

Comparison of Group Eye Movement Desensitization and Reprocessing with Cognitive and Behavioral Therapy Protocol after the 2020 Earthquake in Turkey: A Field Study in Children and Adolescents

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ABSTRACT

Objective: We aimed at comparing the efficiency of “Eye Movement Desensitization and Reprocessing Integrative Group Treatment Protocol (EMDR-IGTP)” with “Cognitive and Behavioral Therapy Based Crisis Prevention Program for Children and Adolescents (CIPCA)” in children who survived the 2020 earthquake in Turkey.

Methods: We randomly divided 56 children and adolescents who were earthquake victims between the ages of 8 and 14 into two groups. Half of the participants underwent EMDR-IGTP, while the other underwent CIPCA. Outcomes were obtained using clinical global impression (CGI) and the subjective units of distress (SUDS) scales before and after therapy.

Results: The median age of the participants was 10 years (range: 8–14) and 53.6% of them were male. The median CGI scores of the EMDR-IGTP group before and after therapy were 7 (3–7) and 1 (1–7), while that of the CIPCA group before and after therapy were 7 (3–7) and 4 (2–7), respectively ($p < 0.001$). The median SUDS scores of the EMDR-IGTP group before and after therapy were 10 (5–10) and 1 (0–10), while that of the CIPCA group before and after therapy were 9 (5–10) and 5.5 (3–9), respectively ($p < 0.001$).

Conclusion: Both EMDR-IGTP and CIPCA are effective in reducing the acute traumatic stress following the earthquake; however, EMDR-IGTP is relatively more effective. Thus, both methods can be used as a psychosocial intervention in post-earthquake traumatic events.

Keywords: Earthquake, EMDR, CBT, psychosocial intervention, group therapy, PTSD

INTRODUCTION

One of the most frightening natural disasters has been earthquakes since the existence of human beings. Earthquakes are natural events that affect thousands of people at the same time, thereby resulting in a change of daily routines and priorities. In such natural disasters, the primary needs are often eating, drinking, and sheltering. However, one issue that should not be left out is the need for psychological support (1). According to World Health Organization reports, psychiatric disorders such as mild and moderate depression, post-traumatic stress disorder (PTSD) or anxiety disorder occur in an average of 15%–20% of the affected population after a disaster; complex PTSD and high morbidity disorders such as severe depression and anxiety disorder (psychosis) occur in 3%–4% of them (2). When the number of people affected by the earthquake was taken into consideration, these

given rates can be considered significant enough to affect social functionality. In addition, previous studies reveal that early psychosocial interventions after disasters (earthquakes and violence attacks) are effective and can prevent future psychiatric disorders (3, 4). For this reason, psychosocial interventions have been developed for children and adolescents in order to preserve the mental health of the survivors. The protocols developed in this direction are short and established on the basis of previously proven therapeutic regimens, and are also suitable for application in groups. The most common methods used following natural disasters include Cognitive Behavioral Therapy (CBT), and Eye Movement Desensitization and Reprocessing (EMDR). CBT have developed protocols that can be applied in several sessions including techniques such as psychoeducation, emotion expression and modulation, cognitive reconstruction, creation of trauma stories, and management of dysfunctional behavior (5).

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Crisis Intervention Program for Children and Adolescents (CIPCA) is a CBT-based intervention developed for this purpose. CIPCA has been shown to reduce symptoms of trauma in a study undertaken in internally displaced children and adolescents caused by war in Iraq (6). EMDR is based on bilateral stimulation while clients' imaging the bad part of the target event. This method is effective especially in reducing the distress caused by traumatic experiences (7, 8). EMDR-based applications have been developed for use after crisis and disasters (9). EMDR-IGTP was used in the study conducted by Tirentini et al. (10) after the 2016 Italy Earthquake. Moreover, we recorded a greater improvement in children who had received a timelier intervention, compared to those with delayed treatment in this study.

In this study, we aimed at demonstrating the effectiveness of EMDR-IGTP and CIPCA protocols in trauma-related symptoms in children and adolescents who survived the earthquake, which occurred on January 24, 2020 in Turkey's Elazig province and lasted about 40 seconds, and the epicenter of which is Sivrice and violence of which is 6.8.

