The Effectiveness of Online EMDR 2.0 Group Protocol on Posttraumatic Stress Disorder Symptoms, Depression, Anxiety, and Stress in Individuals Who Have Experienced a Traffic Accident: A Preliminary Study

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Introduction: As an innovative procedure, eye movement desensitization and reprocessing (EMDR) 2.0, which is based on standard EMDR, draws attention with its promising results. The adaptation of EMDR 2.0 into the groups will be a great contribution to the psychology literature. Considering the effectiveness of EMDR 2.0 on individual applications, this study is a preliminary study that aims to explore the role of EMDR 2.0 on groups by developing the EMDR 2.0 group protocol (EMDR 2.0 GP).
Methods: In this pilot study, EMDR 2.0 GP is applied to a group of seven participants who had been exposed to a traffic incident. The role of EMDR 2.0 GP (three sessions; 3.5 hours in total) on posttraumatic stress disorder (PTSD)symptoms, depression, anxiety, and stress was measured. The Impact of Event Scale—Revised and the Depression-Anxiety-Stress Scale-21 (DASS-21) were used to assess these symptoms at pretreatment, 1-week posttreatment, and 1-month posttreatment.
Results: The participants (mean age = 47.14 ± 9.65) with a traffic accident experience (mean of the time elapsed = 88.57 ± 38.24 months) received EMDR 2.0 GP. Results showed that the EMDR 2.0

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group had significantly lower depression (χ^2 [2, n = 7] = 9.364, p = .009, Kendall's W = .668) and stress (χ^2 [2, n = 7] = 8.667, p = .013, Kendall's W = .619) on the subscales of DASS-21 and intrusion (χ^2 [2, n = 7] = 6.333, p = .042, Kendall's W = .452), avoidance (χ^2 [2, n = 7] = 7.280, p = .026, Kendall's W = .520), and hyperarousal (χ^2 [2, n = 7]) = 10.800, p = .005, Kendall's W = .771) at posttreatment.

Conclusion: The pilot study of EMDR 2.0 GP indicated that this newly developed protocol that was first applied to the group may be effective in reducing depression, stress, and PTSD symptoms among a nonclinical sample. This pilot study supports the future randomized-controlled EMDR GP application.

Keywords: EMDR; EMDR 2.0; trauma; online EMDR; EMDR 2.0 Group; telehealth intervention

Eye movement desensitization and reprocessing (EMDR) therapy is an evidence-based psychotherapy technique developed by Francine Shapiro in 1987 for the treatment of trauma and associated disorders (Shapiro, 2017). It is recognized as an effective treatment by many national and international organizations, including the American Psychiatric Association, the American Psychological Association, International Society for Traumatic Stress Studies (2018), and the World Health Organization (Lewis et al., 2020; National Institute for Clinical Excellence, 2018). Although the positive effect of EMDR therapy on various conditions has been proven in different studies, it has been observed by clinicians and researchers that the standard protocol may be limited for some clients, and the desired outcome may not be received adequately (Matthijssen et al., 2021). Therefore, based on the standard EMDR therapy, a new protocol called EMDR 2.0 has been developed, especially for unresponsive clients to increase the effectiveness, enhance efficiency, and shorten the duration of standard EMDR therapy (Matthijssen et al., 2021). EMDR 2.0 is basically based on the EMDR standard protocol but with some differences and add-ons related to the application of EMDR therapy (De Jongh & Matthijssen, 2020).

EMDR 2.0 claims that if the client is motivated better, the memory is activated more and the client's working memory is taxed strongly, then it will have a more positive impact on the effectiveness of EMDR therapy (De Jongh & Matthijssen, 2020). This approach has three components: motivation, activation, and desensitization. The motivation, which is the first component, is based on the premise that the client should receive the guidelines on what to do for successful treatment in an understandable way. In addition to the standard protocol of EMDR, the active involvement of the client is very important for an efficient process. In the second stage of activation, some sort of triggers can be used to activate memory, such as visual, auditory, kinesthetic, olfactory, or gustatory. For example, if the client contacts his traumatic memory with the smell of alcohol, then alcohol can be sniffed. The aim of this method is to bring the disturbing material into the consciousness by encouraging the client's participation in the process by triggering objects or experiences (De Jongh & Matthijssen, 2020). When memory is activated in this way, the therapist can use many different strategies to increase the working memory taxation. For example, the client can count numbers backward while performing rapid eye movements, keep a complex rhythm with his hands, or tap his feet on the floor at the same time. The distraction based on the working memory taxation decreases the vividness of the disturbing memory if this material is properly installed in the working memory (Baddeley, 1992; Baddeley, 2010). Therefore, clients must hold the negative memory in their minds while contacting the associated emotions in the meantime (De Jongh & Matthijssen, 2020).

