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A brief behavioural treatment of chronic post-traumatic stress disorder in earthquake survivors: results from an open clinical trial

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ABSTRACT

Background. Natural disasters such as earthquakes affect large numbers of people. Given the extent of the mental health problem following earthquakes, brief, effective and cost-effective treatment interventions are urgently needed. The present study examined whether cognitive-behavioural treatment could be shortened to a minimum number of sessions without undermining its effectiveness in post-traumatic stress disorder (PTSD).

Method. The study participants ($N=231$) were consecutive referrals to five project sites in the earthquake region in Turkey a mean of 13 months after the disaster. A modified behavioural treatment (BT) was used, which involved self-exposure instructions based on an enhancement of 'sense of control' rather than a habituation rationale and minimal cognitive interventions. The duration of treatment was variable, involving as many sessions as required for clinical improvement. Survival analysis was used to explore the minimum number of sessions required for clinical improvement, and multiple regression analysis to examine the predictors of outcome.

Results. The survivors received a mean of 4·3 sessions. Significant treatment effects and clinically meaningful effect sizes were noted on all measures. The treatment improved all PTSD and depression symptoms. The cumulative proportion of improved cases was 76% after one session and 88% after two sessions. No baseline variable predicted treatment outcome.

Conclusions. The modified BT appears to be promising as an effective one- or two-session intervention for earthquake survivors. It may be particularly useful in large-scale disasters as a cost-effective treatment that can be relatively easily disseminated to mass populations. Further research is needed to clarify the possible role of a treatment focus on sense of control in rapid recovery from traumatic stress.

INTRODUCTION

Earthquake is a common natural disaster, causing widespread destruction and death. Despite the evidence pointing to high rates of post-traumatic stress disorder (PTSD) in the affected communities (Goenjian *et al.* 2000; McMillen *et al.* 2000; Wang *et al.* 2000), no systematic efforts have been made to test the usefulness of available psychological treatments for earthquake survivors. Furthermore, no study has yet investigated the feasibility and effectiveness of brief psychological interventions in a post-disaster setting.

On 17 August, 1999 an earthquake measuring 7·4 on the Richter scale hit the Marmara region of Turkey. This was followed by a second earthquake (7·2 on the Richter scale) on 12 November, 1999. These disasters caused widespread devastation and exposed 20 million people to a wide range of traumatic events. Over 130 000 houses

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were reduced to rubble or severely damaged and 17 127 people died (Government Crisis Centre, 1999).

The present study is based on a project that was set up in September 1999 to provide psychological care for the survivors. It represents the first stage of our work towards two main objectives: (*a*) to develop a brief and effective treatment for earthquake survivors based on cognitive-behavioural principles (CBT); and (*b*) to develop cost-effective methods of disseminating the treatment to large numbers of survivors through self-help manuals, computerized treatment programs and other media. Cognitive therapy aims at reducing anxiety by changing maladaptive forms of thinking while behavioural treatment (BT) is based on the habituation principle that prolonged exposure to anxiogenic stimuli leads to a reduction in anxiety. There is abundant evidence to show that CBT is effective in PTSD (Foa & Meadows, 1997). Accordingly, CBT is widely regarded as the treatment of choice in PTSD (Ballenger *et al*. 2000). Out treatment model was based on a modified version of the exposure treatment used by Marks *et al*. (1998) and Foa *et al*. (1999) for PTSD.

