

EMDR as treatment of post-traumatic reactions: A field study on child victims of an earthquake

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Abstract

This field study explores the effectiveness of EMDR (eye movement desensitisation and reprocessing) for the post-traumatic reactions of child victims in the post-emergency context of an earthquake that occurred in 2002 in Molise, a region of Central Italy. EMDR was chosen as the treatment for the children of the San Giuliano Primary School in Molise. Twenty-two of the children who experienced the traumatic event, being suddenly buried under the debris of their collapsed school and in contact with the bodies of their dead classmates for hours, received three cycles of EMDR treatment over one year, with a total average of 6.5 sessions of EMDR each. The results show that EMDR contributed to the reduction or remission of PTSD symptoms and facilitated the processing of the traumatic experience.

EYE MOVEMENT desensitisation and reprocessing (EMDR) is a recently developed treatment that facilitates the resolution and integration of traumatic memories and has proved effective for the treatment of post-traumatic stress disorder (PTSD). The approach is used to access, process and facilitate the integration of traumatic memories leading to their adaptive resolution. This is a complex methodology that is structured in eight phases and requires the subject to focus on the traumatic memory (target), while being exposed to a bilateral sensory stimulation, thus helping and accelerating adaptive processing.

This therapeutic methodology has already been used in different kinds of trauma in the field of PTSD (American Psychiatric Association, 2004; Chambless *et al.*, 1998; Foa *et al.*, 2000), and its effectiveness with PTSD has been explored in emergency situations (Bleich *et al.*, 2002) and with child victims of trauma (Chemtob *et al.*, 2002; Fernandez *et al.*, 2004; Jaberghaderi *et al.*, in press; Jarero *et al.*, 1999). This field study explores the effectiveness of EMDR on the level of reported post-traumatic reactions and symptoms in the context of a specific

emergency: the Molise earthquake of 2002. The primary purpose of this study was to assess the anticipated remission or reduction of PTSD symptoms in the primary school children who survived the earthquake.

The project has been an excellent example of the collaboration between mental health public agencies (ASL) and the EMDR Association in Italy, whose members went to the earthquake site three times on a volunteer basis. EMDR was a specialised part of an extensive and comprehensive emergency psychology programme at the earthquake site.

Since the event met all the DSM IV criteria for PTSD (American Psychiatric Association, 1994, 2000), and since EMDR has proved to be very effective for this kind of disorder, it became the treatment of choice with the school population. No one in Italy will forget this traumatic earthquake for many years. The only building that collapsed in the earthquake was the primary school, and 27 out of 59 children were killed. As clinicians we know that, without treatment, the people who experienced the event, like the surviving children or the rescuers, could be forced by their brain not only to remember, but also continuously to relive it. Consider-

ing the developmental age of the children, without a focused and effective treatment their personality could develop around the traumatic event and adapt to it, increasing the risk of developing psychological disorders later in life. Single or chronic trauma can have a serious impact on psychological functioning even years after the event. Morgan *et al.* (2003) noted that in one disaster where many children were killed in their school (Aberfan) it was estimated that, 33 years later, some 29 per cent of the survivors still suffered from PTSD.

For this reason it was essential to intervene in the aftermath of this disaster, providing psychological support and appropriate treatment. Among the methodologies used with the entire population were educational groups, active listening, defusing, debriefing and EMDR.

Method

Participants

As noted, the event met all the criteria for PTSD. The children were exposed to a direct and extreme situation which caused the death of their friends and classmates and where their own lives were threatened (the survivors were convinced that they would not be rescued from the rubble). The post-traumatic reactions were not only linked to the stress of having almost died, but also to grief for the death of their classmates, cousins and siblings and to the exposure to their dead bodies under the rubble (from 1 to 10 hours). Furthermore, it is important to consider that many of these small victims also lost their homes, their daily life routine and, above all, their friends. All of these factors accumulated and increased the probability of developing PTSD. As indicated in the NICE guidelines (National Institute for Clinical Excellence, 2005), individuals at high risk of developing PTSD after a major disaster should be screened for PTSD one month after the disaster. During the earthquake the school was destroyed and all the six-year-old children died. Altogether, 32 children survived and 27 died. Of the children who sur-

vived 29 were treated with EMDR. Of these, three dropped out and four did not participate in the full treatment programme. For this reason the data analysis and the conclusions of this study refer to the remaining 22 children who participated in the full programme. The age range of the children treated was between 7 and 11 years.

