OPEN ACCESS

ISSN: 2676-7473

RBMS.2021;26(1):e21



ORIGINAL RESEARCH

# The efficacy of metacognitive therapy on emotional processing components of patients with functional dyspepsia: controlled clinical trial

Sepideh Batebi[1], Abbas Masjedi Arani[2*], Mahdi Jafari[2], Amir Sadeghi[3], Mohsen Saberi Isfeedvajani[4], Mohammad Hasan Davazdah Emami[5]

1. *Ph.D Candidate in Clinical Psychology, Department of Clinical Psychology, Faculty of Medicine, Shahid Beheshti University of Medical Sciences, Tehran, Iran*
2. *Ph.D, Department of Clinical Psychology, Faculty of Medicine, Shahid Beheshti University of Medical Sciences, Tehran, Iran*
3. *MD, Gastroenterology and Liver Diseases Research Center, Research Institute for Gastroenterology and Liver Diseases. Shahid Beheshti University of Medical Sciences, Tehran, Iran*
4. *M.D, Quran and Hadith Research Center & Department of Community Medicine, Faculty of Medicine, Baqiyatallah University of Medical Sciences, Tehran, Iran*
5. *Ph.D, Department of health Psychology, Isfahan University of medical Science, Isfahan, Iran*

*Corresponding Author:
Address: Department of Clinical Psychology, Faculty of Medicine, Shahid Beheshti University of Medical Sciences, Tehran, Iran.
Email: d.masjediarani@sbmu.ac.ir
ORCID: 0000-0003-2939-8115

*Date Received: September, 2020* *Date Accepted: October, 2020* *Online Publication: September 15, 2021*

## Abstract

**Background:** Functional dyspepsia is characterized by a set of symptoms in the upper gastrointestinal tract due to an underlying organic cause and is one of the common causes of patients 'visits to gastroenterologists. A few researches have been conducted on the effectiveness of psychotherapy with respect to the psychological components of these patients. Therefore, the purpose of this study is to investigate the effect of metacognitive therapy on emotional processing components of these patients.
**Materials and Methods:** In this study, 40 patients with dyspeptic symptoms were recruited after medical examination by gastroenterologists, performing H. Pylori test and undergoing endoscopy. Moreover, 20 of the patients were randomly assigned to a group for metacognitive therapy and another 20 to the control group. The Baker's emotional processing questionnaire was used at pre-treatment, post-treatment and three months after treatment for evaluating changes in patients' emotional processing styles. Finally, repeated measures analysis of variance was employed for data analysis by using SPSS 19.
**Results:** The research data that was obtained by repeated measures analysis of variance indicated statistically significant differences in three emotional processing scales in metacognitive therapy group compared to the control group at pre-treatment, post-treatment and three months after treatment.
**Conclusion:** Compared to the control group, the metacognitive therapy of functional dyspepsia patients was more effective in the short- and long-term for coping with difficulty in emotional recognition and experience, difficulty in emotional control and expression as well as inadequate emotional processing.

**Keywords:** Metacognitive therapy, Functional dyspepsia, Emotional processing, Controlled trial

**Introduction**

Dyspepsia is one of the most common gastrointestinal disorders and comprises 30 to 40% of visits to gastroenterologists. Between 50 to 60% of the referents are diagnosed with non-ulcer or functional dyspepsia (FD) [1]. According to Rome IV criteria, FD is defined by pain and discomfort in epigastric region, which occurs continuously or intermittently over a period of 3 to 12 months. This pain or discomfort does not include evidences for justifying a physical disease. These symptoms may include early satiety, postprandial saturation, belching, bloating and nausea [2-4]. Visceral hypersensitivity in these patients can lead to further perception and processing of neuro-gastrointestinal information. Genetic proneness in these patients is associated with the C825T polymorphism of GNB3 gene and homozygous GNB3 825C [5].

The psycho-social factors related to the disease including grief, marital problems and workplace conflicts may initiate and exacerbate the disease by increasing acid secretion and mobility in the gastrointestinal tract [5-7].

