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# Effectiveness of Metacognitive Therapy on Metacognitive Beliefs and Selective Attention of Individuals with Depressive Disorders

Farzaneh Maschi
Islamic Azad University, Khorasgan Branch, Isfahan, Iran

Mohsen Karimi✉
Baqiyatallah University of Medical Sciences, Tehran, Iran

The present study aimed at evaluating the effectiveness of metacognitive therapy in improving metacognitive beliefs and selective attention of people with depressive disorders in Tehran. Present study was a clinical trial with a pretest-posttest design and a control group. The statistical population consisted of all the female students of the universities of Tehran who were diagnosed with depression in 2019. Out of the volunteers, 30 individuals diagnosed with depression were selected and randomly assigned into either the experimental ($n$ = 15) or the control group ($n$ = 15). 8 sessions of metacognitive therapy was applied for the experimental group while the control group stayed on waitlist. Both groups were assessed in pretest and post-test occasions. Beck depression inventory, metacognition questionnaire, and a clinical interview based on DSM-5 were administered. Data analysis was conducted by using multivariate analysis of covariance using IBM SPSS 26. Univariate ANCOVA results of experimental group demonstrated a statistically significant decrease in metacognitive beliefs while simultaneously showing significant increase in the selective attention compared to control group. It can be concluded that metacognitive therapy can improve selective attention and decrease metacognitive beliefs and therefore it can decrease the severity of depression in participants.

*Keywords:* Metacognitive Therapy, Metacognitive Beliefs, Executive Functions, Depression

The diagnostic category of mood disorders in the new DSM-5 is divided into two separate categories: bipolar and related disorders, and depressive disorders. Depressive disorders consist of disorders such as disruptive mood dysregulation disorder, single episode major depressive disorder, recurrent major depressive disorder and dysthymia (APA, 2013). Individuals diagnosed with depressive disorders may experience a variety of dysregulations in their cognitive, behavioral and emotional functioning.

Among the abilities that are likely to be impaired in individuals with depression are executive functions. The term ‘executive functions’ refers to a wide range of cognitive and metacognitive processes such as planning, systematic search, impulse control, behavioral self-regulation, the use of flexible strategies, selective attention, attention control, and self-evaluation (Wells, 2009). Research results demonstrate the existence of cognitive deficits, especially in the executive functions of individuals with depression (Karimi Aliabad, Kafi, Farrahi, 2010; Afshari, Khezrian, Faghihi, 2019; Ryan, Vederman, McFadden, Weldon, Kamali, Langenecker, 2012; Afshari, Zanjani, 2018; Drakopoulos, Sparding, Clements, Palsson, Landén, 2020; Porter, Bourke, Gallagher, 2007; Austin, Mitchell, Goodwin, 2001;

✉ Correspondence should be addressed to Mohsen Karimi, MSc in Clinical Psychology, Department of Clinical Psychology, Baqiyatallah University of Medical Sciences, Tehran, Iran; Email: Karimi.psy@yahoo.com

Bishop, Lau, Shapiro, Carlson, Anderson, Carmody, Segal et. al, 2004).

Since attention provides a basis for all other cognitive functions and is considered as a gateway for information to the brain (Kellough, Beevers, Ellis, Wells, 2008), it has been of particular importance among executive functions. The concept of attention is defined as the clear focus of the mind on one or more objects, or a chain of simultaneous stimuli. Selective attention designates the ability to select prominent information for complementary cognitive processing (Callesen, Reeves, Heal, Wells, 2020). In terms of attention, individuals with depression are more likely to selectively pay attention to negative stimuli and, conversely, they pay less attention to positive ones. Such biases are rotationally involved in the maintenance of depression (Keller, Leikauf, Holt-Gosselin, Staveland, Williams, 2019). In this regard, in the study of executive functions in individuals with depression, it was revealed that individuals with depression are different from normal individuals in terms of inhibition, attention shifting and updating working memory (Kheirabadi, Yousefian, Zargar, Bahrami, Maracy, 2020; Mehrabizadeh Honarmand, Abafat, Hashemi, Bassak Nejad, 2017; Nordahl, Halvorsen, Hjemdal, Ternava, Wells, 2018).

Etiology of depression assumes that various factors can affect the condition including biological, hereditary, psychological and social factors. Accordingly, different treatment methods have been proposed based on different etiological theories. Since depression causes numerous problems for the affected individuals, the need to develop innovative and evidence-based treatments capable of reducing the symptoms is felt more than ever. Among different treatments designed to date, those that can improve executive functions in people with depression have a special position. Executive functions are closely related to metacognition, hence responding well to metacognitive therapy (Wells, 2009). Over the last two decades, with the growth of metacognitive therapy (MCT), a wide range of disorders has been covered by this treatment (Wells, 2009).