Although CBT is a brief form of psychotherapy usually delivered in about 10 sessions, it is still too long in post-disaster circumstances where millions of people have been exposed to severe trauma. Faced with high rates of chronic PTSD (39 to 63%) in the community in the years that followed the disaster in Turkey (Başoğlu *et al*. 2002; Livanou *et al*. 2002*a*; Şalcıoğlu *et al*. 2003), we felt the need for a briefer intervention for this mental health problem. In the present study we examined how far CBT could be shortened without undermining its effectiveness. We hypothesized that CBT could be shortened without compromising its effectiveness by: (*a*) limiting cognitive interventions to the explanation of the treatment rationale only; (*b*) focusing on only one PTSD symptom, i.e. behavioural avoidance; and (*c*) shifting focus from habituation to anxiogenic stimuli to enhancement of 'sense of control' over traumatic stressors. The latter modification was based on two considerations: the evidence from human and animal literature suggests that loss of control over stressors is an important mediating factor in the development of anxiety and fear responses (Başoğlu & Mineka, 1992; Başoğlu *et al*. 1997); and, helping the person regain control over stressors might therefore reduce traumatic stress (Başoğlu & Mineka, 1992). We tested this hypothesis in an open clinical trial involving 231 earthquake survivors with chronic PTSD symptoms a mean of 13 months post-disaster by examining the minimum number of sessions required for significant clinical improvement.

METHOD

The study group ($N=231$) was drawn from consecutive referrals to the project sites that were based in three prefabricated housing establishments in the epicentre region ($N=48$) and two community centres ($N=183$), one in a town situated 3 km from the epicentre and the other in the suburb of Istanbul that was most severely affected by the earthquake. The clinical work took place between May 2000 and June 2001.

Inclusion criteria included age over 16, earthquake-related PTSD symptoms, no psychotic illness, no alcohol or drug dependence and willingness to receive BT. Survivors without PTSD were included in the study because many had 'subthreshold' PTSD and their exclusion would lead to loss of valuable information. Survivors who received additional drug treatment were also included, not because we wanted to test the efficacy of any particular drug, but rather to examine the relative effectiveness of a combined drug and BT approach in a post-disaster setting.

Eighty survivors (35%) received psychotropic drugs in addition to BT, including sertraline ($N=43$), fluoxetine ($N=11$) and others ($N=26$). Antidepressants were used only for depression with serious suicidal intent. In cases where depression was severe enough to undermine motivation for psychological treatment, BT was added after a few weeks of drug treatment. We have no reliable information on the prescribed dose of each anti-depressant but care was taken to maintain a therapeutic dose for 6 months, whenever possible.

Because we wanted to examine the minimum number of sessions required for improvement, the duration of treatment was not pre-determined. The assessments were planned to be weekly but this was not always possible because of irregular attendance due to high demographic mobility in the disaster region. The

between-session intervals were thus variable (mean 16 days, S.D. = 12). The treatment was terminated when significant clinical improvement (as judged by both the therapist and the survivor) was noted at any assessment. In cases where the survivor discontinued treatment prematurely, the last attended session was taken as the 'post-treatment' assessment point.

Two hundred and seventeen of the survivors (94%) were treated by nine psychologists and 14 (6%) by three psychiatrists. The psychologists had recently completed their undergraduate training in psychology and had no clinical training or experience in any form of psychotherapy including CBT prior to the study. They were trained by the first author within a month and supervised throughout the study by the psychiatrists who were experienced in BT. Compliance with treatment protocol was checked by examining each patient file, which included the minutes of the session, treatment targets, exposure homework tasks, and progress report regarding treatment targets achieved. The treatment was individual in 192 (83%) cases, in groups of five to eight in 34 (15%) and both ways in 5 (2%).

Treatment procedures

The first step in treatment involved identification of the presenting problems, which were most likely to be fear of earthquakes, re-experiencing, behavioural avoidance, and hyperarousal. The second step involved an explanation of treatment and its rationale. Instead of using a habituation rationale (Marks, 1987*a*) that emphasizes reduction in distress during treatment (e.g. '*stay in the situation until your anxiety subsides*'), the treatment focused on increasing 'sense of control' over distressing trauma reminders and associated emotional and/or behavioural responses. For example, fear was 'personified' by presenting it as an 'adversary' that needed 'fighting back.' A choice had to be made between 'surrendering' to fear and or 'defeating' it. Avoidance meant surrender and the consequence would be living the rest of one's life in fear and helplessness. The most effective way of 'defeating' fear would be 'confronting' it until one felt in control. Most survivors related to this discourse very well because of their pervasive fear and helplessness *vis-à-vis* their distressing trauma memories and ongoing after-shocks.