Traumatic life events, such as childhood sexual abuse, may contribute to the pathology of the disorder although the related mechanism is still unclear and may be further associated with weaker long-term outcomes and psychiatric problems [6].

Risk for some mental disorders, such as depression, panic attack and agoraphobia is high in these patients. Personality traits including emotional instability, poor coping skills, excessive neuroticism and disproportionate enmity feeling are prevalent in these patients [6,8].

In FD patients, the lifetime prevalence of generalized anxiety disorder (GAD) is 34% and the prevalence of anxiety disorders is 38%. Moreover, depression, anxiety, panic, somatization symptoms and neuroticism are significantly related to the severity of symptoms in these patients [9].

With regard to a higher prevalence of anxiety disorder in these patients [9-12], the distinguishing factor between patients with GAD and unaffected individuals is high-level negative emotional experience. Patients with GAD are biologically prone to respond severely to negative emotions and to be affected by extreme negative and threatening stimuli. Anxiety is due to attention to threatening and negative stimuli and distorts accurate judgment of events [13-15].

Moreover, in addition to causing attention bias, confused emotions cause deficiency in emotional processing. People who choose maladaptive styles during emotional processing are vulnerable to emotional problems [13].

During emotional processing, the emotional or psychological disturbances are absorbed. These disturbances are reduced to an extent that the person can continue other experiences and behaviors without being emotionally disturbed [16]. According to Baker, emotional processing is classified into three scales, i.e., difficulties in emotional recognition and experience (ERAE), difficulties in emotional control and expression (ECAX) and inadequate/not enough emotional processing (NEEP). Baker believes that emotional processing in each of these three scales can be impaired [17].

Metacognitive theory specifically explains worry in anxiety disorders. In this theory, when a fearful event predicted by the person does not occur, the metacognitive beliefs are reinforced, and this increases the avoidant behaviors. Finally, this procedure is followed by increased worry and anxiety, so the person is engaged in a vicious cycle of emotional dysregulation, inappropriate behaviors, maladaptive metacognition and anxiety [18-20].

The effectiveness of metacognitive therapy on anxiety disorders have been investigated in several researches [20-24]. To the best of knowledge, there has been no research that has focused on the effects of metacognitive therapy on the emotional processing styles of patients with FD. However, a limited number of researches has been dedicated to study the role of other types of psychotherapy in the symptoms and disorders of these patients.

The present research studies the effects of metacognitive psychotherapy on emotional processing styles of patients with FD; these styles include recognition/experience, control/expression and inadequate emotional processing in short-term and three months after treatment, which are compared to the control group.

## Materials and Methods

Forty patients with dyspepsia were recruited during their visit to the gastrointestinal clinic of Taleghani hospital. These patients were examined by gastroenterologists based on Rome-IV criteria and underwent endoscopy for rejecting the underlying factors as the dyspeptic symptoms. Moreover, the patients were interviewed based on DSM-V to reject severe psychiatric disorders. The inclusion criteria were: 1) having no comorbid gastrointestinal disorder; 3) no severe psychiatric disorders; 4) not being on other medications; 5) no drug dependency; 6) age between 18 and 55 years; 7) ability to read and write. The exclusion criteria were: 1) non adherence to treatment protocols; 2) noncompliance with common treatment protocols for all patients; 3) starting to take medications out of treatment protocols; 4) initiation of drug use; 5) absence in two consecutive or three intermittent psychotherapy sessions; 6) unwillingness to participate in the therapy for any reason at any stage of the study.

