The Effects of Meta-Cognitive and Cognitive-Behavioral Therapies on Anxious Thoughts and Meta-Cognitive Beliefs of Students with Generalized Anxiety Disorder

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The aim of the present research was to determine the effects of meta-cognitive and cognitive-behavior therapies on anxious thoughts and meta-cognitive beliefs of the students with generalized anxiety disorder. The sample consisted of 60 participants randomly selected from the high school male students with generalized anxiety disorder in Massal city, and were assigned randomly to two experimental and one control groups. To collect data the Meta-cognition Questionnaire and the Anxious Thoughts Inventory were used. Data were analyzed using covariance analysis. The results showed that significant differences exist between the experimental groups and the control group in the variables of meta-cognitive beliefs and anxious thoughts. Multi-comparison tests revealed that meta-cognitive therapy was more effective in modifying the dysfunctional meta-cognitive beliefs and decreasing the anxious thoughts than the cognitive-behavior therapy. Results provided support for the more effective role of meta-cognitive therapy in decreasing anxiety and modifying the dysfunctional meta-cognitive beliefs.

Keywords: cognitive-behavior therapy, meta-cognitive therapy, meta-cognitive beliefs, generalized anxiety disorder

Generalized anxiety disorder (GAD) is a pervasive disorder (Wittchen, 2002) that is characterized by excessive anxiety and uncontrollable worry (APA, 2000). GAD is a prevalent and chronic disorder with high rates of recurrence; its point prevalence is 1.5-3% and its lifetime prevalence is 4-7% (Kessler & Wittchen, 2002). GAD is one of the most frequently occurring psychological disorders (Lieb, Becker, & Altamura, 2005). GAD has been shown to lead to significant functional impairment, which is at least comparable to that of patients suffering from other prevalent psychological disorders (Lieb et al., 2005; Wittchen, Beesdo, & Kessler, 2002).

GAD appears moderately responsive to cognitive behavioral treatments (e.g. Durham & Allan, 1993). In a meta-analysis of data from six CBT outcome studies, Fisher and Durham (1999) reported a recovery rate across all treatments of 40%, overall based on trait-anxiety scores (Speilberger, Gorsuch, Lushene, Vagg, & Jacobs, 1983). Two treatments, i.e., applied relaxation and individual cognitive behavior therapy (CBT), did best with recovery rates of 17–59% for applied relaxation and 26–71% for CBT at post-treatment. At 6-month follow-up one particular study (Borkovec & Costello, 1993) obtained a recovery rate of 81% for applied relaxation.

In two other studies, applied relaxation appeared less effective (Arntz, 2003). Ost and Brietholt (2000) obtained little improvements in trait anxiety following applied relaxation. Arntz (2003) reported that 35% of cognitive therapy patients and 44.4% of applied relaxation patients were recovered. At 6-month follow-up this had increased to 55% for cognitive therapy patients and 53.3% for applied relaxation patients on the basis of the trait-anxiety.

These data show that the outcomes of applied relaxation and CBT are considerably variable, and there is a need for more effective treatments. Recent attempts to improve treatment have combined these treatment elements, and increased the amount of therapy delivered (e.g. Borkovec,

Newman, Pincus, & Lytle, 2002; Durham et al., 2004). However, so far treatment outcomes have not improved. Progress might be made by basing treatment on a model of the mechanisms and factors underlying pathological worry, the hallmark of this disorder.

The meta-cognitive model of GAD (Wells, 1995, 1997) is based on the principle that meta-cognitive beliefs, meta-cognitive appraisals, and thought control strategies are central factors in the development and persistence of the disorder. The model (Wells, 1995, 1997) asserts that individuals with GAD, like most people, hold positive beliefs about worrying as an effective means of dealing with threat. However, worry is used as an inflexible means of coping with threats, and this becomes a problem when negative beliefs concerning the uncontrollability and the dangers of worrying develop, leading to unhelpful control strategies (Wells & King, 2006).

