

Original Article

The effectiveness of metacognitive therapy in patients with depression: Two years of follow-up

Zohreh Hashemi^{1*}, Majid Mahmood Alilu² and Touraj Hashemi³

1. Assistant Professor, Department of Psychology, School of humanities, University of Maragheh., Maragheh, Iran.
2. Professor , Department of Psychology, Faculty of Education and Psychology, University of Tabriz, Tabriz, Iran.
3. Professor in Psychology, Department of Psychology, Faculty of Education and Psychology, University of Tabriz, Iran.

Abstract

This study evaluated the effectiveness of metacognitive therapy (MCT) in the treatment of major depression. Rumination has attracted increasing interest in the past 15 years and research has demonstrated significant relationship between rumination, depression, and meta-cognition. MCT for depression is a formulation-driven treatment grounded in the Wells and Matthews' self-regulatory model. MCT focuses on reducing unhelpful cognitive processes and facilitates metacognitive modes of processing. MCT enables patients to interrupt rumination, reduce unhelpful self-monitoring tendencies, and establish more adaptive styles of responding to thoughts and feelings. MCT was evaluated in six-eight sessions of up to one hour each across three patients with major depressive disorder (MDD). A non-concurrent multiple-baseline with follow-up at one, six and 24 months was used. Patients were randomly allocated to different length baselines and outcomes were assessed via self-report and assessor ratings. Treatment was associated with large and clinically significant improvements in depressive symptoms, rumination and metacognitive beliefs; the gains were maintained over the follow-up

Keywords

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Introduction

Major Depressive Episodes (MDE) is defined in Diagnostic and Statistical Manual of mental disorders (DSM-IV-TR) as "a period of at least two weeks during which there is either depressed mood or the loss of interest or pleasure in nearly all activities". In addition, there must be at least four further symptoms from a list including changes in appetite or weight, insomnia or hypersomnia nearly every day, restlessness or being slowed down that can be observed by others, fatigue or loss of energy, feeling worthless or excessive guilt, diminished ability to think or indecisiveness, recurrent thoughts of death, or sociality. Symptoms must persist for most of the day, nearly every day for at least two consecutive weeks (American Psychiatric Association, 2000).

If untreated, MDE typically lasts six months or more. In most cases, there is complete remission, but in approximately 20–30% of cases some symptoms insufficient to meet full MDE criteria remain for months or even years. Individuals may experience repeated depressive episodes during their lifetime. Some episodes can become unremitting; they are classified as chronic when criteria for MDE has been met for at least the past two years. The metacognitive model and treatment of MDD is focused on understanding the causes of rumination and then removing this unhelpful process. Rumination is a key feature of the Cognitive Attentional Syndrome (CAS) activated in response to negative thoughts, sadness, and loss experiences. The CAS prolongs sadness and negative beliefs, leading to depressive episodes. MDD is characterized by one or

more major depressive episodes. Despite the success of Cognitive Behavioral Therapy (CBT) relative to other treatments, only approximately 40–58% of patients recover as assessed by the Beck Depression Inventory (Dimidjian et al., 2006; Dobson, Gollan, Gortner, & Jacobsen, 1998). Its long-term effectiveness requires improvement as only between one-third and one quarter of individuals receiving CBT remain recovered in 18 months (Roth & Fonagy, 1996). The high level of relapse has prompted some researchers to develop relapse prevention strategies as add-on techniques to CBT, as exemplified by mindfulness relapse prevention strategies (Teasdale et al., 2000). Preliminary indications are that for some individuals (those with more than three episodes of depression), such add-on strategies may reduce relapse rates (Teasdale et al., 2000). Of course, this does not address the problem of a modest initial response rate to CBT and other treatments, or the problem of managing more severe or treatment resistant cases (Wells & Matthews, 1994, 1996).