Procedure

EMDR was agreed upon and supported by the Italian National Health Service, the authorities and the school personnel, as well as by the parents of the children treated. The school faculty was cooperative and supportive during treatment. These people were also provided with psychological support through active listening, group debriefings, group meetings about children's reactions to stress, information sessions on how to manage the classes on a day-to-day basis and information on EMDR treatment.

Educational meetings with parents were an essential part of the intervention programme, addressing stress reactions and advising on how to manage their traumatised children in order to provide a more effective support aimed at reducing and normalising their reactions. The support and information given to the parents were useful tools to help and to reassure their children. A questionnaire on symptoms was administered and full information about the intervention with children and about EMDR was given in order to obtain informed consent. Questionnaires focusing on post-traumatic stress reactions of the children were administered to help them identify the children's conditions and enhance cooperation during the whole process.

Parents were allowed to attend their children's EMDR sessions in order to support and help them understand the processing experience. This facilitated post-treatment support, shared and discussed by the clinicians after each treatment cycle. Parents' involvement and cooperation were so strong that it led them to ask for support for their other children and for themselves.

The three cycles of treatment took place one month, three months and a year after the event, with a total average of 6.5 EMDR sessions per child. The earthquake occurred on 31 October 2002, and the first EMDR treatment cycle was administered in the first week of December, the second in February and the third and last one in November 2003.

The EMDR treatment was conducted according to the standard protocol presented by Shapiro (2001) and Greenwald (1998). Targets for EMDR treatment were the most disturbing part of the event, the present triggers provoking anxiety and the future situations generating anticipatory anxiety. All eight phases of the EMDR treatment protocol were carefully followed: history-taking, preparation (relaxation with a 'safe place' exercise, explanation and description of the method, target identification) and assessment preceded EMDR processing sessions, which were followed by desensitisation, installation, body scan, closure and re-evaluation (see Grandison in this issue for a brief account of these phases). Children's individual sessions lasted from 30 to 90 minutes, depending on the developmental level and response of each child. The questionnaire was administered a week before and a week after each EMDR treatment cycle. From these findings five measures were obtained:

- 11 December 2002 (pre-treatment assessment);
- 28 January 2003 (post treatment and pre-treatment assessment of February cycle);
- 10 February 2003 (post-treatment assessment);
- 20 November 2003 (pre-treatment assessment);
- 1 December 2003 (post-treatment assessment).

Some common memories addressed with many children and used as the first target memory for EMDR processing, were the following:

- when I was found under the rubble with my veins open, risking bleeding to death;

- the image of four dead children around me;
- darkness, and my mother's anger at my being late;
- in the afternoons I am alone, because all my friends are dead;
- the moment when the walls fell and the floor moved;
- when my parents told me that my friend was dead;
- a bleeding hand hanging over my face.

Assessment tools

The assessment tools were administered to the children five times by independent assessors, that is, the psychologists of the local public health unit. Clinicians belonged to the national EMDR Association and went to the earthquake site from other cities (Milan and Rome). Diagnosis and assessment were therefore conducted by independent assessors and not by those conducting the clinical intervention. The effectiveness of the three treatment cycles and the trend of PTSD symptoms following EMDR were assessed using the results of a directly administered questionnaire prepared by the National Institute of Health to study the symptoms of the three clusters of PTSD in children. The questionnaire consisted of a list of typical PTSD symptoms. It included items on intrusiveness, avoidance and hyper-arousal in order to identify the number of symptoms for each cluster and make a DSM-IV TR PTSD diagnosis. This was supported by the use of the SCID-1, Clinical Version (First *et al.*, 1997).

The NICE guidelines state that effective treatment of PTSD can only take place if the disorder is recognised, and that identification of PTSD in children causes specific problems, but improves if children are asked directly about their experiences. Our experience was that children were able to describe their experience and present reactions clearly and in a matter-of-fact way to their therapists. Also, when asked about the most disturbing part of the event, they were able to identify the targets for EMDR treatment as shown above in the procedure section.

Results

The data recorded for the five measures were analysed using the Wilcoxon matched pairs signed ranks test. Table 1 shows the results for each of the three clusters of PTSD symptomatology as well as a combined result for all three clusters together, based on a comparison of the first measure (December 2002) and the last measure (December 2003). Figures 1–3 show the measurements across each of the five time points.