METHODS

This is a pre/post study with a control group. Three weeks after the earthquake in Elazig, during February 15–17, children and adolescents staying in tents because their house was destroyed or damaged were voluntarily visited. We invited 60 participants for the study. However, three children did not want to participate in the study, and one child stopped working due to intense anxiety during EMDR-IGTP intervention. As a result, 56 people were included in the pre-post analysis. Half of children and adolescents between the ages of 8 and 14 interviewed during this visit were applied EMDR-IGTP and the other half were applied CIPCA. In both groups, there were three applications including 10, 9, 9 children/adolescent in each. After determining the groups, therapeutic method was chosen randomly. The application of protocols in each group took about an hour. Psychotherapy applications in both groups were performed by a child and adolescent psychiatrist, who was trained in professional field and had field study permits. In addition, Informed Consent Form was signed by families and child-adolescents before therapeutic applications. Approval was obtained from Gaziantep University Ethics Committee for this study (Date: 02.04.2020, Number: 2020/135) In order to evaluate the effectiveness of treatment methods before and after the therapy, an instruction was given to children/

adolescents such as "when you think about the earthquake moment, if you score the level of discomfort it creates in you, how many points do you give from 0 to 10 (0 is none ... 10 is too much)?" The assessments before and after therapy were based on the clinical Global impression (CGI) and the subjective units distress (SUDS) scales. Children and adolescents whose psychological problems continue are referred to the child and adolescent psychiatry outpatient departments in Elazig for individual treatment.

Clinical Global Impression Scale

CGI is a measurement tool that evaluates the severity of any disease as well as improvement of its symptoms. The clinician uses the scale, in the light of his knowledge and experience about the disease, on a Likert type rating ranging from 1 to 7 (1- normal, not patient, 2- borderline patient, 3- mild patient, 4- moderately ill, 5- prominently ill, 6- advanced, 7- most advanced) (11).

Subjective Units Distress Scale

SUDS is a qualitative assessment tool with a value within 0–10 to determine the subjective distress of clients in psychotherapies: "0" does not feel any distress; 10 indicates the highest level of distress felt. As the number increases, the level of distress felt increases as well (12).

Statistical Analysis

IBM SPSS Statistics 23 program was used for data analysis (IBM SPSS Corp.; Armonk, NY, USA). As descriptive statistics; median (min–max) values for continuous variables, frequency and percentages for qualitative variables were given. The normality of continuous variables was evaluated by Kolmogorov–Smirnov test. For group comparisons; Mann–Whitney U test was used in comparing continuous variables and chi-square test for qualitative variables. For pre-post comparisons within groups, Wilcoxon signed-rank test was used. P-values less than 0.05 was considered as statistically significant.

Eye Movement Desensitization and Reprocessing Integrative Group Treatment Protocol for Children [EMDR-IGTP] (13)

EMDR-IGTP was developed by the Mental Health Support Association in 1997 after Hurricane Pauline, in order to be implemented in the Mexico Crises. This model was first created by combining standard EMDR protocols developed by Francine Shapiro and group therapy protocols (14). It is suggested that EMDR-IGTP could be a treatment alternative in crises where there are many individuals who need to be reached in a short time (15). In our study, EMDR-IGTP for children was applied as a protocol consisting of eight stages in the place of the original protocol. The stages are listed below.

Stage 1, Client Story and Treatment Planning: At this stage, the therapist collected detailed medical and psychiatric history of children and adolescents who were victims of the earthquake, and organized treatment for them.

Stage 2, Preparation Stage: At this stage, the therapist explained trauma, PTSD, and their effects on child adolescents. Then, a warming technique was applied to attract the attention of the

Main Points:

- Individual psychotherapy might not be possible in such events where large masses are affected. Therefore, the role of psychosocial interventions in groups is very important.
- In this study, we applied the group protocols of the two most important psychotherapy models (EMDR and Cognitive Behavioral Therapy (CBT)) that can be used in traumatic events.
- We found that both protocols are effective in improving traumatic effects in children.
- EMDR is more effective than CBT for acute stress disorder after earthquake.

group members and increase their harmony. In order to make it easier for them to recognize their own emotions, they were asked to imitate their “happy/sad/scared/surprised/angry” emojis, and to recognize these emotions by thinking about some of the events that they experienced in the past. Then, abdominal breathing technique was taught. Moreover, they were taught the Butterfly Hug technique (14). By means of the latter, individuals gained the ability to make two-way stimulation by themselves. The therapist then said “Close your eyes, move your hands diagonally to your shoulders and move them like a butterfly flapping. Breathe deeply and slowly while trying to recognize all the changes in your mind and body such as thoughts, images, sounds, smells, emotions, and sensations. You can be as comfortable as if you are moving above the clouds” and encouraged them to combine Butterfly Hugging with abdominal breathing. After these steps, he said, “Now, please close your eyes, and imagine you are in a place where you feel safe or calm.” Then he gave the following instruction “draw this Safe/Quiet Place on the A4 paper in front of you.” He made the Safe/Calm Place placement with the “Now focus on what you see in your Safe/Calm Place, smells, sounds, and do Butterfly Hugging 6–8 times slowly” instruction. It was stated that individuals with satisfactory feelings after the study could take the Safe/Calm Place study with them and implement whenever they want, while going to the next stage.

