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Comparison of the influence of eye movement desensitization therapy and reprocessing (EMDR) and cognitive-behavioral therapy (CBT) method on reducing post-traumatic stress disorder in the War Injured

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Abstract— Introduction: The present research tries to compare the effectiveness of two therapy methods of EMDR and CBT in PTSD. Statistical population included 400 people of 8-year Iran-Iraq war injured who referred to military clinics. 45 people were picked as sample size by means of cluster random sampling. They were put into two groups: experiment group and control group. The present research is an experimental study which involves intervention. Research design is of pretest-posttest type and has a control group. Instruments which were used for data collection include military post-traumatic stress disorder questionnaire (pcl), 8-session CBT package and 8-session EMDR package. Covariance method was used for data analysis.

Materials and methods: statistical population of the present research included all of The Injured of 8-year War imposed on Iran by Iraq. Sample size was 200 people and sampling method was random cluster sampling. 45 people were randomly selected from among 80 respondents who received an acceptable quota from Checklist questionnaire (pcl). They were put into 3 groups: 2 experiment groups and 1 control group. Respondents received 8 sessions of cognitive-behavioral training and 8 sessions of eye movement treatment and reprocessing. Then, the respondents received posttest. Data was analyzed by ANCOVA analysis and using SPSS.

Results: results showed that there is a significant difference between post-traumatic stress disorder mean in eye movement therapy group and cognitive-behavioral therapy group. Results also showed that there is a significant difference between post-traumatic stress disorder mean in the control group and eye movement therapy group. There is also a significant difference between post-traumatic stress disorder in control group and cognitive-behavioral therapy (CBT) group.

Conclusion: Results showed that desensitization therapy methods through eye movement therapy and reprocessing and CBT method influence on reducing post-traumatic stress disorder and eye movement therapy method are more effective than CBT method.

Index Terms— Cognitive-Behavioral Therapy (CBT), Desensitization Through Eye Movement And Reprocessing, Post-Traumatic Stress Disorder.

1 Introduction

POST-TRAUMATIC stress disorder (PTSD) is a unique, complex and chronic anxiety disorder and has symptoms like trauma memories re-experience, avoidance of situations which make the trauma alive and emotional numbness and excess stimulation like stimulability, reduction I concentration and exaggerated responses (Carlson et al, 1998; Dobie et al, 2002). These symptoms influence considerably on individuals' lives and affect their occupational, social and academic performance (Chossegros, 2011). Many people express PTSD symptoms immediately after experiencing an accident. If such individuals avoid remembering the trauma, PTSD symptoms may become chronic (Foa, 2006).

In addition to main symptoms, there are subsidiary symptoms like problems in inter-individual communications, isolation, inability to control emotions, addiction to drugs and alcohol, aggression, violence, sense of hopelessness and humiliation, sense of embarrassment, anger, divorce and other types of general physical problems (Panagioti et al, 2009). Studies show that pharmaceutical therapy cannot be effective on individuals' treatment after trauma (Foa et al, 1995).

EMDR technique is used to adjust negative thoughts and replace them with positive thoughts and adjust physical changes through desensitization. EMDR is a kind of exposure therapy which is used for therapy-seeker who suffer from harmful

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stress. This method involves imaginary immersion, cognitive reconstruction and rapid and harmonic use of eye movements and mutual stimulation. This method was introduced by Shapiro and is a kind of behavioral intervention (Shapiro & rancine, 2003) and it is an effective method which is used to help individuals who suffer from psycho-wounds resulted from traumatic experiences, anxiety, horror, unwelcome memories and PTSD, morning and other emotional problems (Chambless, 1998; Davidson & Parker, 2001; Foa, 2000). Effectiveness of this method has been verified in many studies.