In this model two broad subtypes of worry are distinguished: type 1 and type 2. Type 1 refers to worry about external events and physical symptoms, and can be distinguished from type 2, which concerns negative appraisals of worrying. Essentially type 2 worry is worry about worrying. In the model worrying is used as a means of coping with threat. It persists until either the individual achieves an internal/external signal signifying that it is safe to stop worrying, or the person is distracted from the activity. During the development of GAD, negative appraisals of worrying and associated negative beliefs develop. Two domains of negative beliefs/appraisals are important: (1) the uncontrollability of worrying, and (2) its dangerous consequences for physical, psychological, and social functioning. When negative meta-cognitions of this kind develop, the person experiences an elevation in distress and worry. The co-existence of positive and negative beliefs about worrying lead to unhelpful vacillation in attempts to avoid or engage in worry, and the use of unhelpful mental regulation strategies such as reassurance seeking and thought suppression. Such strategies, when they are successful, prevent the person from discovering that worrying does not lead to catastrophe. Some strategies do

not work and reinforce beliefs which are out of control. For example, attempting to suppress thoughts that trigger worry can backfire and increase preoccupation with these thoughts. Strategies such as seeking reassurance do not allow the person to unambiguously discover that worrying can be controlled by the self. It follows from this model that successful treatment of GAD should focus on modifying several meta-cognitive factors, including counterproductive thought control strategies, erroneous beliefs about the uncontrollability of worry, negative beliefs about the danger of worrying, and positive beliefs that support the overreliance on worrying as a coping strategy (Wells & King, 2006).

Meta-cognitive therapy (MCT) has been pilot tested for OCD in a case series (Fisher & Wells, 2008) as a component of small group treatment (Rees & Van Koesveld, 2008). According to some larger studies it seems that meta-cognitive therapy is an effective intervention for OCD (Wells, 2000; Fisher, 2009). Also, Studies have successfully applied the meta-cognitive model to the treatment of post-traumatic stress disorder (Wells & Sembi, 2004; Wells, 2008), depression (Wells, Fisher, Myers, Wheatley, Patel, & Brewin, 2012) body dysmorphic disorder (Rabiei, Mulkens, Kalantari, Molavi & Bahrami, 2012), and schizophrenia (Aghotor, Pfuelle, Moritz, Weisbrod & Roesch-Ely, 2010; Moritz, et al. 2011).

Wells & King (2006) assessed ten consecutive patients fulfilling DSM-IV criteria for GAD before and after MCT, and at 6- and 12-month follow-up. Patients significantly improved at post-treatment, with large improvements in worry, anxiety, and depression. In all but one case these were lasting changes. Recovery rates were 87.5% at post-treatment and 75% at 6 and 12 months. Wells, Welford, King & Papageorgiou (2010) compared MCT and applied relaxation in a pilot treatment trial of GAD. Twenty outpatients meeting criteria for DSM-IV-TR GAD were assessed before treatment, after treatment, and at 6- and 12- months follow-up. At post-treatment and at both follow-up points MCT was superior to applied relaxation. Standardized recovery rates for MCT at post-treatment were 80% on measures of worry and trait-anxiety compared with 10% following

applied relaxation. At 6 months follow-up recovery rates for MCT were 70% on both measures compared with 10% and 20% for applied relaxation. At 12 months follow-up recovery rates for MCT were 80% (worry) and 60% (trait-anxiety) compared with 10% and 20% following applied relaxation.

Heiden, Muris & Molen (2012) in their study showed that both MCT and intolerance-of-uncertainty therapy, but not delayed treatment, produced significant reductions in GAD-specific symptoms with considerable effects on, and high proportions of clinically significant change in various outcome measures, and the vast majority of the patients no longer fulfilled the diagnostic criteria for GAD. Results further indicated that MCT produced better results than intolerance-of-uncertainty therapy.

Although meta-cognitive factors can play a major role in the formation and persistence of many psychological disorders, there is very limited research carried out into meta-cognitive therapy. Also, the effect of MCT on anxious thoughts and meta-cognitive beliefs of individuals in comparison with CBT has not become salient. Therefore, the aim of this study is to investigate the effects of two therapies of MCT and CBT on decreasing meta-cognitive beliefs and anxious thoughts.

Method

Participants

In the initial phase of this study, 940 high school third graders answered the Generalized Anxiety Disorder Questionnaire-IV (GAD-Q-IV; Newman et. al., 2002). Then, using clinically-structured interview, students with scores higher than 24 in symptoms of GAD were interviewed and those who met the criteria for GAD were diagnosed. Finally, 60 participants were randomly selected from among 71 students with GAD. These participants were placed randomly in two experimental groups and one control group (20 participants in each group). At this stage, participants filled out the written informed consent form and certified their

full consent to participating in the study. The mean age of the participants was 16.7 and the standard deviation was 1.7.

The criteria for participating in this study were as follows: male gender, meeting diagnostic criteria for GAD according to DSMIV, not having any other mental disease, and not having any chronic physical illness.