After signing the consent form for participating in the study, the patients were randomly assigned into metacognitive therapy and control groups. Then, all patients were given consultation, in a session, on dietary advice and regular aerobic exercise. For the patients, routine medications, which included esomeprazole (40 mg, once daily) and domperidone (10 mg, once daily), were administrated. The patients in the metacognitive therapy group received the therapy with focus on anxiety relieving for 10 (45-minute) sessions once a week. The summarized contents of the sessions were as follows: Session 1) case formulation, being acquainted with the metacognitive model, initiating to challenge metacognitive beliefs and initial detached mindfulness exercise; Session 2) continuing to challenge uncontrollability negative metacognitive beliefs and applying cognitive techniques; Session 3) continuing to challenge uncontrollability beliefs, using behavioral techniques to eliminate avoidant behaviors; Session 4) challenging danger beliefs; Session 5) continuing to challenge metacognitive beliefs about danger using behavioral techniques; Session 6) reversing remaining maladaptive strategies; Session 7) beginning challenging positive metacognitive beliefs; Session 8) continuing challenging positive metacognitive beliefs using behavioral techniques; Session 9) continuing treatment of residual symptoms and forming a new processing style; Session 10) relapse prevention and continuing working on the new plan. The control group only received the usual medical treatment included esomeprazole (40 mg, once daily) and domperidone (10 mg, once daily), diet and exercise. The patients were evaluated at pre-treatment, post-treatment and three months after treatment using Baker's emotional processing questionnaire. Data analysis was performed by repeated measures analysis of variance using SPSS 19. At the end of the study, 3 patients from the metacognitive therapy group and 5 patients from the control group were excluded due to failing to participate in therapy and evaluation sessions. Actually, data analysis was performed on 17 patients from the metacognitive intervention group and 15 from the control group. The present study had received a Code of Ethics (IR.SBMU.MSP.REC.1396.756), before its start, from the Research Committee of Shahid Beheshti University of Medical Sciences, Tehran, Iran. Moreover, the study registered at the Iranian Registry of Clinical Trials with IRCT20190312043036N1.

Clinical interview based on Rome-IV diagnostic criteria for functional gastrointestinal disorders: Clinical interview based on Rome-IV diagnostic criteria for functional gastroin-testinal disorders performed by gastroenterologists at pre-treatment, post-treatment and three months after treatment.

Endoscopy: In the first step of evaluation in the process of the study, the FD patients underwent upper gastrointestinal endoscopy to rule out underlying symptoms of gastric ulcer.

H-pylori test: Blood test for diagnosing H-pylori infection was performed by gastroenterologists during the initial evaluation to rule out the presence of an infectious agent.

Structured clinical interview for DSM-V (SCID-V): The structured psychiatric clinical interview was conducted by a clinical psychologist in the psychiatric evaluation session to evaluate mental and personality

disorders based on the diagnostic and statistical manual of mental disorders, fifth edition (DSM-V).

Emotional Processing Scale: Emotional processing scale (EPS) developed by Baker et al. [17, 25] is a 38-item self-report questionnaire, which is used to measure emotional processing styles. Each item is rated on a 5-point Likert scale (ranging from strongly disagree to strongly agree). This scale has three main areas difficulty in recognizing and experiencing emotion, difficulty in controlling and expressing emotion and inadequate emotional processing. These area has eight subscales (intrusion, suppression, lack of attunement, lack of control, dissociation, avoidance, discordant and externalized). Cronbach's alpha and test-retest coefficients of this scale were reported as 0.5 and 1.5, respectively. In a preliminary study performed on 40 students, the correlation coefficient between this scale and the emotion regulation scale, which gives the validity coefficient, was -0.54 (at the 0.01 level). In another study, the Cronbach's alpha coefficient was calculated as 0.95 [26]. Cronbach's alpha coefficient of total questionnaire was reported as 0.85 and for three main subscales (difficulty in recognizing and experiencing emotion, difficulty in controlling and expressing emotion and inadequate emotional processing) were 0.82, 0.75 and 0.72 respectively [27].

## Results

The sample included patients aging between 20 and 50 years with M=37.03 and SD=8.9 (mean age and standard deviation), mainly female (84.4%, 27), married (68.8%, 22), high school graduates/dropouts (53.1%, 17) and predominantly unemployed (59.41%, 19). The number of patients in MCT group was 17 (53%) and in the control group 15 (46%). The mean differences of demographic variables showed no significant difference among the means of metacognitive therapy and control group; this implies the homogeneity of the demographic variables in these groups.