In EMDR 2.0, which is based on the basic theory of working memory, it is claimed that eye movements that are applied in the EMDR standard protocol alone can be sufficient to activate working memory. Therefore, in addition to the standard protocol, EMDR 2.0 uses various working memory taxation tasks to provide a more efficient working memory reprocessing (Matthijssen et al., 2021; Baddeley, 1992, 2010). It is claimed that these additional tasks will increase the level of desensitization by increasing the taxation and activation of working memory and also will prevent the reconsolidation of traumatic memories by using intervention techniques that are not expected by the client (De Jongh & Matthijssen, 2020). EMDR 2.0 approach assumes that if the therapist can successfully make working memory taxation with a dual task while a motivated client keeps the disturbing memory in the

working memory, then both the traumatic impact and the disturbance level of the related memory will drop quickly (De Jongh & Matthijssen, 2020).

In addition to the individual psychotherapy methods, nowadays, group protocols (GPs) are found to be very effective. In 2006, Jarero et al. developed EMDR group therapy specifically for children, and in 2010, Jarero and Artigas enhanced this protocol in the adult population (Jarero & Artigas, 2010). Then, Gonzalez-Vazquez et al. (2018) used EMDR group therapy on a traumatic population and found that GP is much more effective when it includes resource installation, self-care techniques, and processing of dissociative phobias. Another significant contribution to the literature was EMDR group traumatic episode protocol (G-TEP) developed by Shapiro (2012). This protocol targets groups with recent traumatic experiences. It has a strong base due to the well-structured protocol, opportunity of self-bilateral stimulation, and facilitation of deeper processing. G-TEP is found as effective in reducing posttraumatic stress disorder (PTSD) symptoms of German refugees (Lehnung et al., 2017), asylum seekers in the United Kingdom (Kaptan et al., 2022), and Syrian refugees in Turkey (Yurtsever et al., 2018). Thus, EMDR G-TEP is not found as beneficial in reducing negative symptoms but also overall well-being (Morris et al., 2022; Pink et al., 2022).

Although there are a limited number of articles in the literature investigating the effectiveness of EMDR 2.0, the results are promising. According to Matthijssen et al. (2021), the efficacy of EMDR 2.0 is compared with standard EMDR to measure the emotionality and vividness of disturbing autobiographical memories. As a result of this, in spite of the fact that these two approaches had the same impact on individuals, the EMDR 2.0 group needed less session time and a smaller number of sets. It is very important to apply psychotherapy methods to more than one individual at the same time due to economic reasons and time constraints. Therefore, the development of the EMDR 2.0 group application can be a significant alternative to the treatment of trauma and stressor-related disorders. In other words, more people can benefit from this application at the same time. In addition, the fact that the GP of the EMDR flash technique application has been shown to be effective supports the idea that the EMDR 2.0 group application study can be done(Yurtsever et al., 2018; Yaşar et al., 2021, 2022). To our knowledge, there is no GP for EMDR 2.0 application.

In this pilot study, it was aimed to investigate the efficacy of EMDR 2.0 GP, applied as a telehealth intervention, with seven individuals who had been exposed to a traffic accident. The study design of this pilot study included a pretreatment assessment phase, an intervention phase consisting of three treatment sessions (210 minutes in total), a posttreatment assessment (1 week after the last treatment session), and a follow-up assessment (1 month following the last treatment session). One of the hypotheses was that the EMDR 2.0 GP would be associated with statistically significant reductions in symptoms of depression, anxiety, and stress reactions. Specifically, the scores of the participants in the Depression-Anxiety-Stress Scale-21 (DASS 21), which were completed in posttreatment assessment and follow-up assessment, were expected to be lower than the scores that were obtained from the same scale before the application. Another hypothesis of the study was that the participants' symptoms of re-experiencing, avoidance, and hyperarousal of the traumatic memory would decrease compared with the levels of these symptoms in the pretreatment assessment phase. It was expected that the scores obtained by the participants from the Impact of Event Scale—Revised (IES-R), which was filled before treatment sessions, would be higher than the scores obtained from the same scale filled in the posttreatment assessment and the follow-up assessment.