These results point to a significant decrease over the treatment period in overall PTSD symptomatology. When the three clusters are taken together the difference is

Cluster	Statistical significance (Wilcoxon test)
Avoidance	= 0.015
Intrusive-ness	= 0.011
Arousal	= 0.015
Sum of clusters	= 0.003

Table 1: Clusters of symptomatology of PTSD. Comparison December 2002–December 2003

significant beyond the 0.01 level. In addition, each of the three clusters analysed separately, while falling marginally short of this level, is significant beyond the 0.05 level.

The meaning of these results in practical terms can be illustrated by considering the proportion of the sample that met DSM-IV criteria for PTSD before and after EMDR treatment (Figure 4). While the numbers remained at a similar level during the acute period following the trauma, with no reduction apparent in the early stages at January 2003, the numbers thereafter reduced steadily, from an initial figure of 61 per cent to a final figure of 9 per cent.

Discussion

This study presents the outcomes for 22 children in relation to PTSD one year after a major trauma, following treatment using EMDR. The percentage of subjects who developed PTSD a month after the event was very high. However, the trauma of which these children had been victims was extreme in its severity, and in disasters at this level comparably high rates of PTSD have been reported in the literature (see Galea *et al.*, 2005, for a review). The remaining children who did not develop PTSD within three months of the event did not develop it at all.

Three months after the event, as indicated in the January 2003 report, there had been no decrease in the number of children identified as having PTSD. This is an indication of the fact that the reactions to stress did not decrease naturally. According to DSM-IV it is expected that within three months of the traumatic event 50 per cent of the population should present a spontaneous remission of the symptoms of PTSD. In contrast with this projection, the expected improvements did not take place within this timescale. Other factors could be important here – for example, the death of another child two months after the earthquake, the decrease in volunteers and media attention and the return to daily life for the first time in the month of January. This is consistent with the PTSD literature, which points to the possibility of symptoms fluctuating, with a worsening following new stressful life events or memories of the original trauma (Rubin, 2003).

Over the course of treatment there was a significant decrease in all measures of PTSD symptomatology, and by the end of one year only three of the treated children still met PTSD diagnostic criteria. These results point to the effectiveness of EMDR as a therapeutic intervention for these primary school children following a major critical incident.

The interpretation of the data must take account of a number of limitations in this field study. The most important of these are the lack of a control group and the small sample size. These were factors that it would

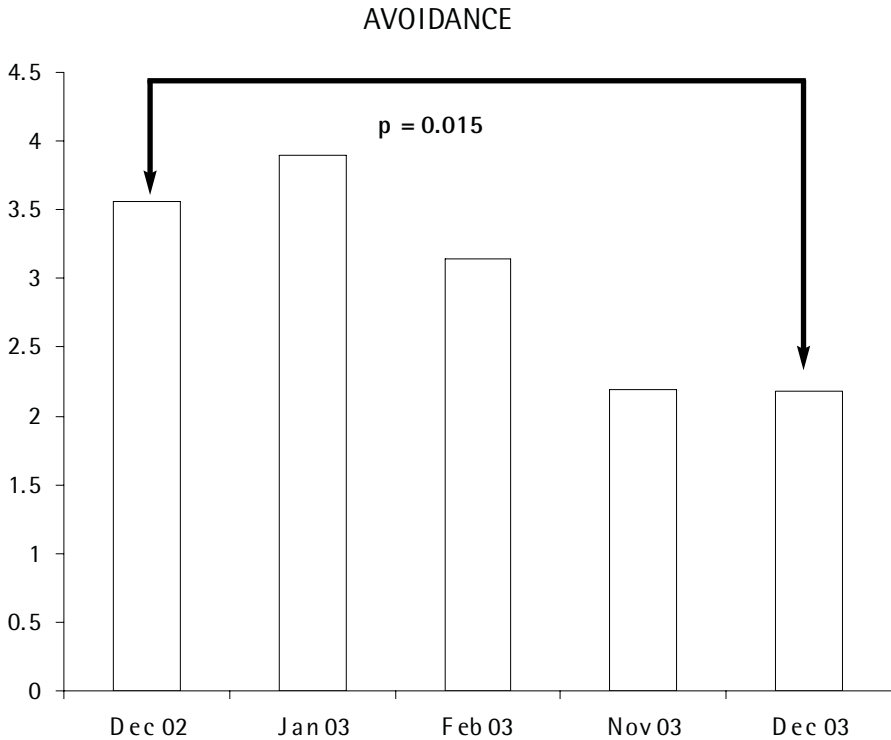


Figure 1: Trend of avoidance symptomatology December 2002–December 2003

have been impossible to change as the sample was determined by the circumstances of an emergency situation, and all of the affected children required treatment on an equitable basis. However, this limitation that prevented the research from meeting experimental parameters points at the same time to one of the strong points of the study, since it arises from a real-life crisis requiring an immediate and practical solution.