Table 1 shows the mean and standard deviation of the two groups for the scores of emotional processing subscales (difficulty in recognizing and experiencing emotion, difficulty in controlling and expressing emotion and inadequate emotional processing) at pre-test, post-test and follow-up phases. According to the table, the patients in the MCT group had the lowest mean subscale scores, and the patients in the control group had the highest mean scores at post-treatment and follow-up phases.

Table 1: Mean and standard deviation of emotional processing subscales scores in three groups at pre-test, post-test and follow-up phases.

The results of Mauchly test for two variables of difficulty in emotional recognition and experience and difficulty in controlling and expressing emotion were significant; however, the results of the test for the variable of inadequate emotional processing were insignificant. Furthermore, the Greenhouse-Geisser test results for the first two variables and the sphericity assumed test results for the third variable are given in Table 3. Finally, the statistical significances of all three variables can be concluded from the table; this indicates that the mean scores of the variables have changed over time ($P < 0.05$).

Table 1: Mean and standard deviation of variables of the three groups in pretest, posttest and follow up.

| Variables | Phases | MCT± Mean (SD) | Control Mean (SD) |
|---|---|---|---|
| ERAE¶ | Pre test | 39.82 (8.05) | 43.00 (4.82) |
| | Post test | 24.59 (5.91) | 42.87 (4.51) |
| | Follow up | 24.65 (5.17) | 43.00 (4.78) |
| ECAX* | Pre test | 41.18 (8.74) | 49.00 (5.90) |
| | Post test | 23.65 (4.79) | 48.13 (5.74) |
| | Follow up | 24.06 (4.64) | 48.20 (6.14) |
| NEEP¥ | Pre test | 21.94 (3.41) | 22.67 (2.89) |
| | Post test | 11.53 (4.31) | 22.60 (2.72) |
| | Follow up | 10.41 (3.18) | 22.47 (2.50) |

±Metacognitive therapy
¶: Difficulties in emotional recognition and experience
*: Difficulties in emotional control and expression
¥: Inadequate emotional processing/not enough emotional processing

Table 2: repeated measures analysis of within-subject effects of emotional processing variables

Moreover, the results of the within-subjects effects show that the effects of treatments on the difficulty in emotional recognition and experience ($F=1835.73$), difficulty in control and express emotions ($F=1723.49$) and inadequate emotional processing ($F=1333.92$) were significant ($P<0.05$). These results indicate that the administered treatments, in at least two groups, were effective on the variables scores at post-treatment and follow-up sessions.

Additionally, the eta effect size of the groups obtained for the variables were 0.67, 0.76 and 0.67 (corresponding to the difficulty in emotional recognition and experience, difficulty in controlling/expressing emotions, inadequate emotional processing,

respectively), and the effect size for time-group interaction of these variables were 0.98, 0.98 and 0.97 (P <0.05), respectively, which implies a high effect on these three variables over time.

Table 2: repeated measures analysis within subject effects of variables

| Variables | Source | Sum of square | Df | Mean square | F | P-value | Partial Eta squared |
|---|---|---|---|---|---|---|---|
| ERAE | Time | 1239.29 | 1.4 | 839.92 | 41.46 | 0.000 | 0.58 |
| | Time*group | 1217.62 | 1.4 | 825.23 | 40.73 | 0.000 | 0.57 |
| | Error | 896.64 | 44.2 | 20.25 | | | |
| ECAX | Time | 1752.29 | 1.2 | 1380.09 | 59.80 | 0.000 | 0.66 |
| | Time*group | 1445.08 | 1.2 | 1138.14 | 49.31 | 0.000 | 0.62 |
| | Error | 879.06 | 38.09 | 23.07 | | | |
| NEEP | Time | 661.25 | 2 | 330.62 | 93.69 | 0.000 | 0.75 |
| | Time*group | 627.79 | 2 | 313.89 | 88.95 | 0.000 | 0.74 |
| | Error | 211.72 | 60 | 3.52 | | | |

The results of the pairwise comparisons of the groups after Bonfferoni adjustment (Table 3) show a statistically significant difference in the variables scores between the metacognitive therapy and control groups (P<0.05).