The specific metacognitive therapy implemented in this study was the Wells' metacognitive model. This therapeutic approach has been successful in understanding the etiology and the treatment of different disorders such as generalized anxiety disorder (Melchior, Franken, Deen, van der Heiden, 2019), post-traumatic stress disorder (Pinjarkar, Sudhir, Math, 2015), obsessive-compulsive disorder (Winter, Gottschalk, Nielsen, Wells, Schweiger, Kahl, 2019), social anxiety (Wells, Matthews, 1996), and depression (Normann, van Emmerik, Morina, 2014). Wells' metacognitive model based on the theory of self-regulatory executive functions (S-REF) proposed by Wells and Matthews (1996) and was first successfully applied for generalized anxiety disorder and then developed as a general therapeutic approach (Beck, Steer, 1984).

Wells' model assumes that people with depression engage in anxiety and rumination. In metacognitive therapy, defective metacognitive beliefs are considered as the main characteristics of the individuals with depression. Wells believes that in the metacognitive model of depression, the cycle of these beliefs should be targeted (Beck, Steer, 1984). The overall goal of the treatment is for participants to learn not to engage in and respond to negative thoughts and to deal with their external and current lives (Hamid, 2011).

Previous research has evaluated MCT on a number of disorders (Mehrabizadeh Honarmand, Abafat, Hashemi, Bassak Nejad, 2017; Nordahl, Halvorsen, Hjemdal, Ternava, Wells, 2018; Melchior, Franken, Deen, van der Heiden, 2019; Pinjarkar, Sudhir, Math, 2015). However, these studies have placed less emphasis on executive functions such as selective attention. A meta-analytic review of the effectiveness of metacognitive therapy for a diversity of disorders found that MCT is highly effective in reducing symptoms of different disorders including depression (Winter, Gottschalk, Nielsen, Wells, Schweiger, Kahl, 2019). To the best knowledge of the researchers, no study has been so far reported on the effectiveness of metacognitive therapy in reducing executive functions deficits in people with depression. Therefore, this study sought to answer the question as to whether metacognitive therapy was effective in improving metacognitive beliefs and attention of people with depression.

## Method

This was a clinical trial with a pretest-posttest and a control group design.

## Participants

The statistical population consisted of all female college students in Tehran in 2019. Participants consisted of 30 female college students diagnosed with depression selected through in person interviews.

## Procedures

Female students, who reported experiencing symptoms of depression over phone calls were selected and then invited to an in person examination in which 30 of them who were diagnosed with depression and signed the informed consent forms, were selected as participants. Inclusion criteria were being single (not married), aged between 18-33 years, and exclusion criteria were suffering from hypothyroidism, diagnosed with a psychotic disorder, and diagnosed with drug dependency. 30 participants whose scores in Beck depression inventory (BDI) were equal to or greater than 13 and were diagnosed with depression based on an interview according to DSM-5 criteria were randomly assigned to either the experimental ($n$ = 15) or the control group ($n$ = 15).

In order to comply with ethical principles, all participants signed informed consent forms in which they were assured that their information would remain confidential. Moreover, they were free to discontinue participating in the research at any stage of the study. Further, after post-test measurements, four 90-minute treatment sessions were administered for control group. The intervention was performed according to Wells' metacognitive therapy manual for depression. It should be noted that the treatment was administered by a metacognitive therapy expert. Intervention consisted of 8 one and a half hour sessions of metacognitive therapy administered once a week. Immediately after the end of the treatment sessions, post-tests were administered to both groups.

## Measurement Instruments

*A Demographic Questionnaire.* This questionnaire examine the participants' personal status in terms of age, marriage, education level, employment, and their previous referrals to a psychiatrist or a psychologist maybe for mental health problems and the medications they may use.

*Clinical Interviews*. The diagnoses of depression were approved by diagnostic interviews carried out by the therapists. Structured diagnostic interviews were performed by the therapists with all the participants based on DSM-V criteria.

*Beck Depression Inventory (BDI)*. BDI (Beck, Steer, 1984) is a questionnaire that consists of 21 multi-choice items that assesses the symptoms of depression in three subscales each containing seven items including emotional symptoms, motivational and cognitive symptoms, and physical and plant symptoms. All questions are scored based on a Likert scale (0-3) and the individual's total score can be in the range of 0-63 by summing up the scores for all the questions. Many psychometric studies have been carried out in Iran to assess the content validity, construct validity and discriminant validity BDI and there have been factor analysis studies have generally had good to excellent results (Hamid, 2011). For example, the internal consistency of BDI by using Cronbach's alpha method was found to be 0.84 and the correlation coefficient obtained by split-half method based on even and odd questions was found to be 0.70 (Khatibian, Shakerian, 2014).