Measures

The Generalized Anxiety Disorder Questionnaire-IV (GAD-Q-IV). GAD-Q-IV (Newman et al., 2002) is a self-report measure consisting of nine items derived from the DSM-IV criteria for GAD. Most items are yes–no questions that measure the excessiveness and uncontrollability of worry and the physical symptoms associated with worry. One question requests the individual to list his or her most frequent topics of worry. Two questions rate functional impairment and distress on a 9-point Likert scale ranging from 0 (''none'') to 8 (''very severe''). With a total possible score of 13, Newman et al. (2002) found the optimal cutoff score to be 5.7, where a good balance between sensitivity and specificity was found. However, Luterek, Turk, Heimberg, Fresco and Mennin (2002) administered the GAD-Q-IV along with the Anxiety Disorders Interview Schedule for DSMIV— Lifetime Version (ADIS-IV-L; DiNardo, Brown,& Barlow, 1994). Using a criterion-based scoring system, which requires each question to be matched to the diagnostic criteria of the DSM-IV, 51 of 53 non-anxious participants (96%) were correctly classified as not having GAD and 24 of 31 GAD patients (77%) were correctly classified as having GAD.

Meta-cognitions Questionnaire Short Form (MCQ). MCQ (Wells & Cartwright-Hatton, 2004) is a self–report measure consisting of 30 items. The MCQ30 was deemed to be a suitable substitute for the original scale, with good internal consistency and a factor structure consistent with the original scale. The alphas for these subscales were 0.72 to 0.93 and their test-retest reliabilities (over approx. 35 days) were 0.85 to 0.89. Wells & Cartwright-Hatton (2004) found that the MCQ subscales correlate

significantly and positively with convergent validity measures of worry. Wells (2008) reported Cronbach's alpha coefficient and test-retest reliability (after one month) of this inventory to be 0.86 and 0.82 respectively. Correlation coefficient for this inventory was significant according to the Spielburger trait-anxiety scale. In this study, Cronbach's alpha coefficient for this inventory was 0.90.

Anxious Thoughts Inventory (AnTI). The Anxious Thoughts Inventory (Wells, 1994) is a multidimensional measure of worry. It comprises three subscales which measure proneness to social worry, health worry, and meta-worry. These subscales correlated well with other measures of anxiety and their coefficients ranged between 0.75 and 0.84, indicating very good reliability. Cronbach's alpha coefficient was 0.90, indicating high internal consistency. High test–retest reliability was found at a 2-week interval with the correlation of 0.87. In this study, Cronbach's alpha coefficient for this inventory was 0.81.

Treatments

A) Meta-cognitive therapy (MCT). The MCT has been developed by Wells & King (2006). At the first session, while establishing good relationships with patients, necessary and adequate explanations about the problem were given to them and its causes and consequences were explained. Treatment rationale was also stated through giving a share to the patients in problem conceptualization. Then, at the end of that session, students filled out AnTI and MCQ (pretest). At the second and third sessions, impaired meta-cognitions were evoked and, after that, a case-based standardization was developed in order to elicit information about the nature and the content of anxiety. At the fourth session, reviewing recent anxious experiences, negative and positive beliefs about anxious thoughts were identified. At the fifth session, faulty appraisals and beliefs about anxious thoughts were drawn out. At the sixth session, meta-cognitive beliefs about anxiety were challenged. Moreover, while challenging mechanisms of association, the conflict between individual's

personality traits and thoughts evaluation were discussed, and their past and behavioral experiences were reviewed. At the seventh session, changing beliefs about danger (believing that worry can cause mental or physical damages) and changing positive beliefs (changing this belief that worry leads to the individual's better efficiency and facing the threat) were discussed. At the eighth session, a new substitute plan was employed in order to build confidence in memory and reduce patient's worry. At this session, in order to help patients keep themselves from rumination, they were taught techniques for attention diversion and concentration. In addition, strategic change (developing alternative strategies for thinking about the threat) and relapse prevention were done.

B) *Cognitive-behavioral therapy (CBT).* In order to apply the CBT in this study, the pattern devised by Meichenbaum & Butler in 1986 (the combination of Applied Relaxation and Cognitive Restructuring Technique) was utilized. At the first session, while establishing good relationships with patients, necessary and adequate explanations about the problem were given to them and its causes and consequences were explained. Treatment rationale was also stated through giving a share to the patients in problem conceptualization. Then, at the end of that session, students filled out AnTI and MTQ (pretest). At the second session, they were taught how to relax 14 muscle groups. At the third session, they were taught how to relax 6 muscle groups. At the forth session, they were taught how to relax 3 other muscle groups. At the fifth session, automatic, irrational, and task-irrelevant thoughts were identified. At the sixth session, subjects were assigned to rationally evaluate those thoughts, pay attention to their own thinking ways in solving problems, and find out their cognitive errors such as conception on the basis of all-or-nothing thinking, overgeneralizations, counting events disastrous, etc. and search for emotional and cognitive factors which lead to anxiety. At the seventh session, cognitive distortions/errors and irrational beliefs causing emotional and cognitive disturbance were discussed. At the eighth session, students were trained on how to challenge their irrational beliefs and

automatic, task-irrelevant thoughts, how to discuss them and then, how to substitute them with rational beliefs and positive and proper thoughts.

