Comparison the effectiveness of "cognitive-behavioral" and "eye movement desensitization reprocessing" treatment models on patients with war post-traumatic stress disorder

Ahmadizadeh M. J. PhD, Eskandari H. PhD, Falsafinejad M. R. PhD, Borjali A. PhD

*Department of Clinical & General Psychology, Faculty of Psychology & Educational Sciences, Allameh Tabatabaei University, Tehran, Iran;
1Department of Clinical & General Psychology, Faculty of Psychology & Educational Sciences, Allameh Tabatabaei University, Tehran, Iran;
2Department of Assessment & Measuring, Faculty of Psychology & Educational Sciences, Allameh Tabatabaei University, Tehran, Iran

Abstract
Aims: Post Traumatic Stress Disorder (PTSD) is an anxiety disorder which can develop after exposure to any event which results in psychological trauma. Cognitive-Behavioral Therapy (CBT) is the most commonly used treatment for the disease and Eye Movement Desensitization and Reprocessing (EMDR) is a more rapid, relatively recent method. This study was designed with the aim of comparing the efficacy of Cognitive-Behavioral Therapy and Eye Movement Desensitization and Reprocessing method on reduction of specific symptoms and recovery in patients suffering from PTSD due to war.

Methods: This experimental study was performed in year 2008. 45 veterans suffering from PTSD were divided randomly into three CBT, EMDR and control groups. Each of the mentioned groups contained 15 members. Two questionnaires including PTSD checklist-military version and symptom checklist 90 revised were applied in order to collect data. Data was analyzed using inferential statistical tests by SPSS 16.

Results: Scores of CBT group and EMDR group had a significant difference from control group scores.

Conclusion: Both models are effective on reduction of symptoms in PTSD.

Keywords: Post Traumatic Stress Disorder (PTSD), Cognitive-Behavioral Therapy (CBT), Eye Movement Desensitization & Reprocessing (EMDR)

Introduction
In spite of passing two decades since the end of the war, still a large number of mental veterans are seeking to recover their lost health by frequent visits to the health centers. The Passage of time, patients’ aging and the lack of a comprehensive treatment has caused the exacerbation of their symptoms and problems. The conducted studies on the long-term effects of war on the psychosocial status of the mental veteran indicated that passage of time is not in favor of patients’ recovery, because not only it reduces the social support but also the symptoms of the disease especially symptoms like the sudden reactions, nightmares and provocation in them will be exacerbated by age [1].

According to DSMIV-TR (Diagnostic and Statistical Manual of Mental Disorder; Fourth Edition, Text Review), Post Traumatic Stress Disorder (PTSD) is a kind of anxiety disorder which is usually developed after the exposure to any damaging event which results in psychological trauma. These events may be the severe car accidents, natural disasters such as flood and earthquake, wars or being victim in the sexual and physical invasions and assaults. The distinguishing characteristics of this disorder are the recurrence of the symptoms, the experience of the damaging event through dreams and thoughts in sleep and wakefulness, avoiding recalling the accident and reduction of the total responding [2].

The Cognitive-Behavioral Therapy (CBT) is one of the most common methods of the cognitive psychotherapy. Eye Movement Desensitization and Reprocessing (EMDR) is also known as one of the relatively new and rapid cognitive psychotherapy for PTSD.

EMDR Treatment Method: the conducted studies about the therapeutic effects of EMDR to treat PTSD as an effective method of treating mental disorders includes a series of standard protocols composed of joining various factors of treatment methods such as confrontation-therapy, cognitive- therapy, hypnosis, and information processing [3]. Principles and theoretical approach of EMDR treatment method are based on the adaptation and information processing models.

According to Shapiro in describing the EMDR neuro cognitive mechanism, one of the simplest ways to describe the EMDR coherence effects is the fact that the damaging accident has remained with no
processing, because immediate biological responses to mental damage has left it in a static neurological status. In physiological terms, EMDR processing mechanism is formed in a way that can deliver unprocessed information to an adaptive level. The proposed hypothesis about the EMDR underlying mechanism are the experimental findings in the field of Limbic System, neurobiology, mental injury or impact, and sleep in the rapid eye movement phase [4].