According to MCT, the maintenance of disturbance is linked to the activation of a particular style of thinking called CAS. This consists of repetitive thinking in the form of worry and rumination which is used as a means of coping with threat. It also consists of an attentional strategy of excessively focusing on sources of threat, which are often internal (e.g., thoughts, feelings). It includes coping behaviors (e.g., avoidance, thought suppression) that are unhelpful because they negatively influence the interpersonal environment and prevent the person from testing faulty beliefs. According to Wells and Matthews (1994), CAS is a product of metacognitive beliefs, and two sub-types are important: (1) positive beliefs about rumination and threat monitoring and (2) negative beliefs about the uncontrollability and significance of thoughts and feelings. Positive beliefs support CAS in response to stress and mood changes, and CAS in turn prolongs and deepens emotional disturbance. Furthermore, negative beliefs about the uncontrollability or threat of depressive experiences such as negative thinking patterns contribute to the persistence of rumination. In many cases the person lacks metacognitive awareness or appropriate knowledge to facilitate effective control. In such cases, a recurrent vicious cycle of ruminative responses occurs that the person is unable to terminate.

In summary, vulnerability to depression in the metacognitive model can be traced to the ease with which the patient activates the CAS in response to mood disturbances or stress. This in turn is linked to individual differences in metacognitive beliefs and the degree of flexible executive control over processing. Rumination appears to prolong and worsen negative emotional responses to stressful events (Nolen-Hoeksema &

Morrow, 1991; Larson, Nolen-Hoeksema, & Parker, 1994) and predict the onset of depression even when controlling high and low cognitive risk (Just & Alloy, 1997). Predictions of the metacognitive model have been empirically evaluated (see Wells 2000 for a review), and the goodness of fit of a clinical representation in depression tested (Papageorgiou & Wells, 2003).

Metacognitive profiling has demonstrated the presence of positive and negative beliefs about rumination in depressed patients (Papageorgiou & Wells, 2001). Furthermore, metacognitive belief domains correlate positively with depressive symptoms in non-patients and are elevated in depressed patient groups (Papageorgiou & Wells, 2001). The model is also supported by data from structural equation modeling in depressed individuals and non-patient samples (Papageorgiou & Wells, 2003). MCT is grounded in the metacognitive model and aims to modify the CAS and the psychological factors giving rise to it. In Wells and Matthews's (1994, 1996) Self-Regulatory Executive Function (S-REF) model of emotional disorders, perseverative processing is viewed as a coping strategy or a preferred means of appraisal that has several negative consequences for emotional self-regulation. For instance, worrying following stress appears to incubate intrusive images (Wells & Papageorgiou, 1995). Active and perseverative thinking, in the form of rumination or worry, is linked to positive and negative metacognitive beliefs about these processes (Cartwright-Hatton & Wells, 1997; Wells & Carter, 1999; Wells & Papageorgiou, 1998). This concept has been developed in a recent metacognitive model and treatment of generalized anxiety disorder (GAD) (Wells, 1995, 1997). To date, no studies have tested the prediction that positive and negative metacognitive beliefs about rumination are held by depressed individuals. Although several authors have previously linked rumination to the maintenance of depression (Nolen-Hoeksema & Morrow, 1991; Teasdale & Barnard, 1993), the nature of the knowledge base responsible for the selection of rumination as a coping strategy has not been considered outside of the S-REF model. In S-REF model, a particular CAS contributes to emotional dysfunction and to relapse following treatment. This syndrome occurs in the form of active and repetitive rumination or worry, and is characterized by chronic, intensified, inflexible self-focused attention, activation of maladaptive self-beliefs, diminished efficiency of cognitive functioning, attentional bias, and capacity limitations. The syndrome is generated by an interaction between levels of processing that in emotional disorders are concerned with the appraisal of self-relevant information. Processing is directed by metacognitive beliefs that contain knowledge that affects both the content of appraisals and the strategies used (e.g., rumination) by the individual. Sadness and depression

result from the appraised failure to meet self-regulatory goals specified by beliefs. These emotions become disordered when the individual's beliefs lead to execution of coping strategies typified by rumination and to negative self-relevant processing. Evidence of negative self-relevant processing in the metacognitive domain has been demonstrated in two recent studies of depressive rumination (Papageorgiou & Wells, 1999a, 1999b).