The third and final step involved treatment target setting and self-exposure instructions. The treatment targets involved four of the most functionally disabling problems such as avoidance of safe buildings, staying home alone, sleeping in the dark, taking a shower, going near sights of devastation or rubble, cemeteries and other such trauma reminders. Once agreement was achieved on the targets, self-exposure instructions were given. Whenever prolonged grief coexisted with PTSD, some of the targets related to grief symptoms. The therapist was never present during the exposure tasks. The subsequent sessions involved only a review of progress, troubleshooting, verbal praise for progress achieved and setting new homework tasks. No systematic cognitive restructuring was undertaken during treatment.

Measures

The measures included the Survivor Information Form (SIF) and the Traumatic Stress Symptom Checklist (TSSC) (Başoğlu *et al.* 2001). The SIF had 28 items concerning demographics, personal and family history, trauma characteristics, and intensity of fear during the earthquake (0 = none, 4 = extremely severe). The TSSC consisted of 17 PTSD and six depression symptoms, all measured on an intensity scale (0 = not at all bothered; 3 = very much bothered).

The TSSC was validated on 130 earthquake survivors in Turkey (Başoğlu *et al.* 2001). When the diagnosis of PTSD was based on a cut-off point of 25 in the total scores of the 17 PTSD items, the scale showed sensitivity of 0·81 and specificity of 0·81. The overall correct classification rate was 81%. Similarly, a diagnosis of major depression based on a cut-off point of 38 in the total scores of the 23 TSSC items yielded sensitivity of 0·83 and specificity of 73. The overall correct classification rate was 77%.

The Clinician-Administered PTSD Scale (CAPS) (Blake *et al.* 1990) and the major depressive episode (MDE) module of the Structured Interview for DSM-IV (SCID) (First *et al.* 1996) were also used as diagnostic tools. They were included in the study at a later stage so data on the CAPS and SCID-MDE were available on only 148 (64%) and 151 (65%) of the cases, respectively. In other cases, the diagnoses of PTSD and major depression were based on the TSSC.

The Fear and Avoidance Questionnaire (FAQ) was devised for the purposes of the project and included 35 activities or trauma reminders, each self-rated for the intensity of associated fear (0 = no fear/avoidance; 3 = extreme fear/avoidance). The main treatment targets – assessor and self-rated (Marks, 1986) measured the difficulty associated with confronting the four most avoided activities (0 = no difficulty; 8 = extreme difficulty). Other measures included the Turkish version (Hisli, 1987) of the Beck Depression Inventory (BDI) (Beck *et al.* 1974), the Turkish version (Kılıç, 1996) of the General Health Questionnaire (GHQ-12) (Goldberg & Hillier, 1979), and Work and Social Adjustment Scale (self- and assessor-rated) (WSA-S and WSA-A) (Marks *et al.* 1998). Overall clinical improvement was measured by Patients' Global Impression-Improvement (PGI) and Clinicians' Global Impression-Improvement (CGI) (Marks *et al.* 1998) (1 = very much improved; 2 = much improved; 3 = slightly improved; 4 = no change; 5 = slightly worse; 6 = much worse; 7 = very much worse). All clinical ratings were administered at baseline and subsequent treatment and follow-up sessions.

The therapists were standardized in the use of the CAPS and the SCID-MDE with an experienced psychiatrist in the team. The therapists and the psychiatrist jointly assessed five earthquake survivors and reached a concordance rate of over 90% in their ratings. Only verbal consent was obtained from the study participants because the treatment was given as part of a routine service delivery programme and no control condition was used.

Data analyses

Between-group comparisons were conducted using χ^2 tests for categorical and two-tailed t tests for continuous variables. Paired t tests examined the treatment effects on clinical ratings. Treatment effect size was computed by dividing the mean change in a clinical rating by the standard deviation of the change. The optimum number of treatment sessions required for improvement was examined by survival analysis (McNeil, 1996). A multiple regression analysis examined the predictors of treatment outcome.