The treatment process in this method is relatively faster than traditional psychological treatments. Patient imagines a situation similar to the incident causing injury (like watching a terrible car accident), while keeping this image in the mind follows the therapist finger by the eyes. This process will be continued for one minute or more, or until the patient declares that the annoyance of the image has been reduced. The general idea is that when the patient is in deep relaxation, he/she can cognitively reconstruct the event causing damage and thereby eliminates his/her symptoms. Then the therapist asks the patient to explain all the negative thoughts which he/she is browsing in his/her mind and encourages the patient to think about positive thoughts (e.g. I can handle it”) while following the moves of his finger, and thinks about this image until he/she is following the finger. This treatment contains eight steps which have been formed of the combination of both confrontation and cognitive- therapy. The number of sessions devoted to each step and the time of each session are different according to the state of applicant and the severity of damage which vary from 60 to 90 minutes [5, 6].

**CBT treatment method:** the effectiveness of the CBT treatment on reducing symptoms of patients with PTSD made this method nowadays the first therapeutic way of PTSD. The patients with severe mental illness having suicidal ideation and psychological symptoms of aphasia can also benefit from this type of treatment [7, 8].

First of all in this method, the patients learn how to cope with the emotions and stress accompany with memories by using some methods of relaxation and pain relief. Then the therapist helps the patient to face with these memories until the patient redefines the story that happened. The more he/she does it, the less he/she feels uncomfortable about the memories and the more he/she feels relaxed. Finally, the therapist teaches the patient some methods that will change the patient’s negative thoughts and will reorganize his/her life.

although separate studies have been done using the CBT and EMDR techniques in different classes and population, but according to the topics, questions and purpose of the research, using these two methods of the direct intervention and investigating their effects on the mental status of the patients with war-induced PTSD, in a regular and documented plan, not only evaluate the effects of these two treatment methods on reduction of the specific symptoms, recovery and reducing symptoms of other mental disorders coexisting with this disorder but also could be an effective step in the recovery in patients by increasing personal effectiveness in dealing with stressful life events.

The main purpose of this study was to determine the effectiveness of each treatment method of CBT and EMDR separately on reduction of the specific symptoms and recovery in patients with PTSD.

**Methods**

This is an experimental study conducted in 2008. Using a quasi-experimental design, 45 veterans suffering from PTSD caused by the war were randomly selected as the subjects of this study. Subjects were randomly divided into three group CBT, EMDR and control groups. Each group contained 15 subjects.

Exclusion criteria from the study included major mental disorders except PTSD, personality disorders, addiction to drugs and alcohol, educational level lower than high school, participation in any mental health sessions simultaneously or participation in the treatment programs (CBT and EMDR ) which were considered via the records of patients.

The stages of this study included: first, pre-test was implemented for both case and control groups. Then, after the implementation of intervention methods of CBT and EMDR in case group, the post-test was implemented to both case and control groups. The treatment stages for the CBT group were implemented in eleven individually and group sessions, and for EMDR group in four individually sessions that the full descriptions are given in Tables 1 and 2 [5, 6, 9]. But no treatment program was run for the control group.

Before implementing the pilot phase to evaluate the operational problems of the research and the used instruments, the plan was conducted on five subjects as the case group. The obtained results of the implemented method in this stage were used for planning the main operational method of this research.

A) Checklist of post traumatic stress disorder - a military version (PCL-M): This checklist was self-report scale which was used to evaluate the severity of
disorder and separating these patients from normal individuals and other patients as a co-diagnostic instrument. The advantage of this checklist was that it was brief and short. The time was approximately 10 minutes. The limitation of this checklist was that it was validated only on the military forces.

<table>
<thead>
<tr>
<th>Sessions</th>
<th>Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>First</td>
<td>Introducing the treatment and implemented arrangements</td>
</tr>
</tbody>
</table>
| Second   | 1- Focus on skill training of problem-solving  
2- Definition and classification of formula and production of alternative solutions |
| Third    | Finding the value of the produced solution |
| Fourth   | Decision making |
| Fifth    | Proving and reviewing the process of problem-solving |
| Sixth    | Investigating the problems of each patient based on the process of problem solving |
| Seventh  | Emphasizing on personal problems, definitions and classification of formula |
| Eighth   | Finding the value of the presented solutions |
| Ninth    | Finding the value of the presented solutions |
| Tenth    | Proof Stage |
| Eleventh | End of the treatment |

This checklist was prepared by Weathers, Litz, Herman, Kane, Huska, and Keane based on DSM diagnostic criteria for the National Center of Post-Traumatic Stress Disorder after U.S shock. It was included 17 articles which five article were about re-experience signs and symptoms of the stressor event (criterion B), 7 articles about emotional symptoms and avoidance (criterion C) and 5 articles about signs and symptoms of the severe arousal (criterion D) [10].

B) Checklist of mental disorders (SCL-90-R): the revised version of SCL-90-R was one of the most common instruments of self-report for assessing psychopathological damage. This instrument was specifically made to measure those physical and psychological problems that patients had recently experienced. 90 articles of this scale describe some symptoms that the mental and medical patients had experienced and reported a lot.