An important clinical implication of S-REF model is that modification of process and metacognitive dimensions may be beneficial in the treatment and prevention of recurrence of depression. According to Wells and Matthews (1994) "Patients should be encouraged to develop a higher metacognitive awareness and learn to process information in a way that does not trigger full-blown S-REF activity. This may be achieved by training in self-observation and attentional control which promotes detached mindfulness" (p. 311). A procedure advocated for this purpose is Attention Training Technique (ATT). Wells (1990) developed ATT with the aim of reducing self-focus and increasing attentional and metacognitive control, hence disrupting the activation of specific styles and dimensions of thinking associated with particular disorders and facilitating the development of new knowledge for directing processing. To date, several studies using established single-case methodology have demonstrated that ATT produces significant clinical improvements in self-report measures of affect, behavior, and cognition in panic disorder and social phobia (Wells, 1990; Wells, White, & Carter, 1997) and health anxiety (Papageorgiou & Wells, 1998). In the latter study, measures of self-focus indicated that ATT acted on attentional processes as intended.

Whilst these studies attest to the effectiveness of ATT in anxiety-based disorders, no study has examined the effects of formal attentional manipulations in the treatment of depression. This is the central objective of the present study. In a parallel line of work, Teasdale, Segal, and Williams (1995) have advocated the use of mindfulness meditation in the prevention of depressive relapse. Similarities appear to exist between ATT and mindfulness meditation, although several fundamental theoretical and practical differences are evident. First, mindfulness meditation derives from Buddhist practices while ATT is derived from the S-REF model, an information processing analysis of disorders of emotion. Second, while meditation is promoted as a strategy for the prevention of relapse following treatment of depression, ATT serves a dual function in both the treatment and the prevention of disorder. Third, some components of meditation encourage self-attention (e.g., focus on breathing), but ATT does not. Finally, the aim of ATT is to increase the flexible metacognitive control of attention and diminish "locked-in" self-focused processing. The aim

of meditation is principally to increase awareness of the here and now.

Method

Participants

Hypothesis of this research in the framework of single case experimental plan was evaluated on three patients with follow-up at one, three and six months by using multiple-baselines in six-eight sessions. Three patients were randomly assigned to predetermined baseline lengths of one-four weeks; in this case series the baseline lengths randomly selected were one, two, three, and four weeks. Following the baseline period, MCT was delivered weekly, with each treatment session lasting no more than one hour. After treatment, patients were followed up at one, three and six months, no additional treatment was delivered during the follow-up period.

Participants included in this study were the first four consecutively assessed individuals who met the following criteria: (1) primary diagnosis of a major depressive episode as determined by the Structured Clinical Interview for DSM-IV Axis I Disorders- Patient Edition (First et al., 1997), (2) aged 18–65, (3) absence of personality disorder, (4) not in receipt of concurrent psychological treatment, (5) no cognitive behavior therapy in the two years preceding referral, (6) no evidence of a psychotic or organic illness and/or a medical or physical condition underlying depression, (7) medication free or stable on medication for at least six months (8) not actively suicidal, (9) no current substance abuse. These criteria were determined via independent assessments conducted by Majid Mahmood Aliloo and Zohreh Hashemi. The main aim of single case research is to determine if there is a clear treatment effect following the introduction of the intervention. Accordingly, visual examination of graphed data provides a stringent test of the treatment effect as only unambiguous effects will be apparent (Parsonson & Baer, 1992). Therefore, session by session scores across baseline, treatment and follow-up on the BAI, BDI, RRS, MCQ, NBRS and PBRS are illustrated. In addition, pre-treatment (mean of baseline scores) post-treatment and follow-up scores on standardized measures for each of the three patients are presented in Table 1.

Patient one

Patient one was a 24-year-old single woman who reported that the current major depressive episode had lasted one year. She felt that she had experienced many depressive episodes since her early teenage years but was unable to estimate the number of prior episodes. In addition, she met criteria for gender identities. Her only previous contact with the psychiatric services was one-two

assessment sessions with a clinical psychologist.

Patient two

Patient two was a 22-year-old single woman who reported difficulties with depression since her late teenage years, being first treated for depression in seven years ago, without a suicide attempt and lasted 12 months. The current depressive episode had lasted for six months. No concurrent or past Axis I disorders were elicited and she didn't use any medicine during the treatment.