Method

Sample

This pilot study evaluated the effect of EMDR 2.0 GP on traumatic stress, anxiety, and depressive symptoms of a group of seven individuals. An online invitation was sent to a group of mental health professionals who have PTSD symptoms due to the traffic accident. Nine people applied to the study out of 70 members. Two people could not participate in the study due to medical or technical issues, and the study was carried out with seven volunteers who fulfilled the inclusion criteria. The inclusion criteria were (a) being older than 18 years, (b) a traffic accident experienced between 6 months and 10 years, (c) not having a mental disability as a result of a traffic accident, (d) having a less Adverse Childhood Experiences (ACEs) scale score than seven (Gunduz et al., 2018), (e) absence of a serious psychiatric disorder such as

schizophrenia or bipolar disorder, (f) not to have severe head trauma, (g) to have necessary technical knowledge and equipment to participate in the study, and (h) to volunteer to participate in the study.

Procedure

The study was conducted for 3 days between the 12th and 14th of August 2022. The duration of the application was 210 minutes (the first session was 90 minutes, and the following two sessions were 60 minutes each), and it was made available to this group via the Zoom platform for 3 days. Participants were asked to fill out the ACEs scale, Sociodemographic Form, IES-R, and DASS-21 before the application. IES-R and DASS-21 follow-up scales were applied 1 week and 1 month after the completion of the application, respectively.

EMDR 2.0 Group Protocol

In this study, EMDR 2.0 GP was applied. In addition to the article, the details of the protocol and the participant client tracking chart are presented supplementary. The first session lasted for 90 minutes, and the next two sessions lasted for 60 minutes. After a short introduction, the participants were informed about the protocol, their consent was obtained for registration, and a visual bilateral stimulus screen (a point moving horizontally to the right and left) that will be used in the application was introduced. After the safe place exercise was carried out, they were asked to identify three disturbing images of the traffic accident. It was requested that the subjective units of disturbance (SUD) scores out of 10 will be assigned to all images. Then, EMDR 2.0 GP was applied as described below:

1. The explanation and application of the guidelines:
    a. Participants focus on the image in each set and follow the horizontally moving point in the screen with eyes for bilateral stimulation.
    b. During the bilateral stimulation, a dual task is applied to each set for the activation of working memory taxation. The task is changed once in approximately three sets (there is no rigid rule for the changing time of tasks).
    c. During the bilateral stimulation, it is requested to focus on both the task and the image.
2. Evaluation check:
    a. For every two sets, participants were asked for their focusing on the memory (FM) score out of 100 to rate how long they can stay in the memory during the two-way stimulation in the last two sets.
    b. For every two sets, participants were asked to score their performing the task (PT) score out of 100 to rate how much they can focus on the task during the two-way stimulation in the last two sets.
    c. The SUD score of the selected image is asked.
    d. It is asked to write down all these scores (SUD, FM, and PT) in the participant form.
3. All these steps were followed until the end. There is a progressive drop expected in distress measured by SUD scores, and participants who give 0 out of 10 for the first image continue with the second one. Other participants continue to work on the first image.
4. At the end of the application, participants were asked to read all SUD scores from the first set to the last one.
5. The application was completed with stabilization and orientation exercises.

If possible, a higher number of sets were performed, depending on the time in each session. During the specified time period in this study, seven sets were performed on the first day, eight sets on the second day, and six sets on the last day (an average of seven sets on each day).

In the study, distracting instructions were given, such as listening to various songs, counting repetitive words in the song, performing bodily movements, and counting backward the letters of some words. In the last 2 days, participants were asked to perform dual tasks at the same time in some sets. After each session, an evaluation form was sent to them. In this form, SUD, the FM score, and the PT score of the related images they worked on were asked. Afterward, they were asked if they had passed to the other memory, and if they had passed, the relevant scores were asked to be written.

Measuring Instruments

Sociodemographic Form

A semistructured data form is applied by the researchers in which the demographic data of the participants, such as age and gender, and data related to their trauma on traffic accident are asked in accordance with the literature.