Rothbaum (1997) concluded that EMDR treated 90% of research participants completely from PTSD. Van Etten and Taylor (1998) dealt with the effectiveness of 14 types of therapy methods on PTSD (n=216). Results showed that 13 groups found EMDR as effective as behavior-therapy and 4 studies referred to EMDR efficiency in prevention from re-attraction (relapse) of Serotonin. Cusack and Spates (1999) conducted a research titled " application of EMDR to PTSD." They treated 27 individuals through EMDR or only EMD. Two-factor variance analysis showed that both methods have significant influence on reducing the symptoms of PTSD. The results of 5 years of study o 13 veterans who suffered from PTSD showed that experiment group has better therapy than control group (Macklin et al, 2000). Shniderman et al (2005) conducted a case study and showed that after EMDR therapy, a significant improvement is resulted in depression and anxiety symptoms and PTSD symptoms. Francis Shapiro (1998) believes that 84-100% of those who suffered from PTSD were treated in the last four decades by means of EMDR method. Results of studies conducted by Puk (1991), Welpi and Abramz (1991) and Policer (1993) verified the effectiveness of EMDR method. Carlson et al (1998) verified the influence of EMDR method on war injured soldiers. Results of studies conducted by Vaughan et al (1994) showed that EMDR is effective on reducing all types of anxieties. Schneiderman et al (2005) showed that EMDR reduces anxiety disorders, distress, and increases self-confidence and positive self-knowledge significantly.

Cognitive-behavioral treatment (CBT) is another therapy method for treating PTSD especially war injured disorders. This phrase was first used in middle 1970s. the first therapy controlled experiments were published in the end of this decade. CBT deals with cognitions which result in changing excitements, thoughts and behaviors and is made up of combination of behavior-therapy approach (which mainly concerns Pavlovian and Neo-Pavlovian conditioning) and cognitive approach-whether in the form of cognition-therapy or in the form of cognitive psychology and basic cognition knowledge. This approach uses concepts and phrases which have meaning in behavioral format and can be measured and evaluated (Hawton et al, 1984). Foa et al (1991) showed that women who had been raped and suffered from PTSD were significantly improved and treated after receiving treatments like stress inoculation, supportive consulting and prolonged exposure in posttest and follow-up test. Weine et al (1998) investigated CBT along with exposure. Results showed that PTSD reduced from 100% to 75% after treatment. Furthermore, Tarrier et al (1999) showed that cognition-therapy and exposure reduce PTSD symptoms in 32-35% of individuals and reduce depression in 27-31% of individuals and reduces general anxiety 23-25% of individuals. Triffleman et al (1999) conducted a research titled "treatment ofPTSD using CBT approach specifically designed for trauma (CBT-TTP) which involved teaching coping strategies, teaching vaccination against stress, exposure-therapy and cognitive reconstruction. They showed that this approach reduces the intensity of PTSD. Foa et al (1999) conducted a research and taught relaxation to 24 soldiers who suffered from PTSD. They showed that teaching relaxation reduces anxiety, depression after treatment and after six months follow-up test. However, sleep disorders and social isolation were not reduced significantly. Becker et al (2004) showed that exposure treatment method is an effective method. Results of two studies concerning the influence of treating PTSD patients showed that activation of fear network or emotional involvement have relationship with successful psychotherapy. Foa, Rigs, Messi and Yarkzour (1995) found that patients who expressed more severe fears in the first session of treatment benefited more from treatment than those who had less seere fears and patients who had reported more anger before treatment benefited more from treatment than those patients who had less anger.

Now the question is that which method's effectiveness is more? EMDR or CBT? Contradictory results have been found in previous studies in this regard. Devilly and Spence (1999) compared the efficiency of EMDR with TTP method in treating PTSD. They concluded that CBT-TTP method is more effective clinically and statistically in posttest and 3-month follow-up than EMDR.