Patient three

Patient three was a 23-year-old single woman who described being first treated for depression in the past two years, without a suicide attempt for four months. The current depressive episode had lasted for five months and no concurrent or past Axis I disorders were elicited. She was a student at Tabriz University and she didn't use any medicine because she didn't like to use

Instrument

Beck Depression Inventory

The BDI is 21-item scale designed to assess an individual's current level of depression. Each of the 21-items is scored on a four-point scale with a maximum possible score of 63. The BDI is a reliable and well validated measure of depressive symptomatology, which is sensitive to treatment effects (Edwards et al., 1984). Beck Anxiety Inventory (BAI) (Beck et al., 1988).

BAI

The BAI is a 21-item self-report measure designed to reflect the severity of somatic and cognitive symptoms over the previous week. Items are scored on a four-point scale (0–3) with a total score derived by summing the endorsed rating of each item, giving a range of 0–63. The BAI has been shown to have excellent psychometric properties (Ruminative Response Scale (RRS), Nolen-Hoeksema & Morrow, 1991).

RRS

The RRS is a 22-item self-report inventory designed to assess the tendency to ruminate in response to a depressed mood. The items focus on the meaning of rumination and thinking about feelings related to depressed mood, symptoms, consequences and its causes. Items are scored on a four-point Likert scale from one (almost never) to four (almost always), and overall scores range from 22 to 88. It has high internal consistency, with Cronbach's alpha ranging from 0.88 to 0.92 (see Luminet, 2004, for a review), and a test-retest correlation of 0.67 over 12 months (Nolen-Hoeksema et al., 1999).

Positive Beliefs about Rumination Scale (PBRS)

The PBRS is a nine-item self-report scale that assesses positive metacognitive beliefs about rumination. Items tap beliefs such as "I need to ruminate about my problems in order to find answers to my depression". All items are scored on a four-point rating scale, ranging from one (do not agree) to four (agree very much). Scores range from 9 to 36, with higher scores indicating the conviction with which individuals hold positive metacognitive beliefs. This measure has high internal consistency with a Cronbach alpha of 0.89 and its convergent, discriminant, and concurrent validity have been demonstrated (Papageorgiou & Wells, 2001a, 2001b).

Negative Beliefs about Rumination Scale (NBRS)

The NBRS is a 13-item self-report inventory designed to assess negative metacognitive beliefs about rumination. Factor analysis of the NBRS revealed two factors. The first measures beliefs about the uncontrollability and harmful nature of rumination (NBRS1), for example; "Ruminating about my problems is uncontrollable". The second measures beliefs about the social and interpersonal consequences of ruminating (NBRS2), for example; "People will reject me if I ruminate". Respondents are asked to endorse the extent to which they believe each statement on a one-four scale (one = do not agree, four = agree very much). Total scores are derived by summing each of the items giving a range of 13–52. Preliminary validation of this measure indicates good internal consistency, test-retest reliability and convergent and concurrent validity. Cronbach alphas for NBRS1 and NBRS2 were 0.80 and 0.83 (Papageorgiou & Wells, 2001).

Metacognitions Questionnaire-30

The MCQ-30 is a self-report questionnaire that assesses a number of aspects of metacognition. It has five subscales (1) positive beliefs about worry, (2) negative beliefs about thoughts relating to uncontrollability and danger, (3) cognitive confidence, (4) beliefs about the need to control thoughts, and (5) cognitive self-consciousness (i.e., directing attention to one's thought processes). Each item is scored on a four-point Likert scale ranging from one (do not agree) to four (agree very much). Total scores range from 30 to 120, with subscale scores of 6–24. The MCQ-30 has good psychometric properties (Wells & Cartwright-Hatton, 2004). For purposes of this study, we were particularly interested in the cognitive self-consciousness subscale, as this can be viewed as an index of unhelpful monitoring of internal mental events (i.e., threat monitoring in depression). The Cronbach alpha for this subscale is reported to be 0.92 (Wells & Cartwright-Hatton, 2004).

Weekly Measure of Rumination

A self-rating scale was constructed to assess four dimensions of rumination; (1) time spent ruminating, (2) degree of life interference from rumination, (3) perceived levels of uncontrollability of rumination, (4) distress associated with rumination. All dimensions were rated for the past week on 0–100 scales. The psychometric properties of this instrument have not been evaluated (Wells et al., 2007).