At the same time the lack of a control group raises the question of whether the measurable improvements reported might have been the result of spontaneous remission. That is, after a trauma of such severity, followed by a number of ongoing stressful events, recovery from PTSD might have shown a delay during the first few months, but with spontaneous recovery becoming apparent after that period, from February 2003 onwards. While the literature on the natural course of PTSD following disasters is limited, it nevertheless contains a number of

pointers to support the view that in this study the reduction in PTSD demonstrated the results of treatment. It has been noted above that in the 33-year follow-up by Morgan and her colleagues (2003) of the survivors of the Aberfan disaster in Wales the level of PTSD was still very high. Aberfan had a number of similarities to the disaster reported here. In October 1966 thousands of tons of colliery waste slid down a mountainside and buried a primary school, killing 116 children, half of the school population. In the study by Chemtob *et al.* (2002), a randomised control trial of EMDR with children traumatised following exposure to a hurricane, symptoms were still present three and a half years after the disaster.

Perkonig *et al.* (2005) conducted a longitudinal study of the natural course of PTSD in 125 adolescents and young adults and noted that, on follow up 34–50 months later, 48 per cent of the sample had shown no significant remission of symptoms. They

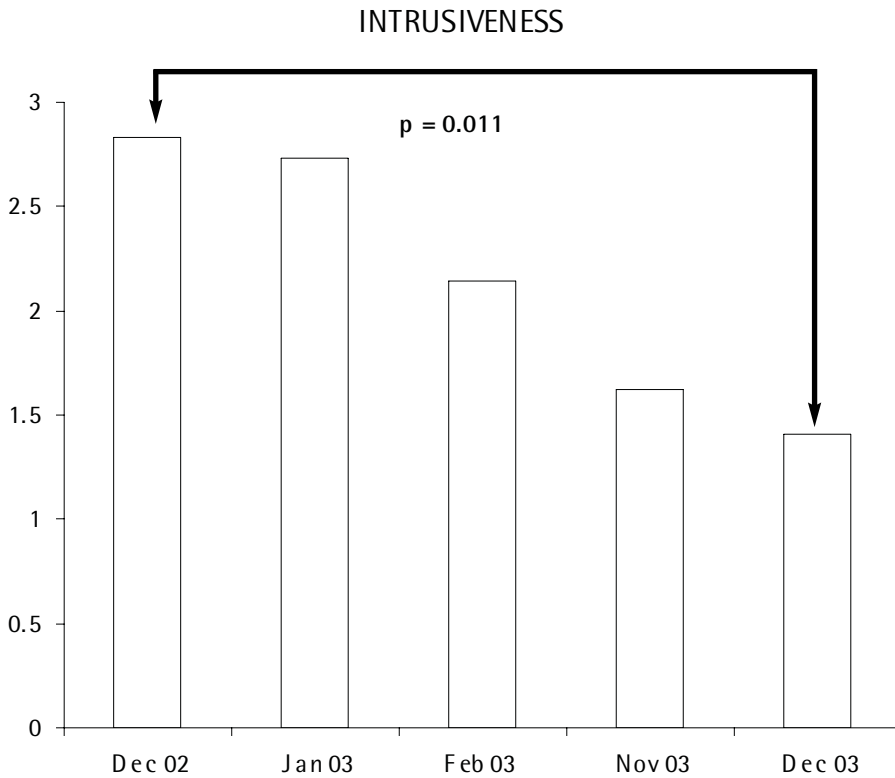


Figure 2: Trend of intrusiveness symptomatology December 2002–December 2003

concluded that PTSD is often a persistent and chronic disorder. After the Armenian earthquake of 1988, 95 per cent of children from a severely exposed city and 26 per cent of children from a mildly exposed city had severe levels of PTSD 1.5 years after the incident (Goenjian *et al.*, 1995). In a random sample of adults studied after the 1989 earthquake in Newcastle, Australia, the prevalence of PTSD had only decreased by about 50 per cent in the first two years after the event (Carr *et al.*, 1997). It is therefore reasonable to propose in the present study that a reduction from over 60 per cent of children meeting PTSD criteria to less than 10 per cent pointed to treatment effects rather than spontaneous remission.