Each question of the questionnaire consists of a 5-degree spectrum of problem severity which is from zero (none) to 4 (severely). The questions of questionnaire were included 9 different parts including complaint of physical illness, paranoid ideation and aphasia [11].

C) Questionnaire of the personal information: this questionnaire was made by the researcher and was prepared in order to collect personal information of subjects including age, education, sex, occupation, marital status, number of children, residence, percentage of veterans, financial and economic conditions, previously performed treatments, physicians, and patients' cooperation and the way of participation in the sessions and suggestions on cooperation.

<table>
<thead>
<tr>
<th>Sessions</th>
<th>Title</th>
<th>Main activities</th>
</tr>
</thead>
</table>
| First    | Introducing treatment and preliminary measures of the planning | 1- Introduction of the therapist and patients and providing relation  
2- Brief introduction of treatment  
3- Expressing the expectations and the way of patients’ participation in treatment by the therapist  
4- Implementation of the pre-test questionnaires  
5- Getting the patient records and making it ready |
| Second   | Evaluation | 1- Introduction of the therapist and patients and providing relation  
2- Brief introduction of treatment  
3- Expressing the expectations and way of patients’ participation in treatment by the therapist  
4- Implementation of the pre-test questionnaires  
5- Getting the patient records and making it ready |
| Third    | Cognitive reconstruction | 1- Applying  
2- Surveying and paying attention to physical problems |
| Fourth   | Evaluation of the treatment process | 1- Final step  
2- Re-evaluation  
4- Implementation of post-test and evaluation of patients’ status |

Ethical considerations were observed including voluntary participation in this study, presentation of required information regarding implementation of the research, confidentiality of the obtained information from the subjects, refusal of planning unnecessary and personal questions, lack of recording unnecessary information and giving code to each subject of this study.

Random replacement of subjects in all groups was done in order to control the distracting variable of the past and current treatment. Data was analyzed using inferential statistics Chi-square, one-way ANOVA with the frequent evaluation, comparison of independent and correlated mean of T test and Tukey’s post hoc test by using SPSS 16.

Results
The mean age of subjects was 45.07±4.58 years old.
Comparison the effectiveness of “cognitive-behavioral” and “eye movement desensitization reprocessing”

and was at the age range of 37-55 years old. Regarding the educational status, 55.6% had diploma, 13.3% had associate degree, 22.20% had B.A, and 8.9% had MA. Their veterans status was varied from the range of 20 to 55% and most subjects (62.2%) were in the range of 26 to 45%. All subjects were married. Regarding the number of children, it was varied from no child to five children, and most of them (68%) were in the range of 2 to 3 children. Regarding the employment status, 34 subjects (75.6%) were military, 7 subjects (15.6%) were equipped in other public and private agencies in and 4 subjects (8.8%) were retired.

There was no statistically significant difference between groups in terms of education, age, occupation, the percentage of veterans and distribution of subjects. Therefore, it could be said that the studied groups were similar.

There was a significant difference between the CBT and EMDR methods in reducing the specific symptoms of PTSD in the pre-test and post-test (p<0.001), but there was no significant difference in reducing the symptoms of other psychiatric disorders (p>0.05; Table 3).

Table3- Comparing the effect of CBT and EMDR methods on the reduction of specialized symptoms of PTSD and the other accompanying psychological disorders

| Test group | Groups Mean SD t value df Level of significance |
|------------|---------|--------|------------|---|----------------------------------|
| Pretest and posttest based on PCL | CBT 4.83 5.045 -4.409 28 0.001 | EMDR 17.87 10.308 |
| Pretest and posttest based on SCL.90 | CBT 0.57 0.599 | EMDR 0.93 0.653 -1.578 28 0.126 |

Table 4 - Comparing the groups under study in terms of their effect in the reduction of PTSD symptoms based on PCL-M

<table>
<thead>
<tr>
<th>Row Numbers</th>
<th>Groups</th>
<th>Mean</th>
<th>SD</th>
<th>F relative value</th>
<th>df</th>
<th>Level of significance HSD Tukey test</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>CBT 15</td>
<td>4.83</td>
<td>5.05</td>
<td>42 &amp; 0.001</td>
<td>1&lt;2 &amp; 3&lt;2</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>EMDR</td>
<td>17.87</td>
<td>10.31</td>
<td>21.783 &amp;</td>
<td>0.001</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Control</td>
<td>1.40</td>
<td>4.94</td>
<td>2</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Table 5 - Comparing the groups under study in terms of their effect in the reduction of the other accompanying psychotic disorders symptoms based on SCL-90-R