Procedure

Patients referring to the clinic at Tabriz University for treatment of depression were invited to attend an assessment interview for possible participation in the current treatment study. All patients were assessed by Aliloo and Hashemi each administering the Structured Clinical Interview for DSM-IV (SCID) and checking for the study's inclusion/exclusion criteria. Agreement in diagnosis was found in all three cases and subsequently consent was obtained and all self-report measures were administered at this initial assessment. Weekly ratings were taken of the BDI, BAI and the weekly measure of rumination over the baseline period through the self-report questionnaires by researchers. During the treatment, the BAI, BDI, and weekly measure of rumination were completed at the beginning of each session. A complete set of questionnaires and interviewer-rated measures were administered at post-treatment, and at the one-, three- and six-month follow-up. The SCID was administered at pre-treatment, post-treatment and at follow-up by Hashemi. Treatment MCT consisted of six-eight weekly sessions of 45–60 minutes duration (total treatment time ranged from 4 to 7.5 hours). Within this range treatment was ended when therapist and patient agreed. Treatment followed the treatment as set out in treatment manual (see Wells, 2008) which acted as the main session by session manual. In the first treatment session, an idiosyncratic case formulation based on the metacognitive model of depression was presented to each patient. Socialization to the model followed, which emphasized how rumination and a high level of self-focus (focusing on negative thoughts and feelings) maintain depression. At the end of the first treatment session, ATT was introduced as a method of counteracting excessive self-focus and to help the patients switch to a metacognitive mode of processing. ATT is an auditory attention task and consists of three stages, selective attention, attention switching and divided attention. The task takes approximately 10 minutes and once practiced in session, patients were asked to implement ATT daily as a homework assignment. In-session practice of ATT was given throughout the treatment. In the next three sessions, treatment focused on careful identification of rumination and modifying

positive and negative beliefs about it. Verbal reattribution strategies were used to modify negative beliefs concerning the uncontrollable nature of rumination. This was followed by training patients in 'detached mindfulness' (Wells & Matthews, 1994; Wells, 2005) coupled with rumination postponement experiments which challenge the belief that rumination is uncontrollable. Patients are asked whether they have ever chosen to notice their negative thoughts and not engage with them.

In this context, engagement means rumination, analysis of the thought, cognitive avoidance or any form of further processing of the thought. Several strategies are used in session to clearly convey the concept of 'Detached Mindfulness'. One strategy is a free-association task in which the therapist reads aloud a series of everyday words and asks the patient to passively observe what happens in their mind. Subsequently, patients were encouraged to use detached mindfulness in response to negative thoughts that previously trigger rumination. Patients may still be motivated to use rumination as a coping strategy if positive beliefs about rumination remain. To counteract positive beliefs, an analysis of the advantages and disadvantages of rumination was undertaken to demonstrate that rumination maintains depression and is not an effective method of coping. The final two treatment sessions focused on relapse prevention and further modification of positive and negative metacognitive beliefs which included erroneous beliefs about the recurrence of emotion and deviations in mood. Relapse prevention involved the development of a therapy-blueprint which includes a written and diagrammatic formulation of the metacognitive model of depression. A detailed account of the main therapeutic strategies used during treatment was also provided, along with a specific plan for the patient to implement in guiding their thinking and behavioral style in responses to future negative moods. Patients were encouraged to implement these strategies to maintain and strengthen the gains made over the course of treatment.

Results

Figure 1 shows patients' BDI and BAI scores during baseline, post-treatment and at follow-up. Two patients showed stability in BDI and BAI across the baseline phase and, as Fig. 1 illustrates, patient three showed a single decrease in BDI and BAI at end of the baseline. However, all patients achieved clinically significant improvements on depression and anxiety measures. MCT effects were maintained at follow-up. Re-administration of the SCID at the six months follow-up assessment revealed that none of the patients met DSM-IV criteria for major depressive disorder, thus suggesting some stability in the efficacy of MCT. Each patient pre-treatment, post-treatment and

follow-up scores on the RRS, PBRs, NBRS and MCQ are presented in Fig. 2.