In contrast, Rogers et al (1999) conducted a research and showed that the group which received EMDR were treated better than hegroup which received exposure. Further, Rotbam (1997) showed that EMDR method has more rapid treatment effects than exposure. Ironson study (2002) showed that EMDR is more efficient than CBT. Further, Lipki (1994) conducted a study on 445 experts who had treated more than 10 thousand patients. They showed that 76% of them preferred positive influences of EMDR method to other methods and only 4% of them reported positive influences of EMDR method. Shapiro (2002) showed that PTSD treatment through EMDR method is more effective than other methods. Lea et al (1995) showed that CBT-TTP method is more effective than EMDR method clinically and statistically in posttest and 3-month follow-up test. Sprang (2001) found that EMDR is more effective than CBT method in treating morning symptoms. Van Etten and Taylor (1998) showed that behavior-therapy and EMDR are more effective than medicine-therapy in treating PTSD symptoms and EMDR is more effective than other methods of behavior-therapy.

Considering the above discussion, now the question is that whether use of EMDR and CBT methods influence on treating PTSD and which method's effectiveness is more?

2 METHODOLOGY

The present research is an experimental study. Its plan has pretest-posttest with a control group. Statistical population of the present research included 400 injured war combatants who

referred to military clinics. Sample size included 200 people who were randomly selected to answer PCL questionnaire. 80 people acquired points higher than cut point (50). 45 people of these 80 people were randomly selected and put into 3 groups: two experiment groups and one control group. Respondents of experiment groups received 8 sessions of CBT and 8 sessions of EMDR and then they were post-tested. Data was analyzed by means of covariance analysis (ANCOVA) and using SPSS.

Intervention methods:

a) CBT was conducted in 8 90-minute sessions over 2.5 months. Steps of conduction of CBT included:

Summary of the first session: a combination of Socratic dialogue method and spiritual training, motivation inspiration, and recognition of physiologic processes of thinking and feeling.

Summary of the second session: aims of this session included acquiring awareness of main cognitive dimensions of post-traumatic stress disorder, cognitive manipulations, depression and self-motivated thoughts characteristics.

Summary of the third session: familiarization of participants with the fact that their thoughts follow behavioral and excitement outcomes and they may be inefficient.

Summary of the fourth session: this session aimed to familiarize respondents with vertical arrow in order to identify negative schemes.

Summary of the fifth session: familiarization of respondents with negative beliefs, and the relationships among beliefs, self-motivated thoughts and preparation of a list of beliefs, cognitive maps and….

Summary of the sixth sense: this session aimed to make respondents understand beliefs and the fact that they are not unchangeable and individuals can change their beliefs as time goes by.

Summary of the seventh session: this session included profitability analysis, logical analysis and practices concerning each one.

Summary of the eighth session: summation and problem-solving, receiving feedback from all individuals on presentations and … .

Criteria for investigating the patients included: diagnosis of post-traumatic stress disorder in I axis, not suffering from other personality disorders, bi-polar disorders, fundamental depression and traces of psychosis, minimum education should have been grade 3 in secondary school. Patients who were suffering each of the mentioned disorders, took medicine or received any other intervention were eliminated from the study.

b) EMDR was conducted in 8 90-minute sessions over 2.5 months. Steps of conduction of EMDR included:

First step: asking patients' background and designing therapy.

Second step: this step included preparation in which EMDR theory is explained for the patient and the patient develops some expectations for treatment and becomes ready for possible worries during sessions.

Third step: this stage is evaluation step in which goals and line-based responses are determined and patient makes statements on individual unhappiness scales and validity.

Fourth step: it involves desensitization which targets annoying excitements of the patient.

Fifth step: this step concentrates on reconstruction and cognitive reprocessing.

Sixth step: this step deals with evaluation of the remaining physical tensions and evaluation of them. This stage is called "physical scanning" .

Seventh hypothesis: ending or closing step. It is a step which involves mutual reporting and it is designed usually for maintaining the patient's equilibrium in sessions. The last step (eighth step) is called re-evaluation step.