Procedure

Research inventories were administered to the two experimental groups and the control group in two phases of pretest and post-test. Participants received each of MCT and CBT in groups over 8 weekly sessions for two months by two psychology majors from Counseling Center of Education Office in Massal city. Those in control group remained in wait-list until post-test phase finished (2 weeks after treatment) and then they received therapy in group sessions. It should be noted that none of the participants in any of the three groups were under any therapies.

Results

The ages of participants ranged from 16 to 18. The mean age of participants in meta-cognitive group was 16.95 with a standard deviation of 0.78. The mean age of participants in cognitive-behavioral group was 16.74 with a standard deviation of .69 . And the mean age of participants in control group was 16.58 with a standard deviation of 0.63. 3 participants (18.8%) in meta-cognitive group, 2 participants (11.8%) in cognitive-behavioral group, and one participant (5.3%) in control group had a background of being failed.

Table 1 shows the means and standard deviations of anxious thoughts and meta-cognitive beliefs used in the research.

Table 1

Means and Standard Deviations of Anxious Thoughts and Meta-Cognitive Beliefs in the Experimental Groups and the Control Group

Group	MCT		CBT		C	
Variable	Pre Test	Post Test	Pre Test	Post Test	Pre Test	Post Test
Meta-cognition	80.25+9.50	55.81+9.96	83.01+9.74	64.05+11.83	78.47+8.55	77.42+9.16
anxious thoughts	60.87+5.56	43.01+6.32	62.35+9.38	48.52+8.26	60.01+4.78	49.52+5.78

MCT=Meta-Cognitive Therapy,   CBT= cognitive behavior therapy,   C=control

Table 2

Covariance Analyses to Effect of MCT and CBT on Meta-Cognitive Beliefs and Anxious Thoughts

Dependent Variable	Source	SS	Df	MS	F	Sig	Eta
Meta-cognition	Pre-test	10.78	1	10.78	.78	.38	.697
	Group	6004.27	2	3002.14	94.17	.000	.797
anxious thoughts	Pre-test	20.08	1	20.08	.63	.43	.684
	Group	3107.59	2	1553.79	112.06	.000	.824

Table 2 shows the Covariance analyses for meta-cognitive beliefs and anxious thoughts used in this research. Results from analysis of covariance, with control of pre-test scores, showed that there was no significant difference between measures of meta-cognitive beliefs of participants in three groups before conducting the research and at the post-test stage. In fact, effect of pre-test scores on post-test scores was not

significant. Through controlling this insignificant difference and with regard to the calculated F, the mean difference of meta-cognitive beliefs of three groups at post-test stage is statistically significant. Eta-square indicates that MCT and CBT led to an 80% decrease in impaired meta-cognitive beliefs of participants in experimental groups relative to those in control group.

Table 3

Tukey's Multi-comparisons of Meta-Cognitive Beliefs and Anxious Thoughts in the Two Experimental Groups and the Control Group

Dependent Variable	group	CBT	C
	MCT	-4.04*	-18.03**
Meta-cognition	CBT	-	-13.62**
	C	13.62**	-
anxious thoughts	MCT	-5.79*	-25.19**
	CBT	-	-19.39**
	C	19.39**	-

*$P<0.05$ **$P<0.01$

As Table 3 indicates, the Tukey's multiple comparison test showed that there is a significant difference in meta-cognitive beliefs scores between "MCT and control" groups, "CBT and control" groups, and "MCT and CBT" groups. In other words, MCT was more effective in decreasing meta-cognitive beliefs than CBT. In addition, Tukey's multiple comparison test showed that there is significant difference in anxious thoughts scores between "MCT and control" groups, "CBT and control"

groups, and "MCT and CBT" groups. In other words, MCT was more effective in decreasing anxious thoughts than CBT.

Discussion

In this study, the effects of MCT and CBT in decreasing anxious thoughts and meta-cognitive beliefs of high school students with GAD have been studied.