Adverse Childhood Experience Turkish Form

ACE was developed to explore an individual's life before the age of 18, which included unpleasant childhood events like various types of violence, abuse, and neglect. It is a self-report scale consisting of 10 items. The Turkish validity and reliability studies of the scale were conducted by Gunduz et al. (2018).

The Impact of Event Scale-Revised

The IES was developed by (Weiss, 2007) and applied to measure the amount of effect of people from an event in the study. It is a self-report 5-point Likert-type scale and includes 22 items. It evaluates the level of exposure to events in three different fields, such as "intrusion," "avoidance," and "hyperarousal." The Turkish validity and reliability studies of the scale were carried out. The Cronbach's alpha value of the Turkish version of the scale was found to be 0.93 (Çorapçıoğlu et al., 2006).

The Depression-Anxiety-Stress Scale-21

The DASS-21 was used to determine the depression, anxiety, and stress symptoms of the participants. The scale has 21 items that are evaluated on a 4-point Likert-type scale. The score that can be obtained from the scale for each subdimension changes between 0 and 21. The Turkish validity and reliability study of the scale were conducted. The Cronbach's alpha value of the Turkish version was found as $\alpha = .87$ for the depression subscale, $\alpha = .85$ for the anxiety subscale, and $\alpha = .81$ for the stress subscale (Saricam, 2018).

Statistical Analysis

Statistical Package for the Social Sciences (SPSS) 22 package program was used to perform statistical analyses on study data. Continuous variables were presented with frequency, percentage, mean, and median. The Friedman test was used to analyze the differences in the participants' psychometric measurements. Post hoc analyses were measured with Durbin–Conover. The effect size was determined using Kendall's W. A value of $p < .05$ was considered statistically significant.

Results

The analysis of this pilot study was carried out with a total of seven participants. The participants in the study had a mean age of 47.14 ± 9.65 (median: 43), and all participants were women. The mean of the time elapsed by the participants after the traffic accident is 88.57 ± 38.24 (median: 110).

Table 1 compared the DASS-21 anxiety, depression, and stress subscale scores and the traffic-accident memory-related symptoms in the EMDR 2.0 GP group before the incident, 1 week after the incident, and 1 month after the incident. As a result, there was a statistically significant decrease in the DASS-21 depression (χ^2 [2, $n = 7$] = 9.364, $p = .009$, Kendall's $W = .668$) and stress (χ^2 [2, $n = 7$] = 8.667, $p = .013$, Kendall's $W = .619$) subscores, while no statistically significant difference was found in the DASS-21 anxiety (χ^2 [2, $n = 7$] = 3.364, $p = .186$, Kendall's $W = .240$) in the EMDR 2.0 GP group. Post hoc analyses showed that the DASS-21 depression score had significantly decreased in 1-week ($p < .001$) and 1-month ($p = .008$) follow-ups compared with pretreatment. Similarly, the DASS-21 stress score was significantly decreased in 1-week ($p = .010$) and 1-month ($p = .001$) follow-ups compared with pretreatment.

Also, there was a statistically significant difference in IES-R intrusion (χ^2 [2, $n = 7$] = 6.333, $p = .042$, Kendall's $W = .452$), avoidance (χ^2 [2, $n = 7$] = 7.280, $p = .026$, Kendall's $W = .520$), and hyperarousal (χ^2 [2, $n = 7$] = 10.800, $p = .005$, Kendall's $W = .771$) after EMDR 2.0 GP application. Post hoc analyses demonstrated that the IES-R intrusion score had significantly decreased in the 1-week ($p = .014$) and 1-month ($p = .027$) follow-ups compared with pretreatment. Also, the hyperarousal score had significantly decreased in the 1-week ($p < .001$) and 1-month ($p < .001$) follow-ups compared with pretreatment. However, there were no significant differences among pretreatment, 1-week ($p = .011$), and 1-month ($p = .853$) follow-ups in the IES-R avoidance score according to the post hoc analyses.