Table 3: pairwise comparison of variables between metacognitive therapy, nortriptyline and control groups.

| | | ERAE | | | ECAX | | | NEEP | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Group | Group | MD | SD | P | MD | SD | P | MD | SD | P |
| MCT | Control | -13.26* | 1.69 | 0.000 | -18.81* | 1.88 | 0.000 | -7.95* | 1.01 | 0.000 |

Table 4 presents the results of pairwise comparisons in groups at pre-treatment, post-treatment and follow-up phases. The after Bonferroni adjustment for multiple comparisons used. Then the results show that, for the scores of all three variables in the MCT group, there are statistically significant differences between pre-treatment and post-treatment phases as well as between pre-treatment and Follow-up phases. However, no significant difference was found for the scores of all three variables in the MCT group between post-treatment and follow-up phases. In addition, for the scores of emotional processing variables at the three phases in the control group, there was no significant difference (P<0.05).

Table 4: pairwise comparison in three phases (pre-test, post-test and follow up) of variables among three groups separately.

| | | ERAE | | ECAX | | NEEP | |
|---|---|---|---|---|---|---|---|
| Groups | Phases | Posttest | Follow up | Posttest | Follow up | Posttest | Follow up |
| MCT | Pretest | 15.23* | 15.17* | 17.52* | 17.11* | 10.41* | 11.52* |
| | Posttest | - | -0.05 | | -0.41 | | 1.11 |
| Control | pretest | 0.13 | 0.21 | 0.86 | 0.80 | 0.06 | 0.20 |
| | Posttest | | -0.13 | | -0.06 | | 0.13 |

*: P<0.05

## Discussion

The present study was intended to evaluate the effectiveness of MCT on emotional processing styles of patients with FD. The results of administering 10 sessions of MCT to 17 FD patients were compared to the results of 15 patients of the control group. This comparison showed that, the MCT improves the difficulty in emotional recognition and experience, difficulty in emotional control and expression and inadequate emotional processing, both in short-term and three months after treatment. The results of the evaluations showed an improvement in emotional processing at pre- and post-treatment phases as well as in the follow-up session.

Metacognitive therapy improves cognitive-attentional syndrome, as an etiologic factor in psychosomatic disorders, eliminates anxiety and the perseverative cycle of positive and negative metacognitive beliefs, and finally, reduces the symptoms [19-21]. Due to a high rate of comorbidity of FD with generalized anxiety disorder (GAD) [9-12], these patients with GAD have impaired emotional control [13-15]. Therefore, FD patients have deficiency in this field. That is, patients with FD have difficulty with intrusion, suppression, impulse control and dissociation that are associated with emotional control, emotional expression and inadequate emotional processing.

As Baker suggested [25], the three main scales of emotional processing are difficulty in emotional recognition and experience, difficulty in emotional control and expression and inadequate emotional processing. Accordingly, there are eight subscales including the lack of attunement, discordant, externalized, suppression, dissociation, avoidance, uncontrolled and intrusion. An important issue is that emotional disturbances have different exhibitions in different disorders.

Patients with anxiety disorder have an impaired ability to absorb and reduce negative emotions. Accordingly, these people find the environment threatening and challenging. Moreover, these people have dysfunction of emotional expression and control. This dysfunction results from their unsuccessful attempt to adapt to the environment. As well the impaired emotional regulation as one of

the characteristics of GAD [28-31]. Finally, as the level of worry and anxiety reduces in patients with FD, the emotional processing is improved in these patients.

To the best of our knowledge from the literature review, there has been no study in the field of psychosomatic disorders that has been dedicated to investigate the effect of different treatments on emotional symptoms, emotional processing styles and emotion regulation strategies. This is one of the main limitations of the present study to point to results of other studies. Although few researches have considered the effect of psychotherapy on psychosomatic symptoms of FD patients, it is not yet possible to find the exact contribution/impact of psychological therapies and even that of medications on these patients. Indeed, almost no standard FDA approved treatment (even medication) is available for this psychosomatic disorder.