RESULTS

The mean age of the study participants was 35 (S.D. = 11); 201 (87%) were women and 73 (32%) were married. Sixty-three (28%) survivors reported past psychiatric illness and 41 (18%) psychiatric illness in the family. Seventy-eight (34%) of the survivors had previous trauma experience. The study group included survivors with high trauma exposure. One hundred and nine (47%) survivors had their houses reduced to rubble or seriously damaged; 23 (10%) were trapped under rubble, 38 (17%) lost family member(s), 123 (54%) second-degree relatives, 191 (83%) friends and/or neighbours, 105 (46%) property, and 54 (24%) had participated in rescue work.

One hundred and sixty-seven (72%) survivors had PTSD, while 109 (47%) had major depression. Of the whole study group, 101 (44%) had both PTSD and depression and 56 (24%) had neither. The mean time since the earthquake was 399 days (S.D. = 100). Based on clinical assessment, 36 survivors (16%) had prolonged grief and a further 29 (15%) had co-morbid disorders such as panic disorder, generalized anxiety disorder and social phobia.

Fifty survivors (22%) discontinued treatment at various time points. Of these, 17 (32%) discontinued treatment after the first and 23 (46%) after the second session. The non-completers significantly differed from the completers on only one pre-treatment variable: they had less major depression at baseline (respectively 52% *v.* 30%, df = 1, $\chi^2 = 6.71$, $P < 0{\cdot}01$). The survivors had a mean of 4·3 sessions during treatment (S.D. = 2·6, range 1–17). All but four outlier cases had less than 10 sessions. Only the study participants that had at least one post-baseline assessment were included in the analyses, thus excluding 17 cases that were lost to treatment after baseline.

Clinical ratings and treatment effect

The mean scores on clinical ratings and the treatment effect sizes appear in Table 1. Pre- to post-treatment change was highly significant in all clinical ratings. All effect sizes in the group with PTSD were >1, suggesting a clinically meaningful treatment effect. The relatively smaller effect sizes on some measures in the

Table 1. *Improvement in clinical ratings at last assessment and follow-up*

Measures	PTSD group	Baseline Mean (S.D.)	Last assessment Mean (S.D.)	df	*t*	Effect size	Baseline Mean (S.D.)	Follow-up Mean (S.D.)	df	*t*	Effect size
MT-S†	+	6·7 (1·1)	1·3 (1·9)	150	31·5***	2·6	6·4 (1·2)	0·7 (1·0)	42	23·2***	3·6
	−	5·9 (1·2)	1·2 (1·6)	52	18·9***	2·6	‡	‡	‡	‡	‡
MT-A†	+	6·7 (1·0)	1·3 (1·8)	145	32·2***	2·7	6·3 (0·9)	0·7 (0·9)	41	28·2***	4·3
	−	6·0 (1·3)	1·3 (1·6)	48	18·1***	2·6	‡	‡	‡	‡	‡
TSSC	+	39·6 (11·1)	17·6 (11·8)	155	22·2***	1·8	40·7 (9·9)	12·9 (11·8)	60	17·7***	2·3
	−	24·0 (9·6)	12·2 (8·9)	57	10·3***	1·4	22·1 (7·6)	9·6 (5·2)	13	6·6***	1·8
FAQ	+	51·2 (18·4)	16·8 (16·4)	154	22·7***	1·9	52·5 (16·3)	10·7 (12·3)	60	17·7***	2·3
	−	35·6 (17·8)	13·5 (10·3)	56	11·0***	1·5	33·7 (18·1)	9·6 (8·8)	13	6·1***	1·8
BDI	+	21·4 (10·3)	10·0 (8·3)	150	14·1***	1·2	21·9 (9·9)	8·9 (9·1)	60	11·4***	4·5
	−	11·6 (6·9)	6·9 (7·0)	52	6·1***	0·8	9·3 (6·9)	3·5 (3·8)	10	2·8*	0·9
GHQ	+	10·3 (6·5)	2·9 (4·4)	148	14·7***	1·2	10·8 (6·2)	2·3 (4·5)	58	11·1***	1·0
	−	4·8 (4·5)	2·1 (3·4)	54	4·8***	0·6	3·9 (4·6)	0·9 (1·7)	12	2·8*	0·8
WSA-S	+	17·3 (8·8)	6·5 (7·1)	150	15·1***	1·2	17·7 (9·5)	5·3 (6·6)	59	10·1***	1·3
	−	9·4 (7·3)	3·6 (5·3)	55	7·2***	1·0	7·7 (5·8)	2·2 (4·4)	11	3·8**	1·1
WSA-A	+	18·6 (7·4)	5·8 (6·5)	150	19·0***	1·5	18·7 (7·8)	3·9 (5·9)	53	12·0***	1·6
	−	11·9 (7·8)	3·2 (5·2)	50	9·1***	1·3	14·9 (8·6)	2·4 (3·4)	10	5·9***	1·8
		N	Mean (S.D.)				*N*	Mean (S.D.)			
PGI	+	155	2·2 (0·8)				66	1·9 (1·0)			
	−	55	2·2 (0·9)				17	1·9 (0·7)			
CGI	+	152	2·0 (0·8)				64	1·7 (0·8)			
	−	56	1·9 (0·8)				15	1·6 (0·5)			