TABLE 1. Changes in Participants' Psychometric Measurements With EMDR 2.0 Group Protocol

	Before EMDR 2.0 (median [IQR])	One week after EMDR 2.0 (median [IQR])	One month after EMDR 2.0 (median [IQR])	Pairwise comparisons (Durbin–Conover)			Friedman test	Kendall's *W* (effect size)
				Before 1 week	Before 1 month	From 1 week to 1 month		
DASS-21								
Depression	3 (1.5–4)	0 (0–1.5)	1 (0–3.5)	**$p < .001$**	**$p = .008$**	$p = .115$	$\chi^2 = 9.364$ $df = 2$ **$p = .009$**	.668
Stress	5 (3.5–6)	1 (1–2.5)	1 (0–2.5)	**$p = .010$**	**$p = .001$**	$p = .244$	$\chi^2 = 8.667$ $df = 2$ **$p = .013$**	.619
Anxiety	2 (1–4)	0 (0–1.5)	0 (0–2)	$p = .104$	$p = .135$	$p = .875$	$\chi^2 = 3.364$ $df = 2$ $p = .186$	.240
IES-R								
Intrusion	3 (2.5–4.5)	1 (0–1)	0 (0–2.5)	**$p = .014$**	**$p = .027$**	$p = .724$	$\chi^2 = 6.333$ $df = 2$ **$p = .042$**	.452
Avoidance	2 (1.5–5)	0 (0–.5)	3 (1–3.5)	**$p = .011$**	$p = .853$	**$p = .007$**	$\chi^2 = 7.280$ $df = 2$ **$p = .026$**	.520
Hyperarousal	3 (2.5–4)	1 (0–1)	1 (0–1)	**$p < .001$**	**$p < .001$**	$p = 1.000$	$\chi^2 = 10.800$ $df = 2$ **$p = .005$**	.771

Note. DASS-21 = Depression-Anxiety-Stress Scale-21; IES-R = Impact of Event Scale—Revised; IQR = interquartile range.

Discussion

The current pilot study that was carried out to demonstrate the feasibility and effectiveness of the EMDR 2.0 GP application developed on the basis of EMDR 2.0 to a group of people who had been exposed to a traffic accident in the last 10 years showed that the GP can be effectively applied online. In addition, the hypothesis that significant reductions in the symptoms of the depression and stress levels of the participants would be associated with the EMDR 2.0 GP was supported in this study. There was a statistically significant decrease in the DASS-21 depression and stress subscores completed in posttreatment assessment and in follow-up assessment compared with the scores that were obtained from the same scale before the application.

As another hypothesis of the study, the expected decrease in the participants' symptoms of re-experiencing, avoidance, and hyperarousal of the traumatic memory was observed compared with the levels of these symptoms in the pretreatment assessment phase. The decrease in the psychometric measurement levels of the participants compared with the pretreatment assessment phase continued generally in the measurements that were applied 1 week and 1 month after the application. Considering that previous studies on EMDR 2.0 GP application (Matthijssen et al., 2021) were based on individual applications, these results are important as they are the first evidence in the literature that the EMDR 2.0 GP application protocol is applicable and effective.

It has been stated in many studies that the main mechanism underlying the effectiveness of EMDR 2.0 may be based on the working memory theory (Baddeley 1992, 2010; de Jongh et al., 2013; De Jongh & Matthijssen, 2020; van Veen et al., 2016). According to this theory, while a person's working memory is trying to perform more than one task at the same time, the degree of discomfort caused by the traumatic memory decreases, and this change is reinforced (de Jongh et al., 2013; Schwabe et al., 2014). As a result of the study conducted by van Veen et al. (2015), it was found that as the working memory load increases, the desensitization effect increases in direct proportion.

As in the EMDR 2.0 application, when a traumatic memory comes to the working memory, the working memory is loaded with different tasks, so the person feels less disturbed about this memory, and the emotional intensity and vividness of the memory decrease. In line with the current study, it was stated in previous studies (James et al., 2015; van Veen et al., 2016) that the better the traumatic memory is activated, the effect of trauma-focused therapy increases.

Furthermore, in the study conducted by Littel et al. (2017), they stated that there is evidence showing that the more arousal the client experiences, the better the memory responds to EMDR therapy. Matthijssen et al. (2018) stated that the working memory taxation method specific to EMDR 2.0 has an additional desensitization effect. In addition, it can be stated that movements unexpected by the clients, which also take part in the EMDR 2.0 application, have an effect on desensitization, in line with the studies (Sinclair & Barense, 2018; Matthijssen et al., 2019) stating that unexpected (surprise) effects interrupt the reconsolidation of memory.