<table>
<thead>
<tr>
<th>Row Numbers</th>
<th>Groups</th>
<th>Mean</th>
<th>SD</th>
<th>F relative value</th>
<th>df</th>
<th>Level of significance HSD Tukey test</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>CBT 15</td>
<td>0.57</td>
<td>0.60</td>
<td>42 &amp; 0.001</td>
<td>3&lt;1 &amp; 3&lt;2</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>EMDR</td>
<td>0.93</td>
<td>0.65</td>
<td>8.351 &amp;</td>
<td>0.001</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Control</td>
<td>0.09</td>
<td>0.81</td>
<td>2</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Regarding the recovery in patients with PTSD in both case groups compared with the control group, there was a statistically significant difference between the three groups (p<0.001).

The results of comparison of the groups showed that the EMDR group was more effective than CBT and both case groups were more successful in reducing specific symptoms and other symptoms of mental PTSD associated disorders than control group (Tables 4 and 5).

Discussion

The results obtained from this study on the effectiveness of two treatment methods compared with the control group were consistent with the conducted studies by Bisson and Andrew [7], Jennings [8], Friedman [12], Taylor [13], Ahmadizadeh [14] and Aslani et al. [15] regarding the effectiveness of CBT treatment method on reducing symptoms and PTSD cure.

The results of this research about EMDR treatment method were also consistent with the studies by Shapiro, Kaslo, Hittiarachchi [16], Maxfield [17], Khalfa et al. [18] and Abbasnejad et al. [19] regarding the effectiveness of EMDR treatment method on reduction of symptoms and recovery in patients with PTSD.

The obtained studies showed that the patients of the CBT group by the benefit of cognitive-behavioral skills based on the shock learned that they could overcome the problems via the cognitive-reconstruction and reflection in providing answers and projection of the emotions during exposure with the damaging event and dealt with it properly. CBT method effects on reducing symptoms of self-punishment by facilitating and increasing the efficient and flexible coping skills that many studies emphasize on the effectiveness of CBT treatment method of mental health promotion and recovery in patients (especially patients with this disorder).

In this method, patients were taught how to think in dealing with the problems, not to think about what. This issue caused that the person would achieve to self-effectiveness in dealing with problems and would potentially have the necessary readiness to solve the problems.

Considering the obtained results of this research and the findings of the conducted studies which support the effectiveness of EMDR to treat PTSD, this treatment could be effective for recovery of the emotional shocks in the short term. It also seems that projection of emotions and negative excitement rather than repression and introjections of emotions and exposure and reconstruction of damage event could be
effective on the recovery of disorder. Overall, it can be concluded that despite achieving to the recovery and reduction of the specific symptoms of disorder in patients of both groups, in comparing both groups there was no significant difference between the effectiveness on other symptoms of psychiatric disorders, and the effectiveness of both treatment methods were similar. Thus, although both case groups were effective in reducing specific symptoms of disorders, it can be concluded that lack of a significant difference between the efficacies of these two treatment methods in reducing nonspecific symptoms of disorder could be due to being secondary to nonspecific symptoms compared with the specific symptoms of disorder. Consequently, secondary symptoms (which have probably common etiology) would be decreased by reducing the specific symptoms. The reason that EMDR treatment method was more efficient in reducing specific symptoms compared to CBT was probably because of the EMDR processing mechanism which in terms of physiology, it formed so that it could deliver the processed information to an adaptive level.

In this study, there were some problems and limitations due to some necessities and criteria of deleting the subjects (such as education lower high school, being single, non-war traumatic events). It is recommended to investigate the effectiveness of treatment methods in the further studies as well as removing the limitations of this study and taking advantage of the results of this research. The subjects encountered with different stress, such as natural disasters, accidents, victims of sexual invasion or violence and damaged people to other experiences of causing stress will be also used for further studies on the effect of treatment.

Conclusion
The results of this study showed that CBT and EMDR treatment methods were effective on reducing the specific symptoms of PSTD and other symptoms of the psychiatric disorders.

Acknowledgement: At the end, the researcher would like to appreciate esteemed colleague, Mr. J. Annisi due to his sincerest efforts, and Dr. Tolae and Dr. Noohi, Head of Department and Head of Psychology-medicine, Ms. Gholampour, responsible for psychology, psychotherapy doctors and Dr. Allahdad, responsible for the clinic at the time, who helped us in conducting this study.

References
4- Bergmann UR. Speculation on the neurobiology of EMDR.Traumatology, 1998;4:1-5.