Stage 3, Evaluation: They were asked to divide an A4 sheet of paper by four. Each part was named with the letters A, B, C, D. In addition, they were asked to consider the worst part of the earthquake event they experienced in a similar way to the standard EMDR protocol. Then, they were asked to draw this part of the event on part A on A4 paper. They were then asked to look at the paper and score the distress felt between 0 and 10 (SUDS).

Stage 4, Desensitization: At this stage, participants were asked to drop their pens, and do Butterfly Hug for about 60 seconds, while looking at what they drew. After the Hug, the “Try to notice how you feel, and draw whatever you want to draw on part B” instruction was given. Moreover, they were asked to re-score their distress as they looked at their drawings (SUDS). Again, they were asked to drop their pens, and do Butterfly Hug for about 60 seconds. The same process was repeated for parts C and D. This stage was completed following scoring SUDS for the last time.

Stage 5, Vision for the future: At this stage, they were told to draw/write whatever they wanted about how they visualize themselves in the future. After the drawing was completed, placement was done with a Butterfly Hug.

Stage 6, Body scan: “Think about the event and scan your body thoroughly. If there is any discomfort, do a butterfly hug” instruction was given.

Stage 7, Closing: The following instruction was given: “Close your eyes, remember your safe/calm place and do a butterfly hug for about 60 seconds. Then, take three deep breaths and open your eyes.”

Stage 8, Reassessment and follow-up: At the end of the group intervention, the therapist determined the children who needed more help. The therapist then directed participants in need for individual interventions.

Crisis Prevention Program for Children and Adolescents (CIPCA) (16)

This intervention was developed by Metin Health House for early intervention in children and adolescents with post-traumatic psychopathology. It was first used in children and adolescents who were forced to migrate, and started being used to prevent other post-traumatic psychopathologies. In this study, the questions were revised, in accordance to the original, for the earthquake. This method is a time and cost effective application. It can be applied with 10–30 children and adolescents, and each application takes an average of one hour. The group leader follows the crisis intervention guide and performs the application. The purpose of this method is to help children and adolescents play an active role in verbalizing their negative feelings and thoughts, and supporting them to create positive emotions instead. CIPCA is a semi-structured interview covering several models such as information, group therapy, cognitive reconstruction, systemic theory, attachment theory, salutogenesis, and post-traumatic growth. During the application, the group leader asked the children and adolescents 12 questions in the Crisis Expression Guideline and waits for them to express themselves. After the questions, those who still had a high level of distress were referred to child and adolescent psychiatry outpatient clinics in health institutions to undergo individual interventions.

RESULTS

We included 56 children in the study. There were 15 (53.6%) males and 13 (46.4%) females in each group. The average age of EMDR-IGTP group was 10.3 years (±2.02), and the average age of CIPCA group was 10.4 years (±2.09). There was no significant difference between the groups in terms of gender and age (p=1.000, p=0.940, respectively). (Table 1)

There was no significant difference between SUDS levels across both groups before the therapy (p=0.485). When the changes within groups are examined, both methods provided a significant improvement in SUDS level of the children (p<0.001). The median level of SUDS of the EMDR-IGTP group after therapy was found to be 1 (min:0–max:10) and the CIPCA group was 5.5 (min:3–max:9). It was found that both applications decreased the SUDS level after the earthquake, and EMDR-IGTP decreased relatively more. Similarly, there was no significant difference between CGI severity of both groups before the therapy (p=0.831).

Table 1. Gender and age comparison of groups

		EMDR	CIPCA	p
Gender	Boy n (%)	15 (54%)	15 (54%)	1.000
	Girl n (%)	13 (46%)	13 (46%)	
Age*		10 (8–14)	10 (8–14)	0.940

*The data are shown as median(min–max).