It is important to remember that children and parents as well as the community involved in this disaster shared all post-traumatic reactions, mourning processes,

loss of homes, sense of guilt and conflicts arising in the community. It is well known that the anxieties of adults are perceived and absorbed by children and can become an obstacle in the resolution of psychological disorders. Many children said they were affected most of all by their parents' behaviour and display of emotions. Not only did EMDR treatment enable the resolution of the experience in an adaptive manner, but it also allowed the children to talk about their individual experiences, the most disturbing ones and the situations that became problematic after and because of the earthquake. After such a dramatic experience it is essential to be able to talk in a safe environment (provided by the therapist's presence) and express irrational ideas, images, physical sensations and emotions with words. The EMDR treatment focused also on helping the children experience the mourning processes

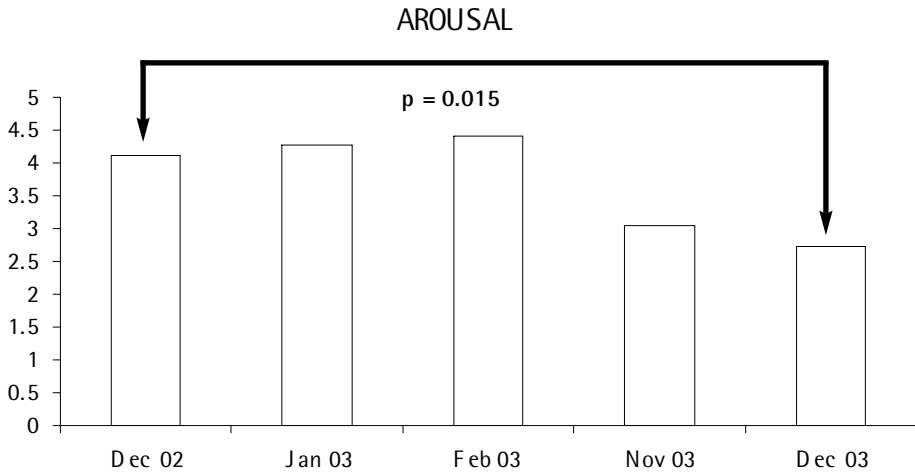


Figure 3: Trend of arousal symptomatology December 2002–December 2003

in a natural way, strengthening their resources, reducing stress reactions and normalising their behaviours.

Conclusions

This study has clear implications for the work of educational psychologists. As professionals who have constant contact with children and with schools they occupy a key position for providing support in these settings after

critical incidents. There have been very many accounts throughout the world of natural and other disasters affecting children, leading to significant levels of post-traumatic stress disorder. EMDR provides educational psychologists with an evidence-based therapy that can be used effectively in reducing these symptoms following critical incidents.

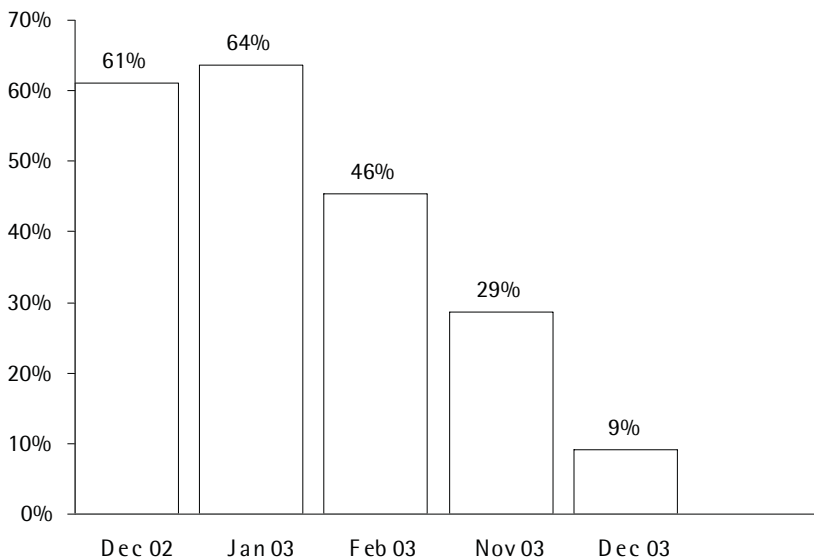


Figure 4: Proportion of sample meeting PTSD criteria

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