Last assessment, Last assessment session attended before the termination of treatment by the therapist or the patient.

MT-S, Main Treatment Targets-Self (0–8); MT-A, Main Treatment Targets-Assessor (0–8); TSSC, Traumatic Stress Symptom Checklist (0–69); FAQ, Fear and Avoidance Questionnaire (0–105); BDI, Beck Depression Inventory (0–63); GHQ, General Health Questionnaire (0–24); WSA-S, Work and Social Adjustment-Self (0–40); WSA-A, Work and Social Adjustment-Assessor (0–40); PGI, Patient's Global Impression-Improvement (1–7); CGI, Clinician's Global Impression-Improvement (1–7); +, patients with PTSD; −, patients without PTSD.

† Based on averaged Main Treatment Target ratings for each case.

‡ Data not available.

* $P<0{\cdot}05$; ** $P<0{\cdot}01$; *** $P<0{\cdot}001$.

group without PTSD could be explained by a ceiling effect due to lower baseline scores.

Follow-up assessments

Follow-up assessments were conducted on only 75 (32%) patients, mainly due to the difficulty in maintaining regular contact with the survivors in the disaster region. These assessments took place between 1 to 2 months in 46 survivors (61%), 2 to 3 months in 13 (17%), and 3 to 9 months in 16 (22%). The mean follow-up time for the whole group was 66 days (S.D. = 48).

As the 75 survivors who had follow-up might have reflected a select subsample that overestimated the long-term effectiveness of treatment, they were compared with those ($N=156$) who were not followed up on all demographic variables, trauma characteristics, pre-treatment clinical ratings, and CGI and PGI at the last available assessment. No significant between-group differences were found, suggesting that the follow-up results were not biased in favour of the treatment. Similar results were obtained when the 16 survivors who had 3- to 9-month follow-up were compared with those who were not followed up.

To examine the effect of treatment on individual symptoms, the percentage of cases who had a particular symptom at baseline and who recovered from that symptom was computed. Symptom presence was defined by a TSSC item score of 2 or 3 and recovery was defined as a drop in this score to 1 or 0. The percentages of recovered cases ranged from 74 to 77% for the re-experiencing symptoms, 79 to 86% for the avoidance/numbing symptoms, 64 to 83% for the hyperarousal symptoms, and 71 to 85% for the depression symptoms. The treatment thus had a 'patholytic' effect on all symptoms.

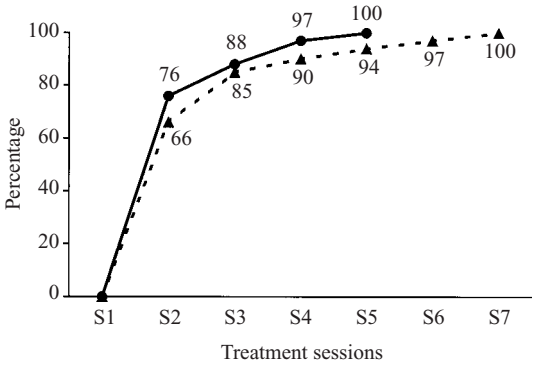

FIG. 1. Cumulative proportion of improved cases in groups with (●—●, $N=149$) without (▲----▲, $N=62$) PTSD.