Table 2. Comparison of pre- and post-therapy SUD and CGI scoring

	Pre-therapy	Post-therapy	P**
CGI scores			
EMDR	7 (3–7)	1 (1–7)	<0.001
CIPCA	7 (3–7)	4 (2–7)	<0.001
P*	0.831	<0.001	
SUD scores			
EMDR	10 (5–10)	1 (0–10)	<0.001
CIPCA	9 (5–10)	5.5 (3–9)	<0.001
P*	0.485	<0.001	

* Between-group comparison, **Within-group pre-post comparison

*** The data are shown as median(min–max).

Nevertheless, it was found that there was a significant difference between the two groups with respect to the CGI values. The improvement rate was higher in the EMDR-IGTP group. There was a significant decrease in CGI severity after both group underwent therapies ($p < 0.001$). (Table 2)

DISCUSSION

In our study, EMDR-IGTP and CIPCA has been applied to children who survived the earthquake in Turkey's Elazig province. As a result, it was concluded that both groups benefited from these psychosocial interventions, and the level of improvement in the EMDR-IGTP group was higher than the other group.

In a study using CBT-based group intervention, CBT was shown to be more effective than the general supportive intervention and controls adolescents who lost their parents in the earthquake, in increasing psychological resistance, and decreasing the symptoms of PTSD and Depression (17). Our research supports these findings, as there was a significant decrease in SUDS level before and after treatment. CBT-based early intervention protocols have been used not only in natural disasters but also in war-related traumas. In a study with Congolese young people, Trauma Focused CBT group, a non-trauma based psychosocial intervention (Child Friendly Spaces) group and waiting list group were compared (18). In the pretest, post-test, and 6th month follow-up evaluation, both methods reduce depressive symptoms and behavioral problems better than the waiting list. Psychosocial interventions based on CBT are also effective in minimizing emotional problems (19). Although the effectiveness of CBT-based CIPCA used in our study has been shown in children suffering from war and migration, it has been used for the first time in earthquake-related trauma, and is thought to be effective in reducing trauma-related symptoms.

In our study, in the pre-post comparison of the group that applied EMDR-IGTP, the level of SUDS decreased significantly. Findings consistent with ours have been demonstrated in both field and pilot studies (15, 20). Despite similar basis, there are differ-

ent group EMDR applications other than EMDR-IGTP. In another study conducted in Taiwanese adolescents, another EMDR-based group application was used and was shown to be effective (21). Proudlock et al. (22) suggest that EMDR could be an effective treatment for patients experiencing a mental health crisis having a trauma picture, resulting in significant improvements in their mental well-being and substantial cost savings for the National Health Service.

According to our findings, EMDR-IGTP application is more effective than CIPCA. In the meta-analysis conducted in 2017 including 36 studies, CBT, EMDR, narrative exposure therapy for children and school-based applications were compared. All therapy models are effective compared to controls and can be recommended as a psychosocial intervention after disaster. However, the methods with the highest effect size proved to be CBT ($d=1.25$), exposure therapy ($d=1.56$) and EMDR ($d=2.15$) (3). These results correspond exactly to our study. There are also studies with different results in terms of effect size. In a study conducted after the 1999 Athens earthquake, CBT-based group intervention was used and the effect size of the method was found to be 3.74. Differences between the effect sizes of the studies were affected from the professionalism and the level of education of the practitioner (23).

CONCLUSION

We encountered some limitations in our study. First, a structured questionnaire was not used and only the pre-post results were included. In addition, small sample size can be considered as a limitation. In order to make more accurate judgments about how much therapies improve functionality, long-term follow-up studies with larger sample sizes are required. In summary, both EMDR-IGTP and CIPCA are effective (but EMDR-IGTP is more effective) in reducing the acute stress problem in children and adolescents after the earthquake.

Ethics Committee Approval: Ethics committee approval was received for this study from the ethics committee of Gaziantep University (Date: 02.04.2020, Number: 2020/135).

Informed Consent: Informed consent was signed by families and child-adolescents before therapeutic applications.

Peer-review: Externally peer-reviewed.

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REFERENCES

1. Fukuchi N. Psychoeducation for children in a psychiatric ward in the immediate aftermath of the 2011 earthquake and tsunami in Japan. *Intervention* 2020; 18: 85.