Research data collection means:

In the present research, post traumatic checklist (pcl) was used to measure symptoms of post-traumatic stress disorder.

Post-traumatic stress disorder scale:

Post-traumatic stress disorder scale is a self-reporting scale which is used for evaluation of disorder and differentiating such patients from normal people and other patients as an aid to diagnosis. Validity and reliability of this scale were verified in Iran by Goudarzi (2003) in Shiraz University. Cronbach's alpha was calculated to be 0.93 for 117 respondents in his research. Validity of this scale was verified by means of bisection method. Validity coefficient was 0.87 (n=117) in his research. In order to present an index for validity of this scale, its correlation was calculated using life events list. The correlation coefficient was equal to (r=0.37, n=17, p=0.0001) which is acceptable.

3 Results

In order to test the hypotheses, means difference of pretest and posttest in the two experiment groups and in control group were investigated for "stress disorder" variable by means of covariance analysis (ANCOVA). Before conducting covariance analysis, the following assumptions were considered:

* Presence of a linear relationship between auxiliary random variable and dependent variable
* Assumption of slopes homogeneity (regression)
* Variances equality assumption

Investigation of the above condition showed that covariance analysis test can be conducted.

TABLE 1
MEAN AND ADJUSTED MEAN AND STANDARD DEVIATION FOR DEPENDENT VARIABLE (STRESS DISORDER)

source	pretest		posttest	
	M	SD	M	SD
EMDR	20.40	9.038	22.092a	.664
CBT	26.93	8.860	26.468a	.661
control	33.67	12.810	32.440a	.662

As it can be seen in table 1, the greatest stress disorder

mean belongs to control group and after that, it belongs to CBT and the lowest mean for stress disorder belongs to EMDR group.

TABLE 2
THE MEAN AND SD OF CRITICAL THINKING SUMMARY OF COVARIANCE ANALYSIS FOR STRESS DISORDER IN EXPERIMENT AND CONTROL GROUPS AFTER ELIMINATION OF MUTUAL IMPACT

scale	source	SS	df	MS	f	p	Eta
Stress disorder	**pretreststress disorder**	**4271.47**	**1**	**4271.46**	**652.50**	**.000**	**.941**
	Between groups	**798.18**	**2**	**399.09**	**60.96**	**.000**	**.748**
	Within groups	**268.38**	**41**	**6.54**			
	total	**38665.00**	**45**				

Data in table 2 shows that F ratio is statistically significant (F(2, 41)=60.964, p=0.000, Eta=0.748). this shows that there is a difference between three groups impact. In other words, there is significant difference between the two experiment methods and control group in reducing stress. Since F is statistically significant, post hoc test should be used. For this, two-by-two comparison test was used under the name of Custom Hypothesis using matrix command. Bonferroni's method was used for investigation of significance level of these tests and the results are summarized in table 3.

TABLE 3
TWO-BY-TWO COMPARISON OF POSTTEST MEANS FOR POST-TRAUMATIC STRESS DISORDER IN THREE GROUPS OF EMDR, CBT AND CONTROL

groups	Mean difference	P
CBT and EMDR	**4.917**	**0.000**
Control and CBT	**5.655**	**0.000**
Control and EMDR	**14.917**	**0.000**

Figures of the above table show that there is significant difference between mean of posttest of the three groups (CBT, EMDR and control groups) for post-traumatic stress disorder. The differences can be explained as follows:

1. There is a significant difference between the mean of post-traumatic stress disorder in EMDR group and CBT group. This difference is in favor of EMDR.
2. There is significant difference between the mean of post-traumatic stress disorder in control group and EMDR group and this difference is in favor of EMDR.
3. There is a significant difference between the mean of post-traumatic stress disorder in control group and CBT group. This difference is in favor of CBT.

Therefore, it can be concluded that both EMDR and CBT methods influence on post-traumatic stress disorder. EMDR method is more effective than CBT method considering (Eta=0.941).