The findings of this study showed that MCT and CBT were significantly effective in decreasing anxious thoughts. In addition, MCT in comparison with CBT was more effective in decreasing anxious thoughts. In the same line, studies of Wells and King (2006), Wells et.al., (2010) and Heiden et.al., (2012) about the effect of MCT on individuals with GAD showed that recovery rate after applying MCT was higher than 75 per cent (from 75 to 87.5%).

Thus, it can be said that the decrease in anxious thoughts cannot be considered as the only reason for the patients being cured, because according to Wells' meta-cognitive model, individuals with GAD have beliefs and meta-beliefs that should be considered for more successful cure. In Well's model, patients with GAD have positive and negative ideas about their illness. During the process of worry, negative ideas are activated and this leads to negative estimation of the process of worry (worry type II) which influences emotional responses. The relationship between worry type II (worry about worry) and emotion forms a vicious circle in which cognitive symptoms related to anxiety could be interpreted as evidence for lack of control or damaging nature of worry. Since relaxation helps greatly to control physical responses of anxiety, it can cause reductions in anxiety symptoms and, as a result, cognitive reconstruction in these patients will take place more easily. The aim of cognitive-behavioral approach is first of all to help patients develop a new concept for their anxiety and their ability to control it. Describing and stating the problem, and recognizing the role of thoughts and emotions in

decreasing wrong interpretations about anxiety as being disastrous and uncontrollable can be effective (Wells & King, 2006).

In MCT, meta-beliefs of patients with GAD that lead to negative emotions as well as inefficient responses are addressed. Thus, the CBT applied in this research could decrease anxious thoughts but the decrement was significantly less than that of MCT (Wells, 2000).

The findings of this study showed that MCT and CBT were significantly effective in decreasing meta-cognitive beliefs of students with GAD, though MCT was more effective in decreasing confounding meta-cognitive beliefs. This finding suggests that MCT decreased meta-cognitive beliefs more than CBT did. In this regard, it should be mentioned that CBT affected components of cognitive trust as much as MCT did because the essence of CBT is to change and challenge unreasonable thinking methods (Chris & Brewin, 2006). The focus in Wells' model is on a specific balance between cognition and meta-cognition processes in maintaining anxiety disorder and the aim of MCT is to affect worry type II. Whereas, the focus in CBT is on reconstruction of worry type I and this type of worry is related to non-meta-cognitive beliefs (Wells, 1997). Wells' model shifts the focus of interventions towards changing positive and negative beliefs about worry. Since worry is related to negative and positive thoughts, therefore, those ideas and beliefs must have significant correlation with the capacity for worry. In addition, since having negative ideas is the significant symptom of worry in GAD, those with this disorder must have more negative ideas than other patients do; this has been proved through a number of studies (Wells, Carter, 2001; Cartwright-Hatton, Wells, 1997). These results are also consistent with findings of other studies about GAD (Wells & King, 2006), compulsive-obsessive disorder (Wells & Papageorgious, 1998; Gwilliam, Wells & Certwright- Hatton, 2004) and post-traumatic stress disorder (Holeva, Tarrier & Wells, 2001; Wells & Sembi, 2004). In these studies, MCT has effectively caused recovery in patients.

It can be asserted that there are two reasons causing MCT to have greater effect on meta-cognitive thoughts than CBT. Firstly, MCT offers a model for how GAD is formed and persisted, and the treatment of this disorder is also based on that model. Secondly, MCT adopts a specific order in dealing with the issue of treatment and emphasizes greatly meta-cognitive thoughts that can have considerable effect on meta-cognitive thoughts of patients during the process of treatment.

On the whole, the results suggest that MCT has acted more effectively in decreasing anxious thoughts and meta-cognitive beliefs of students than CBT. The results obtained from this research, while highlighting the importance of MCT in comparison with CBT in decreasing meta-cognitive beliefs and anxious thoughts, are especially important. MCT can have helpful effects on cognitive modifications and styles of patients to confront anxiety disorders. Also, the results of this research have important implications for therapy and future researchers.

Limited number of sessions (8 sessions), control group's not attending usual counseling sessions in order to remove placebo effect of treatment groups, the sample of research being exclusively male students, and lack of follow-up are among limitations of this research which prompt us to be cautious in generalizing the results. Moreover, considering the specific entrance criteria that have been observed in selecting the sample for the present research, special care is required when generalizing the results to individuals outside this area. It is suggested that the same research be done with placebo group. Another suggestion is to follow up and study permanency of treatment. It is also suggested that, in future studies, other treatment techniques that have been acknowledged as being effective in curing anxious patients be used in comparison with MCT.

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