Another limitation of this research is the lack of more objective measurements, such as video and computer-based tools, as well as the absence of valid experimental tools and impossibility to detect the problems with emotional processing in a laboratory and quasi-experimental environments. Actually, controlled laboratory environments can provide more reliable data on the emotional processing problems of the patients.

Future researches can be conducted by using a higher number of participants and larger sample sizes with diverse social groups. Moreover, objective and empirical assessment instruments can be used to investigate the problems of the patients with emotional regulation and processing. Further clinical trials with focus on emotions can also be performed for investigating the effect of psychotherapy on emotional and mood symptoms of the patients with FD.

The results of the present research showed the effectiveness of MCT in improving three components in emotional processing, i.e., difficulty in emotion recognition and emotional experience, difficulty in control and expression as well as inadequate emotional processing in the short and long term assessment.

**Conflict of interest**

Authors declare no conflict of interest.

**Acknowledgement**

We would like to express our sincere gratitude to all respected staff and doctors of Research Institute for Gastroenterology and Liver Diseases of Shahid Beheshti University of Medical Sciences and gastroenterology clinics related to Shahid Beheshti University of Medical Sciences, Dr M. R. Zali, Dr M. Iranshahi, Dr S. Abdi, Dr H. Malekpour and Dr A. Hekmat Doust, for their invaluable assistance.

**References:**


1. Soo S, Moayyedi P, Deeks J, Delaney B, Lewis M, Forman D. Psychological interventions for non-ulcer dyspepsia. Cochrane Database Syst Rev 2005; 3: CD002301.
2. Schmulson MJ, DA Drossman. What is new in Rome IV. J Neurogastroenterol Motil 2017; 23(2): 151-163.
3. Talley NJ, Ruff K, Jiang X, Jung HK. The Rome III Classification of dyspepsia: will it help research?. *Dig Dis* 2008; 26: 203-209.
4. Talley NJ, Holthman G. Approach to the patient with dyspepsia and related functional complaints. In:Yama dat . textbook of gastroenterology: from lippincott wilkins. 3rd ed Philadelphia, VSA, 1999; 82-100.
5. Allescher, H., *Functional dyspepsia–a multicausal disease and its therapy.* Phytomedicine, 2006. **13**: 2-11.
6. Smith, M.L., *Functional dyspepsia pathogenesis and therapeutic options—implications for management.* Digestive and liver disease, 2: 37 (8): 547-558.
7. Olden, K.W. and D.A. Drossman, *Psychologic and psychiatric aspects of gastrointestinal disease.* Medical Clinics of North America, 2000. **84**(5): p. 1313-1327.
8. Jess, P. and J. Eldrup, The personality patterns in patients with duodenal ulcer and ulcer-like dyspepsia and their relationship to the course of the diseases. Journal of internal medicine, 1994. **235**(6): p. 589-594.
9. Wu JC. Psychological co-morbidity in functional gastrointestinal disorders: epidemiology, mechanisms and management. J Neurogastroenterol Motil 2012; 18(1): 13-18.
10. Aro P, et al. Anxiety is associated with uninvestigated and functional dyspepsia (Rome III criteria) in a Swedish population-based study. Gastroenterology 2009; 137(1): 94-100.
11. Van Oudenhove L, et al. Relationship between anxiety and gastric sensorimotor function in functional dyspepsia. Psychosom Med 2007; 69(5): 455-463.
12. Li Y, Nie Y, Sha W, Su H. The link between psychosocial factors and functional dyspepsia: an epidemiological study. Chin Med J 2002; 115(7): 1082-1084.
13. Taylor, C. T., Bomyea, J., & Amir, N. (2010). Attentional bias away from positive social information mediates the link between social anxiety and anxiety vulnerability to a social stressor. *Journal of Anxiety.*
14. Singh, J. S., Capozzoli, M. C., Dodd, M. D., & Hope, D. A. (2015). The Effects of Social Anxiety and State Anxiety on Visual Attention: Testing the Vigilance–Avoidance Hypothesis. *Cognitive behaviour therapy*, 44(5), 377-388.
15. Bohon, C., Hembacher, E., Moller, H., Moody, T. D., & Feusner, J. D. (2012). Nonlinear relationships between anxiety and visual processing of own and others' faces in body dysmorphic disorder. *Psychiatry Research: Neuroimaging*, 204(2), 132-139.
16. Rachman, S. (2001). Emotional processing, with special reference to posttraumatic stress disorder. International Review of Psychiatry, 13, 164- 171.
17. Baker, R., Thomas, S., Thomas, P. W., & Owens, M. (2007). Development of an emotional processing scale. Journal of Psychosomatic Research, 62(2), 167-178.
18. Normann, N., A.A. van Emmerik, and N. Morina, *The efficacy of metacognitive therapy for anxiety and depression: A meta-analytic review.* Depression and Anxiety, 2014. **31**(5): 402-411.
19. Wells, A., *Metacognitive therapy for anxiety and depression*. 2011: Guilford press.
20. Wells, A. and P. King, *Metacognitive therapy for generalized anxiety disorder: An open trial.* Journal of behavior therapy and experimental psychiatry, 2006. 37(3): 206-212.