A survival analysis examined the cumulative proportion of improved cases at each time interval between the treatment sessions. The criterion of improvement was a PGI rating of $\leqslant 3$. Although CGI was highly correlated with PGI ($r=0{\cdot}73$, $P<0{\cdot}001$), it was not chosen for this analysis to avoid possible assessor bias. This criterion corresponded to a substantial reduction in all clinical ratings (57% for TSSC, 69% for FAQ, 50% for BDI, 69% for GHQ, 62% for WSA-S, 71% for WSA-A, and 84% for both self- and assessor-rated main treatment targets). Among the cases with a TSSC diagnosis of PTSD or MDE, respectively 93% and 97% of those that met this criterion lost the diagnosis at post-treatment.

The cumulative proportion of improved cases in the groups with and without PTSD are shown in Fig. 1. The results were very similar in both groups. The cumulative improvement rates in the group with and without PTSD were respectively 76% and 66% after the first session and 88% and 85% after the second session. The median number of sessions required for improvement was 1·7 for the group with PTSD and 1·8 for the group without PTSD. Thus, it took about two sessions (or mean 26 days, S.D. = 19) to improve for the majority of the cases. Further examination of the PGI scores showed that, once improvement occurred, no patient relapsed (e.g. a PGI score >3) during treatment; relapse occurred in only one out of the 75 patients who had post-treatment follow-up assessments.

To examine if additional drug treatment further enhanced improvement in the group with PTSD, the analysis was repeated separately for those who received medication ($N=72$) and those who did not ($N=82$). The cumulative improvement rates were almost identical and the median number of sessions required for improvement was the same (1·7) in both groups. The cumulative proportion of improved cases in the drug and non-drug groups after two sessions were 89% and 85%, respectively. Thus, additional drug treatment did not speed up recovery. These analyses were not conducted in the group without PTSD because only six survivors had received additional drug treatment.

A multiple regression analysis (simultaneous entry method) examined the factors related to clinical outcome. The independent variables were age, sex, education (1–6), marital status, personal or family previous psychiatric illness, history of past trauma, presence of prolonged grief, presence of co-morbid illnesses, having been trapped under rubble, loss of family members, loss of second-degree relatives, loss of neighbours and/or friends, loss of property, participation in rescue work, additional drug treatment (all coded as 0,1), intensity of fear during the earthquake (0–4), time since trauma (days), number of days between baseline and last assessment, treatment modality (individual, group, or combined, each coded as a dummy variable) and the baseline TSSC and BDI scores as measures of illness severity. PGI at the last available assessment was used as the dependent variable. The total variance explained by all independent variables (R^2 change = 0·00) was not significant ($F(21, 156)=1{\cdot}00$, $P=0{\cdot}46$). None of the independent variables predicted clinical response.

DISCUSSION

We did not include a control group in our study for mainly two reasons. A controlled study was not possible under the difficult post-disaster circumstances at the time this work was conducted. Furthermore, we were more interested in how a 'standard' treatment with well-documented efficacy could be shortened without compromising its effectiveness. Nevertheless, the effectiveness of our treatment was supported by the large effect sizes on most measures. These effect sizes were comparable to those achieved by 10

sessions of exposure in a randomized controlled trial of CBT in PTSD (Marks *et al.* 1998).