In addition to the working memory theory, it can be mentioned that another mechanism could be the unconscious exposure theory. According to this theory, it is considered that amygdala activation prevents the processing of the traumatic memory, but multitasking prevents the amygdala activation, and the continuation of processing is ensured (Brouwers et al., 2021; de Voogd & Phelps, 2020; Manfield et al., 2021). During the application of EMDR 2.0, the functioning of the amygdala decreases as the working memory is loaded (de Voogd & Phelps, 2020). However, considering the rapid effectiveness of EMDR 2.0, it is obvious that it may have a rather novel and unexplained mechanism of action, and further research is needed on this subject.

Various tasks used in the EMDR 2.0 application (e.g., counting specific repetitive words in the song) may have been effective in keeping the participants in a relatively positive mood and thus reducing the emotional burden of the traumatic event. It is conceivable that during the EMDR 2.0 sets, as participants remained in a positive memory state for longer and had short-term exposure to traumatic material, the negative charge of the traumatic event decreased. Apart from PTSD, EMDR 2.0 may be a good option in terms of increasing the comfort level of the participants, especially for conditions such as dissociative syndromes and depression, which are difficult to recall positive memories. Compared with the EMDR standard protocol, participants experience a very pleasant emotion during the EMDR 2.0 application. It can be considered one of the advantages of EMDR 2.0 GP that it provides less contact with the traumatic event and a relatively pleasant application opportunity. In addition, the short-term

contact with the traumatic memory and the fact that the client does not need to explain the traumatic event facilitate the implementation of this method in groups. In situations where time and resources are limited (e.g., natural disaster areas) and long-term therapy is not possible, the EMDR 2.0 GP has a significant advantage. In addition, the EMDR 2.0 GP may be suitable for both inpatient and outpatient groups. The fact that EMDR 2.0 GP can be applied online will also enable it to reach individuals who are deprived of therapy for both distance and different reasons.

The first hypothesis of this study, the decrease in the depression, stress, and anxiety levels of the participants compared with the preapplication, was partially supported. While the EMDR 2.0 GP applied in the study led to a decrease in the depression and stress levels of the participants, there was no significant change in their anxiety levels. The reason for the lack of reduction in anxiety symptoms may be that the participants had other negative life experiences, as seen in their ACE scores. The decrease in the depression and stress levels of the participants compared with before the application continued in the measurements was applied 1 week and 1 month after the application. As another hypothesis of the study, the expected decrease in the participants' symptoms of re-experiencing, avoidance, and hyperarousal of the traumatic memory was observed compared with the preapplication. The decrease observed in re-experiencing and hyperarousal symptoms compared with preapplication continued in the measurements made 1 week and 1 month after the application. However, there was a decrease in the avoidance symptoms of the participants in the measurements made 1 week after the application compared with the pretreatment, while there was no significant difference in the measurement made after 1 month compared with the pretreatment. In this study, EMDR 2.0 GP was applied for the first time, and a decrease was observed in the participants' depression, anxiety levels, re-experiencing, and hyperarousal symptoms associated with traumatic memories. These results are promising for the effectiveness of the developed EMDR 2.0 GP application.

The results of the present study should be evaluated within some limitations. The first of these is that the control group or a comparison group applied to a different therapy was not included in the study. Therefore, it is not possible to exclude other possible reasons for the results obtained from the study, such as the passage of time or the fact that the participants shared their traumatic memories briefly in the group and so on. Another limitation is the relatively small number of participants and the fact that all of them are women. It is recommended to work with samples with different demographic characteristics, such as age and gender, in order to reach more reliable results. In addition, although the sample consisted of people who had a traumatic experience related to a traffic accident between 6 months and 10 years, these people did not have a clinical diagnosis of PTSD. For this reason, it may be useful for future research to include clinical samples or other challenging situations. Finally, the participants were followed for 1 more month after the application, and no measurements were made afterward.

Conclusion

As a result, with the current study, EMDR 2.0 GP was applied to a group with a traumatic experience for the first time, and it was observed that the depression, stress, and PTSD symptom levels of the participants decreased compared with the preapplication. The results of the current study are promising for future EMDR 2.0 GP applications, but further research is strongly needed. For future studies, it is recommended that EMDR 2.0 GP applications be studied in samples consisting of people who have experienced different challenging life events.

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Supplementary

Focusing on the Memory Score: Ability to Keep the Image in Mind Performing the Task Score: Ability to Perform the Task

Introduction: First Day
10 minutes

Introducing the team, meeting briefly with the participants, checking if the document they will register the scores is printed, briefly explaining how to use the scoring sheet (done by screen sharing), asking them to make their screen horizontally if the mobile phone is used, and asking their verbal consent for zoom recording.