*Metacognition Questionnaire (MCQ).* MCQ is a 30-item questionnaire designed to measure the dimensions of metacognitive beliefs. It has been obtained from the original long form of metacognition questionnaire with 65 items (Cartwright-Hatton, Wells, 1997). Both the long form and the short form of the metacognition questionnaire have obtained acceptable validity and reliability (alpha coefficient ranged between 0.72 and 0.89 for the long form and total Cronbach's alpha of 0.93 for the short form) in adult population. MCQ measures 5 subscales of beliefs associated with thinking and thought processes (especially worry and intrusive thoughts). The participants are asked to report their agreement with each item on a 4-point Likert scale, ranging from "strongly disagree" to "strongly agree". Cartwright-Hatton et al. (1997) reported a Cronbach's alpha coefficient of 0.91 for the overall factor and 0.66 to 0.88 for the subscales (Myers, Solem, Wells, 2019). The results of test-retest reliability with a two-week interval in this study showed reliability coefficients ranging between 0.24 and 0.90 for the subscales and 0.34 for the total factor ($p$ =.017). Shirinzadeh-Dastgiri (2006) reported the MCQ's internal consistency

using Cronbach's alpha method to be 0.91 for the overall scale and 0.71 to 0.87 for subscales and the test-retest reliability with a four-week interval to be 0.73 for the overall scale and 0.59 to 0.83 for the subscales. Additionally, the correlation of the total scale with the Trait Anxiety Inventory was 0.43 and correlation of the subscales ranged from 0.28 to 0.68. The correlation between MCQ subscales and its total score ranged from 0.58 to 0.87 and the correlation between subscales ranged between 0.26 to 0.62 (Myers, Solem, Wells, 2019).

*Stroop Color and Word Test (SCWT)*. SCWT is among the most widely used tests for selective or focused attention as well as the response inhibition (Stroop, 1935), and is a laboratory model and a basic test for the function of the frontal lobe of the brain, which was first developed by John Ridley Stroop (1935); this is why it was called the Stroop effect. In the present study, a computerized version of SCWT was used, which consisted of three stages. The indicators measured in this test were: accuracy (number of correct responses), speed (average reaction time of correct responses to the stimulus measured in milliseconds). The reliability coefficients of Stroop test, based on the research by Otello and Graf in 1995, were 0.01, 0.83 and 0.90, respectively, for all three attempts, through the test-retest method. Qadiri, Jazayeri, Ashayeri and Qazi Tabatabaei (2006) reported the reliability coefficients of all the three attempts of this test to be 0.6, 0.83 and 0.97, respectively.

**Data Analysis**

Multivariate analysis of covariance (MANCOVA) by using IBM SPSS 26 was used to analyze the data with 8 inter-correlated subscales as dependent variables and Bonferroni correction to prevent the alpha inflation error. Pretest scores were set as covariates in the analyses to control for the initial differences of the participants.

## Results

The results of multivariate tests including Pillai's trace and Wilks Lambda showed a statistical significant effect of group membership on the linear composite of the dependent variables even after controlling for the initial differences (as it mentioned earlier pretest scores were set as covariate variables) ($F_{(5,\ 17)} = 14.57$; $p = 0.001$; Pillai's trace = 0.811; Wilks lambda = 0.189; partial eta squared = 0.81). Univariate ANCOVA's with Bonferroni corrections showed that all the differences between experimental and control groups were statistically significant even after controlling for the initial differences among the participants (all $p's \leq 0.01$) with effect sizes ranged between .329 to .727 (see Table 1 below).

**Table 1**

Descriptive Statistics and Univariate ANCOVA Tests with Bonferroni Corrections

| | Experimental Group | | Control Group | | Univariate ANCOVA | | |
|---|---|---|---|---|---|---|---|
| Dependent List | Pre-Test Mean (SD) | Post-Test Mean (SD) | Pre-Test Mean (SD) | Post-Test Mean (SD) | F | P | ES |
| Positive beliefs | 18.76 (1.42) | 12.69 (3.22) | 17.80 (1.7) | 18.86 (1.88) | 14.30 | 0.001 | 0.405 |
| Negative beliefs | 19.31 (1.5) | 13.69 (1.65) | 19.13 (1.5) | 18.46 (1.06) | 46.72 | 0.001 | 0.69 |
| Cog confidence | 19.84 (1.67) | 11.92 (2.32) | 20.80 (1.42) | 19.80 (1.78) | 55.92 | 0.001 | 0.727 |
| Superstitions, Punishment, etc. | 18.15 (1.34) | 14.69 (2.17) | 19.86 (2.61) | 19.60 (2.69) | 14.95 | 0.001 | 0.416 |
| Cog self-consc | 23.69 (2.09) | 17.38 (2.27) | 21.73 (2.91) | 22.33 (2.58) | 10.29 | 0.004 | 0.329 |
| Total Meta-cog | 98.69 (6.37) | 70.38 (7.07) | 99.33 (8.02) | 99.06 (4.75) | | | |
| Stroop Correct | 13.84 (0.98) | 13.66 (1.11) | 13.46 (1.12) | 17.06 (1.32) | 53.49 | 0.01 | 0.68 |
| Stroop RT | 2.39 (0.36) | 1.13 (0.19) | 2.47 (0.35) | 2.24 (0.45) | 67.26 | 0.001 | 0.72 |

