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Somatic Therapy Treatment Effects with Tsunami Survivors

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This is an uncontrolled field study of the outcome effects of a somatically based therapy with tsunami victims in southern India. One hundred and fifty (150) participants, prescreened for trauma symptoms, received 75 minutes of somatic therapy and training in affect modulation and self-regulation. The results indicate a reliable and significant treatment effect at immediate, 4-week, and 8-month follow-up assessments. At the 8-month follow-up, 90% of participants reported significant improvement or being completely free of symptoms of intrusion, arousal, and avoidance. The results support the effectiveness and reliability of this modified version of Somatic Experiencing Therapy in working with trauma reactions and invite future controlled trials of this therapy.

Keywords: posttraumatic stress; somatic therapy; somatic experiencing therapy; IES; post-tsunami symptoms

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This is a study examining the durability of a somatically based treatment approach to trauma on survivors of the devastating tsunami that hit southern India in the Tamil Nadu region in 2004. Catastrophic natural events such as this one produce high levels of terror, fear, despair, and loss, much of which eventually lead to the development of posttraumatic stress disorder (PTSD). PTSD

is among the most common psychological reactions in survivors of disasters (Reyes & Elhai, 2004), but those who survive are also at risk for developing a variety of health problems and other psychological disorders, such as anxiety, depression, and substance abuse (American Psychological Association, 2006). In addition, studies suggest that PTSD has other serious and lasting effects, which include nonspecific stress, chronic problems in relationships, psychosocial resource losses, and problems specific to youth, such as separation anxiety, violence, and eating disorders (Norris, Perilla, & Murphy, 2001; Reyes & Elhai, 2004).

The rates of PTSD among survivors can vary significantly depending on the sample studied and the type of disaster (van der Kolk, McFarlane, & Weisaeth, 1996). But we know that situations where sudden, unpredictable life-threatening events pervade a community (such as hurricanes, tsunami, violence or floods, etc.) are likely to produce high levels of PTSD (Karamustafalioglu et al., 2006). For example, individuals involved in the Buffalo Creek disaster, where a dam broke and flooded an entire community, had a 59% incidence of PTSD symptoms among survivors and a lifetime rate of 25% symptomatic at a 14-year follow-up. Likewise, participants in the Vernberg, LaGreca, Silverman, and Prinstein (1996) study of factors predictive of PTSD symptomotology following Hurricane Andrew revealed effects on all five identified factors used to predict or mitigate PTSD development: frightening event, loss/disruption, social support, coping strategies, and supportive social environment. The hurricane caused most of these factors to occur, and, as expected, 86% of the children studied reported mild PTSD symptoms whereas 55% reported moderate to severe levels of symptoms. The tsunami that spread across Southeast Asia, India, and Africa was one of the deadliest natural disasters in history. The result was a death toll of more than 320,000 individuals (Bronisch et al., 2006). In studies of survivors, the following symptoms have been noted: dissociation, hyperarousal, flashbacks, sleep disturbances, illusions, loss of appetite, grief, suicidality, and difficulty concentrating (Bronisch et al., 2006).

According to Somatic Experiencing Therapy, a neurobiology-based somatic approach to working with trauma, trauma resides in the nervous system and not in the event itself (Heller & Heller, 2004). Lower brain centers become engaged during threatening events and executive functions become less active. A dominant neurological reaction occurs involving orienting, fight, flight, or freeze reactions. These reactions are conditioned to aspects of the life-threatening event and subsequent exposure to similar events can trigger an involuntary portion of the terror reaction in the body (Ledoux, 1996). Bodyoriented approaches, such as Somatic Experiencing Therapy (Levine & Frederick, 1997), attempt to gain careful access to these involuntary responses, build awareness of the bodily reactions, and actually “process” them to an “adaptive resolution.” Descriptive and subjective data collected in Thailand on tsunami survivors using Somatic Experiencing Therapy showed that immediately after this therapy 67% of the participants reported partial or complete remission and 90% reported partial or complete improvement at a 1- year follow-up (Leitch, 2007).

With this in mind, we set about using a modified form of Somatic Experiencing Therapy with survivors of the southern India area of Tamil Nadu where devastation was enormous. This study is the report of that effort. A more detailed description of the project may be obtained online (Selvam, 2005).

Method

Participants

The participants were 204 volunteers from 13 fishing villages in 3 districts (Nagapattinam, Cuddalore, and Vilupuram) in Tamil Nadu. The final count, however, for these analyses was 150 participants, because the Vilupuram district did not receive all follow-up assessments and therefore was not included here. Of the 150 participants, 40 were men and 110 were women, with a mean age of 41.6 years. Participants had responded to notices and advertisements in local venues asking for volunteers who had been affected by the tsunami and wanted treatment. Each

trauma team member met individually with each participant for approximately 75 minutes.