2. World Health Organization. Building back better: sustainable mental health care after emergencies. 2013.
3. Brown R, Witt A, Fegert JM, Keller F, Rassenhofer M, Plener P. Psychosocial interventions for children and adolescents after man-made and natural disasters: a meta-analysis and systematic review. *Psychol Med* 2017; 47: 1893-905. [\[Crossref\]](#)
4. Kaymaz HE, Öztürk A, Bağcıoğlu E. Psychiatric evaluation of married women who exposed to domestic violence. *Gaziantep Medical Journal* 2014; 20: 15-9. [\[Crossref\]](#)
5. Beck AT. Cognitive therapy: past, present, and future. *J Consult Clin Psychol* 1993; 61: 194-8. [\[Crossref\]](#)
6. Ceri V, Ahmad A. Exploring psychological vaccination for potentially traumatized children. *J Psychol Clin Psychiatr* 2018; 9. [\[Crossref\]](#)
7. Shapiro F, Maxfield L. Eye movement desensitization and reprocessing (EMDR): Information processing in the treatment of trauma. *J Clin Psychol* 2002; 58: 933-46. [\[Crossref\]](#)
8. Karadağ M, Gökçen C, Sarp AS. EMDR therapy in children and adolescents who have post-traumatic stress disorder: a six-week follow-up study. *Int J Psychiat Clin* 2020; 24: 77-82. [\[Crossref\]](#)
9. Jarero I, Artigas L. The EMDR Integrative Group Treatment Protocol: EMDR group treatment for early intervention following critical incidents. *Eur Rev Appl Psychol* 2012; 62: 219-22. [\[Crossref\]](#)
10. Trentini C, Lauriola M, Giuliani A, Maslovaric G, Tambelli R, Fernandez I, et al. Dealing with the aftermath of mass disasters: a field study on the application of EMDR integrative group treatment protocol with child survivors of the 2016 Italy earthquakes. *Front Psychol* 2018; 9: 862. [\[Crossref\]](#)
11. Guy W. Clinical global impression. Assessment manual for Psychopharmacology 1976; 217-22. [\[Crossref\]](#)
12. Kim D, Bae H, Park YC. Validity of the subjective units of disturbance scale in EMDR. *J EMDR Pract Res* 2008; 2: 57-62. [\[Crossref\]](#)
13. Jarero I, Roque-López S, Gómez J, Givaudan M. Third research study on the provision of the EMDR integrative group treatment protocol with child victims of severe interpersonal violence. *Revista Iberoamericana de Psicopatología y Disociación* 2014; 6: 1-22.
14. Artigas L, Jarero I, Mauer M, López Cano T, Alcalá N. EMDR and traumatic stress after natural disasters: Integrative treatment protocol and the butterfly hug. Poster presented at the EMDRIA Conference, Toronto, Ontario, Canada. 2000.
15. Jarero I, Artigas L, Montero M, Lena L. The EMDR integrative group treatment protocol: Application with child victims of a mass disaster. *J EMDR Pract Res* 2008; 2: 97. [\[Crossref\]](#)
16. Ahmad A. Crisis intervention program for children and adolescents (CIPCA) to prevent posttraumatic psychopathology, preliminary report. *Duhok Med J* 2014; 8: 1-11.
17. Chen Y, Shen WW, Gao K, Lam CS, Chang WC, Deng H. Effectiveness RCT of a CBT intervention for youths who lost parents in the Sichuan, China, earthquake. *Psychiat Serv* 2014; 65: 259-62. [\[Crossref\]](#)
18. O'Callaghan P, McMullen J, Shannon C, Rafferty H. Comparing a trauma focused and non trauma focused intervention with war affected Congolese youth: a preliminary randomised trial. *Intervention* 2015; 13: 28-44. [\[Crossref\]](#)
19. Fernández-Martínez I, Orgilés M, Morales A, Espada JP, Essau CA. One-Year follow-up effects of a cognitive behavior therapy-based transdiagnostic program for emotional problems in young children: A school-based cluster-randomized controlled trial. *J Affect Disord* 2020; 262: 258-66. [\[Crossref\]](#)
20. Adúriz ME, Bluthgen C, Knopfler C. Helping child flood victims using group EMDR intervention in Argentina: Treatment outcome and gender differences. *Int J Stress Manag* 2009; 16: 138. [\[Crossref\]](#)
21. Tang T-C, Yang P, Yen C-F, Liu T-L. Eye movement desensitization and reprocessing for treating psychological disturbances in Taiwanese adolescents who experienced Typhoon Morakot. *Kaohsiung J Med Sci* 2015; 31: 363-9. [\[Crossref\]](#)
22. Proudlock S and Peris J. Using EMDR therapy with patients in an acute mental health crisis. *BMC psychiatry* 2020; 20: 14. [\[Crossref\]](#)
23. Giannopoulou I, Dikaiakou A, Yule W. Cognitive-behavioural group intervention for PTSD symptoms in children following the Athens 1999 earthquake: a pilot study. *Clin Child Psychol P* 2006; 11: 543-53. [\[Crossref\]](#)