Table 1. Descriptive statistics on the main outcome measures across the three cases at pre-treatment, post-treatment and follow-up

GROUP	Mean	Std. Deviation
BDI		
pre-treatment	23/1	2/6
Post-treatment	12/4	5/6
1 month follow-up	6	3
6 month follow-up	6/3	3/5
24 month follow-up	2/6	1/1
BAI		
pre-treatment	18/6	2/2
Post-treatment	10	2/9
1 month follow-up	7/3	5/8
6 month follow-up	7/3	2/5
24 month follow-up	7/3	2/08
RRS		
pre-treatment	36/2	9/7
Post-treatment	17/3	9
1 month follow-up	10	8/7
6 month follow-up	10/3	6/6
24 month follow-up	15	5/5
MCQ		
pre-treatment	81/7	9/56
Post-treatment	54/5	14/4
1 month follow-up	45/6	1/15
6 month follow-up	51/6	1/52
24 month follow-up	46/6	5/50
NBRS		
pre-treatment	39/8	9/07
Post-treatment	31/3	11/09
1 month follow-up	21/6	3/7
6 month follow-up	30	5
24 month follow-up	20	7/2
PBRs pre-treatment		
Post-treatment	22	8/17
1 month follow-up	21	6/5
6 month follow-up	17/6	2/5
24 month follow-up	15/3	2/5

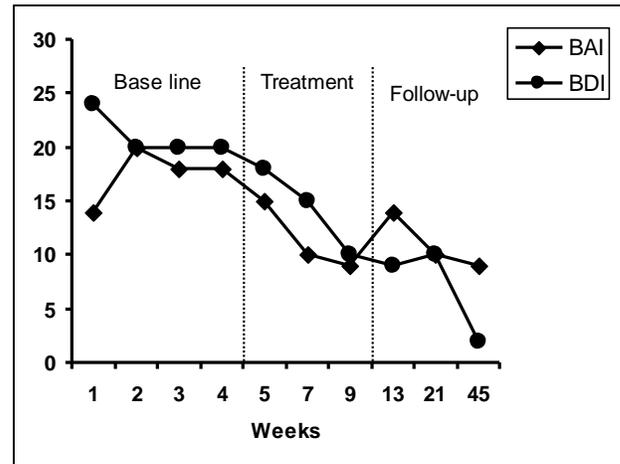


Fig.1 patients' BDI and BAI scores at pre-treatment, post-treatment and follow-up

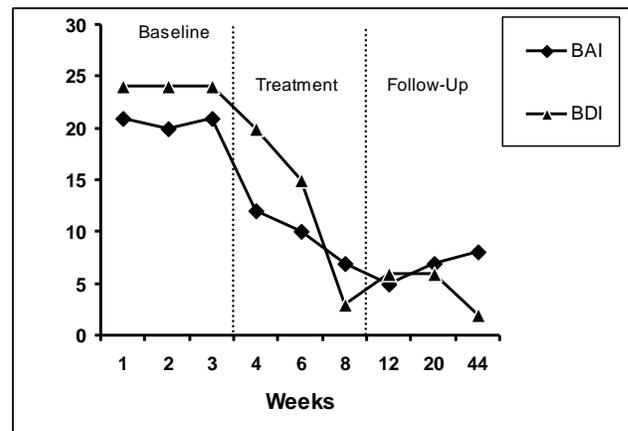


Fig. 2 Scores on measures at pre-treatment, post-treatment and follow-up for each patient

In each case, post-treatment and follow-up scores were substantially lower than pre-treatment on all measures. These data are consistent with effects of MCT on underlying thinking style adding support to finding from the weekly rating of rumination. In addition, these changes support the effects of treatment on metacognitions. Both positive and negative metacognitive beliefs decreased substantially during treatment. This result is consistent with the hypothesized effect of MCT on underlying metacognitive and process-related variables, also this result is consistent with the results of (Wells et al., 2007). In each case, treatment gains appear to be maintained across the post treatment follow-up interval but change in co-morbid axis disorder in patient one was not assessed.

