnosis and medication resistant symptoms: a feasibility study. J Behav Ther Exp Psychiatry 2014;45(2):280-4.

17. Favrod J, Rexhaj S, Bardy S, Ferrari P, Hayoz C, Moritz S, et al. Sustained antipsychotic effect of metacognitive training in psychosis: a randomized-controlled study. Eur Psychiatry 2014;29(5):275-81.

18. Eichner C, Berna F. Acceptance and efficacy of metacognitive training (MCT) on positive symptoms and delusions in patients with schizophrenia: a meta-analysis taking into account important moderators. Schizophr Bull 2016;42(4):952-62.

19. Andreou C, Wittekind CE, Fieker M, Heitz U, Veckenstedt R, Bohn F, et al. Individualized metacognitive therapy for delusions: a randomized controlled rater-blind study. J Behav Ther Exp Psychiatry 2017;56:144-51.

20. Balzan RP, Galletly C. Metacognitive therapy (MCT+) in patients with psychosis not receiving antipsychotic medication: a case study. Front Psychol 2015;6:967.