4 CONCLUSION AND DISCUSSION

Results showed that there is difference between the influence of desensitization through eye movement and reprocessing (EMDR) and cognitive-behavioral therapy (CBT) on reducing post-traumatic stress disorder. Therefore, it can be concluded that both methods are effective and EMDR method is more effective.

This matches the results of studies conducted by Rogers et al (1999), Rotbam (1997), Ernson (2002), Lipki (1994), Shapiro (2002), Li et al (1995), Spring (2001), Wanton and Taylor (1998). In contrast, this result does not match the results of studies conducted by Devilly and Spence (1999). They showed that CBT is more effective than EMDR method both clinically and statistically.

These results match the results of studies conducted by Narimani and Rajabi (2009), Sidler and Wagner (2006). The results can be explained in this way that because the war injured who suffer this disorder have problems in physiologic, behavioral and cognitive dimensions and because CBT method deals with cognitive and behavioral dimensions of the injured and EMDR method deals with physiologic parts and war scenes flashbacks, continuous use of these two methods was helpful and improved the injured psychologically. Furthermore, there is a difference between post-traumatic stress disorder mean of the control group and mean of post-traumatic stress disorder for EMDR group. It was verified that EMDR method is effective in reducing post-traumatic stress disorder symptoms. Researchers believe that EMDR is effective in reducing stress disorder resulted from traumas like war, flood, earthquake, driving, bombardment, horror or living in war captivescamps and individuals who suffer from post-traumatic stress disor-

der express considerable reduction in post-traumatic stress disorder symptoms (Hawton, 1984).

Further, results showed that there is significant difference between PTSD mean point in control group and experiment group. In other words, CBT method is effective on reducing PTSD.

This matches the results of studies conducted by Rothbaum (1997), Taylor and Van Etten (1998), Cusack and Spates (1999), Macklin et al (2000), Schneider et al (1995), Shapiro (1998), Pock (1991), Welpi and Abramz (1991), Policer (1993), Carlson et al (1998), Wougan et al (1994), Shneiderman et al (2005).

It can be said that EMDR method emphasizes on facilitation of cerebral self-curing mechanism through disconnecting former links and neurophysiologic networks concerning the related memory. Moreover, its medical results take place in the short time. This is concordant with rapid process of information based upon Lang theory. In fact, rapid influences of EMDR are justifiable in the present research. Furthermore, in EMDR method, patients are encouraged to pay attention to details of negative thinking.

The above result matches the results of studies conducted by Foa et al (1991), Weine et al (1998), trarier et al (1999), Triffman et al (1999), Foa et al (1999), Becker et al (2004), Foa et al (1995). It shows that psychological problems are created as a result of our evaluation of situations, thoughts, feelings and behaviors.

In CBT method, the concepts are stated in operational manner and validation of treatment is conducted empirically. In this kind of treatment method, patient is helped to identify his/her inefficient and faulty thinking models. In order to be able to do this, regular discussions and organized behavioral assignments are used. In some aspects of treatment, the emphasis is usually behavioral and in some other aspects, it is cognitive. A large part of the treatment is conducted based upon "now/here approach" and it is assumed that the main goal of treatment is helping the patient with changing his/her life positively. Therefore, the treatment is focused mainly on providing opportunity for learning and changing clinical aspects. All aspects of treatment are explained for the patient and both therapist and patient try to establish a mutual relationship with each other and find strategies for solving issues. This approach is mainly based upon self-help and therapist tries to help patient with solving present and future problems. Therapist should emphasize that a large part of the treatment is conducted in daily life. In other words, the patient should put whatever is discussed in treatment sessions into action. The patient is expected to take part actively in treatment process by giving feedback on treatment techniques and recommending new strategies. Information should be given to treatment structure on treatment structure: like the number of treatment sessions and sessions holding place and treatment length (Hawton et al, 1984).

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