## Discussion

Present study investigated the effectiveness of metacognitive therapy in improving metacognitive beliefs and selective attention in female participants diagnosed with depression. After receiving metacognitive therapy intervention, the experimental group showed a significant decrease in positive metacognitive beliefs scores in the post-test compared to the control group. These results were consistent with the results obtained by Barnhofer, Crane, Hargus, Amarasinghe, Winder, Williams (2009) and Wells and Wolford (2008) who were successful in improving depression symptoms by using a comprehensive metacognitive therapy plan.

Bergerson et al. (2010), similarly, used metacognitive therapy in their study to reduce the depression symptoms in their participants. In a study by Jordan et al. (2014), a well-established randomized-controlled trial, 48 participants diagnosed with depression underwent metacognitive and cognitive-behavioral therapies. The results demonstrated that both treatments were effective in reducing participants' symptoms. Comparison of the two treatments also revealed that there were no significant differences between the two methods, but pairwise comparisons indicated that metacognitive therapy showed greater effects in a group with comorbid disorders.

The results of a clinical trial by Dorman et al. (2015) on 11 participants diagnosed with depression in Denmark which performed ten 90-minute treatment sessions, revealed that metacognitive therapy was also effective in improving the comorbid disorders (Hagen, Hjemdal, Solem, Kennair, Nordahl, Fisher et. al, 2017). As an explanation research has shown that depression is associated with rumination and positive and negative metacognitions. When the treatment is focused on therapeutic components like reducing rumination and improving metacognitions, it can decrease the symptoms of depression (Winter et. al, 2019) and this is precisely the same strategy used by Wells' metacognitive therapy model (Bonhoeffer, et al., 2009).

Metacognitive therapy, on the other hand, alters processes and activities such as rumination, threat monitoring, focus on risk, suppression of thoughts, and behaviors like behavioral, cognitive and emotional avoidance that individuals with depression choose to cope with (Norman et al., 2014).

In explaining the effect of metacognitive therapy, Papagiorgio and Wells (2004) argue that metacognitive therapy should be a prelude to cognitive therapy, in which negative and positive beliefs about rumination are challenged. Then, the individual should be trained, through attention exercises, to stop rumination, followed by conventional cognitive therapies. In an experimental study, they demonstrated that by reducing rumination, positive and negative metacognitive beliefs can be effective in treating depression (Wells, Papageorgiou, 2004). Wells (2006) also emphasizes that as long as rumination is not directly challenged and metacognitive beliefs related to them and in particular negative and positive metacognitive beliefs are not changed, depression treatment will not be effective (Wells, 2009). Wells (2009) believes that this therapeutic method paves the way for the normal processing pathway that is disrupted in most mental disorders by eliminating worry and rumination and creating a flexible metacognitive method (Moin Al-Ghorabaiee, Karamloo, Noferesti, 2017).

In this respect, the research results suggest that metacognitive therapy focuses on attentional processes such as attentional bias, cognitive control, and unstable limitations in processing, and reducing rumination as well as positive and negative metacognitive beliefs which all of them may lead to improvement in depression symptoms (Winter et al., 2019).

### Strengths and Limitations

This study demonstrated the effectiveness of metacognitive therapy in reducing metacognitive beliefs and improving selective attention in female participants with depression in Iran. Like any other research, this study also contained some limitations including: the study was limited to outpatient, female participants with depression in Tehran, which in turn affects the generalizability of the research findings; thus, caution should be exercised in extending these findings to other samples. The sample of this study was comprised of outpatients and did not include hospitalized individuals with severe depression; therefore, caution should be

taken in generalizing the results to individuals with severe and persistent depressive disorders.

**Author Note:**

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**Statements:**

There is no conflict of interest. This study was approved by the scientific and ethical committee of Baqiyatallah University of medical sciences. All the participants read and approved the informed consent forms.

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