Prior to treatment contact, each participant was asked to complete a brief set of assessment questionnaires. These questionnaire responses, before and after treatment, and at 4-week and 8-month follow-ups, constitute the data for this study. First, a 17-item Post-Tsunami Symptom Checklist was completed for symptoms that occurred after the tsunami. The Post-Tsunami Symptom Checklist items identified possible emotional and bodily stress reactions that had been gleaned from reports by tsunami survivors from nearby villages. Reliability measures were not taken on this list, but we assume there was good face and construct validity because of the nature of the item selection. Responses to this checklist were coded as dichotomous yes or no answers. Second, 5 of the 17 checklist items were taken from the Impact of Events Scale–Revised–Abbreviated (IES–R–A). These items provided a separate measure closely linked to the *Diagnostic and Statistical Manual of Mental Disorders* (fourth edition, text revision; American Psychological Association, 2004) main criteria for PTSD (see Horowitz, Wilner, & Alvarez, 1979) in terms of intrusion, hyperarousal, and avoidance criteria. Only volunteers who scored (i.e., said yes to) more than 8 of the 17 items were taken as treatment participants and assumed to be experiencing trauma-related symptoms and assumed to be under personal stress at the time of treatment. Third, a Presenting Post-Tsunami Symptoms completion task asked each participant to list up to three presenting symptoms from which they wanted relief from and whether they had received any medical attention for the same. Almost all tsunami survivors treated had received medical attention for their symptoms but without lasting relief to their symptoms. Because the number of presenting symptoms identified varied from one to three for each participant, the symptoms were combined and averaged into one score for each participant. Fourth, Overall Stress Improvement (change in overall stress from the tsunami), Presenting Symptoms, and IES–R–A

items were measured with a modified Subjective Units of Distress (SUD) scale after the treatment and at each follow-up (Wolpe, 1990). The modified SUD units in this study, because of the nature of the population, ranged from 0 to 4, with 0 =*worse*, 1 =*same*, 2 =*somewhat better*, 3 =*a lot better*, and 4 =*completely well*. Additionally, at the 8-month follow-up alone, participants were asked to judge percentage changes in Overall Stress Improvement, Presenting Symptoms and IES–R–A items using 0 to 100 paises (in local currency, 100 paises equal 1 rupee). The Overall Stress Improvement scores were treated as a self-report global measure of overall change since treatment in their capacity for self-regulation and were treated as separate from changes in specific symptoms. At only the 8-month follow-up participants were asked to indicate their type of family, marital status, education, occupation, and types of loss experienced during the tsunami.

Design and Procedure

All participants received a modified[1] form[2] of Somatic Experiencing Therapy treatment from therapists trained for 3 years or more in this work. In all, 11 therapists participated, and assignment of respondents was on a random basis. Name, age, and sex of the participant were coded, but more personal questions were considered intrusive and insensitive in this culture and were not asked at this first session. A four-stage treatment protocol was developed for this single treatment intervention, and all therapists adhered to the protocol as judged by supervisor observations and therapist reports. The protocol consisted of four distinct stages. The first stage focused on containment of physiological arousal associated with tsunami and the aftermath experiences. Containment involved increasing awareness of bodily arousal reactions while, at the same time, building feelings of being grounded and connected and safe with the therapist. Bodily reactions were purposely slowed to avoid anxiety bursts. This first phase was emphasized in the treatment and participants were asked to practice it after the treatment session on a regular basis. Second, narratives were built of the tsunami experiences for what was remembered, felt, what

they did or did not do, and, most important, what they sensed in their bodies in the remembrances. “Pendulation” of awareness between being grounded and being safe and the terror-survival responses in their bodies was established on a gradual basis (Levine & Frederick, 1997). Pendulation eventually allowed for processing or release of these involuntary body reactions associated with the event. Third, participants were educated (as they pendulated) on the neurophysiology of stress and trauma in a simple manner that emphasized how the body stores experience and does not release it until the conditions are proper. Education was also aimed at normalizing the experience away from judgments and pathological categorizations and at emphasizing the need to practice regularly after the treatment experience. Finally, tracking of bodily experience helped guide participants toward discharge and better self-regulation of the body experience and state. Tracking the changes helped them see actual resolution of body-held experiences as a standard for future more stress-free behavior.

At each follow-up session, participants were asked to rate changes in Presenting Post- Tsunami Symptoms identified at the first session on a 5-point SUD-type scale previously described.

Changes since the treatment in the items on the IES–R–A scale as well as their global Overall Stress Improvement were also rated on the 5-point scale at each follow-up. Two Indian field workers, trained in scale administration, conducted each follow-up session on an individual basis with participants. All questionnaire items and instructions had been translated into Tamil prior to data collection so that comprehension was not a problem.