1. Motivational Speech

"Welcome back, we are so glad to see you with us today. Today, we will work together to resolve the negative effects of your disturbing traffic accident experience. We will experience together the group version of a special technique that is proven as effective by individually conducted scientific studies. In this study, you will not be asked to tell us or each other about your traumatic experiences in detail because talking about the traumatic memory may have negative impact on other participants. So, we will ask questions about the levels of emotion you feel when you look at the memory instead of the details of the memory. Then, we will give some points to the memory on the level of the disturbing feelings."

"The most important part of this application will be trying to keep in mind the image that represents this uncomfortable experience."

"While trying to keep this image in mind, I will also ask you to follow a ball moving horizontally on the screen and perform some tasks."

"Keeping the image in your mind while trying to perform some tasks will allow you to use the capacity of your working memory in the maximum level. So, it will allow your brain to process information at the highest level. In the end, you will not feel high level of discomfort. As your brain processes information, the memory will begin to disintegrate, dissipate, become blurred, and become less emotionally charged. Isn't it very exciting?"

"If we are ready, then we can begin."

2. Safe Place

"Now, please imagine a place where you feel calm and relaxed. Can you describe this peaceful imagined place? Is there any sea? A forest? Maybe both? What would you like to do in there? What kind of sounds you hear? Or smells, and so on. Please, spend 1 minute in your safe place and enjoy … . What would be the most positive word you could say to describe this whole experience? Let this word be your clue word that will remind you of this experience. Please note this word in your scoring sheet. If you want to write more than one word, of course you can …"

3. Box Exercise

"Now, I want you to put every disturbing experience except the memory we will work today (a problem in your daily life, or other old memories, feelings, etc.) in a mental box and imagine that you are putting the box away from yourself and the room you are in. Is it possible? Were you able to do it? Great."

4. Choosing the Disturbing Images of Memory

"Think about the traffic accident that we are going to work on today. Think about how it started, what happened, what happened after the accident. When you think about the time period from the beginning to the end, I want you to choose 3 images that disturbs you most at the moment."

"Can you write down the three images you have selected on your papers? Now, please write down the disturbance level of each images out of 10 in the place where it says SUD. Focus on the disturbance level of the image right now. Score of 0 means that it is neutral and 10 means the highest disturbance. So, how much these images make you feel disturbed right now?"

(When the writing process is completed, ask the participants to tell their SUD scores loud).

"I will share my screen during the study, here is the ball that you will follow with your eyes, let's give it a try... Great!"

5. Desensitization

At this stage, each task is completed three times and moved on to the next task. If there is any time left, the initial tasks will be requested again. If there are some participants who cannot perform certain tasks due to physical limitations, or if anyone expresses that songs or words are triggering, minor changes can be made. At the end of each two sets, the subjective units of disturbance (SUD), focusing on the memory (FM), and performing the task (PT) scores of the last two sets are read out loud. If FM or PT scores are high like 10 after 3 sets, intervention is done. If a participant can't stay in the memory or perform the given task, a motivational speech is made to focus on the memory or task. Their eye movements are followed by cameras to see the pupils of the eyes are going right.

1. Task: 25 set EM + listening to song

Three times

"Now, imagine the selected image that is most disturbing and follow the ball with your eyes. I'm going to make some noise in the background to push you a little bit more but please keep the memory in your mind while following the ball."

They are asked to write down their SUD, FM, and PT scores after two sets and share with others.

2. Task: 25 set EM + listening to song + counting the word of "salla" or "senden başka" (they are Turkish words that are repeated in the song)

Three times

"Let's make our working memory to work a little bit more. Now, keep the image in your mind while following the ball with your eyes. At the same time, try to count the repeated words 'salla' and 'senden başka' in the song playing behind."

They are asked to write down their SUD, FM, and PT scores after two sets and share with others. After the sixth set, they are asked to read out loud their SUD scores from the beginning. If there are some participants who have no difference in their SUD scores, then it is discussed about their FM or PT tasks.

3. Task 25 set EM + listening to song + 2-2-1 tapping

"Now, let's involve the different units of our working memory and make it work harder. Now, keep the image in your mind while following the ball with your eyes. At the same time, try to tap your hands to the table in the same rhythm as I showed you."