Discussion

The results of this study are encouraging and suggest that MCT might be an effective brief treatment for depression, as it was mentioned earlier, CBT is a recommended treatment for depression with a large number of clinical trials supporting its efficacy (Butler et al., 2006; Derbies & Christoph, 1998; National Institute of Clinical Excellence, 2004). In spite of CBT methods being useful in controlling or at least reducing depression, there are still defecations in these methods.

Although judging the degree of effectiveness and usefulness of different methods of therapy in the framework of cognitive sample is still too soon; however, it seems MCT for depression according to its focus on mutual relationship of rumination and metacognition (especially positive and negative beliefs about ruminations) is in better cognition than other theoretical models. Wells as the most famous person in this scope proposed that we should try to change the mental rumination and metacognitive beliefs directly, especially negative and positive beliefs about rumination. As it was observed in the part of results of this research, MCT was performed on three cases in the framework of a single case experimental plan and during it, mental rumination, positive beliefs about rumination and negative beliefs about rumination were challenged and created meaningful changes in all variables in each of three cases. In the framework of Well's MCT, it can be understood that changes in depressed and anxious mood are because of changes in mental ruminations and beliefs related to them and because of the current research, on the one hand, mental ruminations, positive and negative beliefs and attention treatment techniques, on the other hand, formed the main aim of intervention while depressed mood was not the main aim of the therapy, it can be supposed that changes in cases were done after changes in ruminations.

From one point of view, the follow-up study that was done in period of one, three and six months, showed that the created therapy benefits were kept and this can be taken into consideration as document for considerable successes of depression MCT. Overall, the treatment was well-tolerated and none of the patients reported a worsening of symptoms or distress during the course of treatment. In addition, the treatment was short and could be delivered in six-eight sessions. Therefore, it can be said that the results of this study are harmonious with Well's findings and others, showing the best position of intervention in depression therapy are mental rumination and positive and negative beliefs about it and in the result of ruminations reduction, depressed mood can be reduced in the very considerable amount. Despite the encouraging results, this study is based on only three cases which

limits inferences about the generalizability of treatment effects. Whilst the multiple baseline design controls for effects such as time, we are unable to partial-out the effects specifically due to metacognitive treatment techniques as opposed to non-specific factors. Patients did not have therapist contact during the baseline and so we cannot determine the extent to which results reflect the efficacy of treatment or this non-specific factor. The use of only one therapist means that it is not possible to determine the influence of therapist factors such as skill level. Whilst adherence to treatment was monitored throughout supervision, there was no formal assessment of adherence to the treatment manual which is a limitation of the present case-series. The assessor was not blind to the presence or absence of treatment which may have influenced the assessor ratings. Finally, we do not know the impact that therapist expectations might have had on rumination measures as the measures have not been validated in this regard. Despite these limitations, consistent with the strategy of targeting treatment more specifically on maintaining processes as implicated in the metacognitive model, MCT was associated with substantial improvements in depression symptoms measured by self-report and assessor ratings. Moreover, these effects occurred in a short period of time. MCT appears to produce changes in underlying causal mechanisms and processes that are important in the model from which it is derived. In view of these encouraging results larger studies and controlled evaluations of the potential effects of MCT in single episode and more complex depression are clearly indicated.

Conclusion

Physicians usually encounter a set of cognitive challenges and problems while dealing with epilepsy, and the issue of cognitive disorder in patients with epilepsy is still a challenging issue for them. Poor control and increasing frequency of seizures in patients with DRE are often accompanied by a greater reduction in cognitive function. Determining cognitive dimensions in patients with DRE allows physicians to make use of more effective and comprehensive treatment strategies to better manage their disorders. Therefore, it is necessary to take into consideration all clinical factors of epilepsy when studying the neuropsychological function of patients with epilepsy so that success can be achieved in the selection of an effective cognitive rehabilitation treatment strategy and surgery.

Further studies are required to reach a more definitive conclusion. Among the limitations of this research are the available sampling and self-reporting of the studied variables. Therefore, it is suggested using other methods such as interviews and to study the sample size in the age range in order to be able to generalize the results. It is also

suggested to evaluate the effectiveness of this method in comparison with other methods.

Conflict of interest

The authors of this article declare that there was no conflict of interest.

ORCID

Zohreh Hashemi <http://orcid.org/0000-0002-9830-6993>

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