21. Wells A. Metacognitive therapy for anxiety and depression. New York, NY, US: Guilford Press, 2009: 89-96.
22. Wells A. Cognition about cognition: Metacognitive therapy and change in generalized anxiety disorder and social phobia. Cogn Behav Pract 2007; 14(1): 18-25.
23. Wells A. A metacognitive model and therapy for generalized anxiety disorder. Clin Psychol Psychother 1999; 6(2): 86-95.
24. Wells A, Welford M, King P, Papageorgiou C, Wisely J, Mendel E. A pilot randomized trial of metacognitive therapy vs applied relaxation in the treatment of adults with generalized anxiety disorder. Behav Res Ther 2010; 48(5): 429-434.
25. Baker, R., Thomas, S., Thomas, P. W., Gower, P., Santonastaso, M., & Whittlesea, A. (2010). The Emotional Processing Scale: scale refinement and abridgement (EPS-25). Journal of psychosomatic research, 68(1), 83-88.
26. Abolghasemi, A., *The Relationship between Non-verbal Behaviors, Emotional Processing and Recognition with Positive and Negative Symptoms in Pietients with Schizophrenia Patient.* Journal of Rafsanjan University of Medical Sciences, 2013. **12**(2): p. 89-102.
27. Lotfi S, Abolghasemi A, Narimani M. A Comparison of Emotional Processing and Fear of Positive/negative Evaluations in Women with Social Phobia and Normal Women. Knowledge and Research in applied Psychology 2013. 14(3): 101-111.
28. Mennin, DS.; Turk, CL.; Heimberg, RG. Clinical presentation and descriptive psychopathology of generalized anxiety disorder. In: Heimberg, RG.; Turk, CL.; Mennin, DS., editors. Generalized Anxiety Disorder: Advances in Research and Practice. New York: Guilford Press; 2004. p. 3-28.
29. Mennin DS, Heimberg RG, Turk CL, Fresco DM. Preliminary evidence for an emotion regulation deficit model of generalized anxiety disorder. Behaviour Research and Therapy. 2005; 43:1281–1310.
30. Mennin DS, Holaway R, Fresco DM, Moore MT, Heimberg RG. Delineating components of emotion and its dysregulation in anxiety and mood psychopathology. Behavior Therapy. 2007; 38:284–302.
31. Mennin DS, Mclaughin KA, Flanagan TJ. Emotion regulation deficits in generalized anxiety disorder, social anxiety disorder, and their co-occurrence. J Anxiety Disord. 2009 October ; 23(7): 866–871.