They are asked to write down their SUD, FM, and PT scores after two sets and share with others.

4. Task: 25 set EM + listening to song + opening and closing arms

"Now, let's involve our body to the task. Now, keep the image in your mind while following the ball with your eyes. At the same time, try to open and close your arms."

They are asked to write down their SUD, FM, and PT scores after two sets and share with others.

5. Task: 25 set EM + listening to song + try to spell backward of the word "GAZİANTEP" (a city in Turkey)

"Now, let's try something that really works hard our working memory. Keep the image in your mind while following the ball with your eyes. At the same time, try to spell backward of the work of GAZİANTEP."

They are asked to write down their SUD, FM, and PT scores after two sets and share with others. If any time is left, then the initial tasks can be tried again.

Closure

They are asked to read out loud their SUD scores from the beginning.

"We can stop now. You all worked hard from the beginning and did a great job. We'll pick up where we left off tomorrow. Please, put everything that is disturbing to your mental box until we meet again tomorrow. Let go of your all the disturbing emotions, images, bodily sensations into the box … . Close and lock the box and put it away from yourself again. Let them stay in the box until we work again tomorrow …"

"Now sit comfortably in your chair and remember your clue word to activate your safe place, which is calm, peaceful, and safe for you. Give yourself time for your mind to create that space … you can close your eyes if you want … . Enjoy this safe space that belongs to you …"

"Now slowly wake up your body, maybe you can start by wiggling your fingers and toes … .Open your eyes and look at the room as you are looking at it for the first time. While moving your eyes around in your room, let your body do whatever it wants; maybe stretching, maybe changing the sitting position … whatever you need … Great!"

"We will be looking forward to meeting you again tomorrow. See you at the same time."

Second and Third Day Introduction

"Welcome back again!"

"Is there anything you have noticed since our last meeting? Without sharing the details about the memory, can you share if there is anything you have noticed since the last session?"

"We want you to remember again the images of the memory that you worked on yesterday (in the last session) and put in the box. Now please take these images out of the box again and write the disturbance level of each image on the scoring sheet again. When you write down, we will ask you to share it with us. How much are they disturbing right now?"

"If the image you worked yesterday still disturbs you, then we recommend you to continue to work on it. If this image becomes no more disturbing, then you can switch to the next high-rated image with the highest SUD."

Then, the stages are repeated.

AP: Image
Scoring Sheet:
Safe Place Clue Word:

Select the 3 images of the memory (or pictures) about the traffic accident that cause you to feel disturbed and write down how much it disturbs you at the moment on a scale of 0–10.

(**0 = neutral and 10 = highly disturbing**)

If you think that it will make it easier for you to remember the images you have selected in the following days, you can write down clue words in the boxes that will remind you of the relevant image.

	1. Day SUD	**2. Day SUD**	**3. Day SUD**
1. Image (AP-1)			
2. Image (AP-2)			
3. Image (AP-3)			

Please use the table to write down your scores.
Image (AP): The selected image *(you can note like 1, 2, 3 for the image)*.
SUD: Disturbance level *(0 = neutral and 10 = highly disturbant)*.

AK: Ability to keep the image in mind as percentage *(0 = never keep the memory in mind and 100 = completely keep the image in mind)*

GY: Ability to perform the task as percentage (*0 = never do the task and 100 = completely do the task)*

1. Day

	AP	**SUD**	**AK**	**GY**
1. Set				
2. Set				
3. Set				
4. Set				
5. Set				
6. Set				
7. Set				
8. Set				
9. Set				
10. Set				
11. Set				
12. Set				
13. Set				
14. Set				
15. Set				
16. Set				
17. Set				
18. Set				
19. Set				
20. Set				

2. Day

	AP	SUD	AK	GY
1. Set				
2. Set				
3. Set				
4. Set				
5. Set				
6. Set				
7. Set				
8. Set				
9. Set				
10. Set				
11. Set				
12. Set				
13. Set				
14. Set				
15. Set				
16. Set				
17. Set				
18. Set				
19. Set				
20. Set				

3. Day

	AP	SUD	AK	GY
1. Set				
2. Set				
3. Set				
4. Set				
5. Set				
6. Set				
7. Set				
8. Set				
9. Set				
10. Set				
11. Set				
12. Set				
13. Set				
14. Set				
15. Set				
16. Set				
17. Set				
18. Set				
19. Set				
20. Set				