Given the previous evidence on the efficacy of BT, the high rate of improvement in our study group is not surprising. What is interesting, however, is that such improvement in chronic PTSD could be achieved in a few sessions. This might simply reflect the fact the greatest proportion of improvement achieved by BT usually occurs within the first few sessions (Marks *et al.* 1988, 1993). On the other hand, the treatment's focus on enhancement of sense of control rather than on habituation might also have contributed to its effectiveness. This is consistent with the evidence that loss of control over stressors is a mediating factor in anxiety and with the view that a reversal of this process might enhance improvement (Başoğlu & Mineka, 1992). Indeed, sense of control also relates to long-term maintenance of improvement in patients treated for panic disorder with agoraphobia (Başoğlu *et al.* 1994) and PTSD (Livanou *et al.* 2002*b*). This explanation, however, is only tentative and needs to be confirmed by a study comparing the two approaches in BT.

Another finding of interest is that all PTSD and depression symptoms improved when treatment focused on only one PTSD symptom: behavioural avoidance. This does not support the view that BT is less effective in reducing the 'negative' symptoms of PTSD, such as amnesia, numbing, and detachment (Keane *et al.* 1992). Whether this finding is related to a sense of control focus in treatment deserves further study.

Although only 32% of the study group could be followed up after treatment, there was no evidence to suggest that the follow-up results were biased in favour of the treatment. Improvement was remarkably stable, given that 74 of the 75 cases with 1- to 9-month follow-up maintained treatment gains. Of the 16 cases with 3- to 9-month follow-up (7% of the whole sample), only one relapsed. These findings are in line with evidence that exposure leads to stable gains in the long-term (Marks, 1987*b*). Further work is needed, however, to confirm the long-term outcome of treatment.

The fact that treatment was effective and relapse in the medium-term was extremely rare despite additional traumatic stress caused by ongoing aftershocks during the study suggests that the treatment had a resilience-building effect. Our treatment may thus be particularly effective in ongoing traumatic situations where fear of ongoing threat to safety is a prominent problem. This is consistent with some case studies of torture survivors (Başoğlu & Aker, 1996; Başoğlu *et al.* 2003), which suggest that modified BT can reduce PTSD despite an environment that carries realistic threats to safety. This is also consistent with evidence (reviewed by Başoğlu & Mineka, 1992) that learning that one has control over aversive stimulation can immunize the organism against the later effects of exposure to uncontrollable aversive stimulation.

That no pre-treatment factor predicted treatment outcome might be explained by reduced variability in the outcome measures caused by large treatment effect sizes. Prolonged grief did not relate to poorer outcome, because the treatment also targeted grief symptoms, whenever necessary. The reduction in grief-related main treatment target scores indicated that these symptoms responded equally well to BT.

The lack of an additional benefit from drug treatment might be explained by a ceiling effect related to rapid recovery achieved by BT in about 93% of the cases after four sessions. This finding does not thus imply anything about the efficacy of the drugs used in our clinic. It merely shows that the improvement in our patients was not due to drugs. This finding also suggests that antidepressants are not a useful addition to BT of earthquake-related PTSD, given the rapid recovery achieved by BT.

Finally, our choice of behavioural over cognitive treatment in our fieldwork with disaster survivors deserves some explanation. We needed to minimize therapist involvement in treatment, given the enormous demand for help from thousands of survivors with chronic PTSD. This could be achieved with BT by limiting the intervention to target setting, self-exposure instructions, and subsequent monitoring. Secondly, it was easier to train therapists in BT than in cognitive therapy. Indeed, we were able to train clinically inexperienced psychologists in effective delivery of modified BT within 1 month. This is particularly important in developing countries where training facilities are scarce. Thirdly, we observed in our fieldwork that it was easier to conduct BT with survivors from a lower socio-educational background. Finally, the simplicity of the modified BT and the ease

with which it can be effectively delivered made it ideally suited for cost-effective dissemination through other media such as manuals, videotapes, or computerized treatment programs. Indeed, with the use of a BT manual we have obtained encouraging results from a pilot study.

In conclusion, our treatment model appears to be useful as a brief intervention for chronic PTSD in earthquake survivors. Further work is needed to examine whether the treatment is effective in preventing PTSD when administered in the early aftermath of trauma. Modified BT may also be effective in survivors of other types of trauma because behavioural avoidance and distress related to trauma reminders are common symptoms in trauma survivors.

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