The data were collapsed into three broad categories related to Degree of Loss and Degree of Traumatization for purposes of data analysis. Degree of Loss was partitioned into low, medium, and high ranges with low being 1 (*loss of family*, *property*, *financial status, injury, or witness to significant loss*), medium being 2 or 3, and high being 4 or 5 types of loss. Degree of Traumatization was determined by the number of yes symptoms checked on the Post-Tsunami Symptom Checklist. Here low represented 8 to 10 symptoms checked, medium represented 11 to 12, and high represented 13 or higher. Thus, two new variables were created, Degree of Traumatization and Degree of Loss.

Results

The three primary dependent variables in this study were the Presenting Post-Tsunami Symptoms scores, Overall Stress Improvement scores, and the IES–R–A scores. Using SPSS, a mixed design analysis of variance (ANOVA) was performed for each dependent variable to determine changes during three assessment periods (immediate, 4 weeks, and 8 months). The grouping variables were by district, gender, Degree of Loss, and Degree of Traumatization. Assumptions regarding normality of sampling distributions, homogeneity of variance–covariance matrices, linearity, and multicollinearity were met in all cases.

The Time (of assessment) effect on Presenting Post-Tsunami Symptom scores was significant, $F(2, 118) = 14.42$, $p < .05$, partial $\eta^2 = .20$, indicating reliable improvement during the three follow-up assessment periods. Likewise, there was a significant district-by-time effect on Presenting Post Tsunami Symptom scores. Cuddalore improved at a greater rate than Nagapattinam, although both showed significant improvement. The test for gender effects was not significant and Degree of Loss and Degree of Traumatization scales did not show differential effects over Time although all levels of these variables improved significantly over Time.

A mixed-design ANVOA was performed on the IES–R–A ratings at the 4-week and 8-month follow-ups but not the immediate post-treatment assessment. The post-treatment assessment was not considered an appropriate and meaningful measure because participants could not report on experiences that they had not yet had (such as sleep difficulties, etc.). District, gender, and Degree of Loss were used as grouping variables. Degree of Traumatization contained the IES–R–A items

so it was excluded from this set of analyses. There was a significant Time effect on IES–R–A scores, indicating reliable improvement over Time. However, district, gender, and Degree of Loss were not associated with IES–R–A score improvement over Time.

The SUD ratings measuring Overall Stress Improvement produced significant effects by district, with Cuddalore showing greater improvement than Nagapattinam, $F(1, 148) = 8.64$, $p < .05$, partial $\eta^2 = .06$. Sex of the participant was not significant with Overall Stress Improvement over Time but Degree of Loss did show an interactive effect, $F(2, 294) = 8.26$, $p < .05$, $\eta^2 = .05$, with high and medium scores making greater improvement than low scores on Degree of Loss. Degree of Traumatization did not interact with Time but Overall Stress Improvement showed significant and sustained improvement over Time, $F(2, 146) = 6.88$, $p < .05$, $\eta^2 = .09$.

Improvement Ratings

In Table 1, the frequency distributions of self-reported changes on Presenting Post-Tsunami Symptoms across participants at the 4-week and 8month follow-ups are presented. At 4 weeks, the participants reported that 74.2% of the presenting symptoms were somewhat better, a lot better, or completely resolved. At 8 months, the corresponding percentage was higher at 85.2%. In Table 2, the frequency distribution of percentage changes in the variable Overall Stress Improvement (improvement in overall stress from the tsunami), measured only during the 8-month follow-up, is presented. A total of 94.4% of the respondents at the 8-month follow-up reported 50% or more improvement in their overall level of stress from the tsunami.

Table 1. Participant Ratings on Improvement on Post-Tsunami Symptoms on Modified SUD at 4-Week and 8-Month Follow-up

Rating Category	4 Weeks	8 Months
0 =Worse	5.6%	10.7%
1 =The same	20.3%	4.1%
2 =Somewhat better	28.0%	16.4%
3 =A lot better	24.5%	41.8%
4 =Completely well	21.7%	27.0%

Note: SUD =Subjective Units of Distress scale.

Table 2. Participant Ratings of Improvement in Overall (Global) Life-Stress Levels Since the Treatment (8 Months Prior)

Degree of Overall Stress Improvement	Participants (%)
25% to 49%	5.5
50% to 69%	19.2
70% to 89%	44.0
90% to 100%	31.2

IES–R–A Data

The IES–R–A scale measures the three core PTSD symptoms, namely, arousal, intrusion, and

avoidance. “Jumpiness” and “watchfulness” were two items related to *arousal*. At each follow-

up, participants were asked to assess the extent of change they have experienced in the symptom (item) since the treatment. At the 8-month follow-up on the 5-point improvement scale, 33.6% of participants reported feeling somewhat better, whereas 58.8% reported feeling a lot better or completely well on jumpiness. Additionally, 32.2% reported being somewhat better on watchfulness at 8 months, and an additional 62.8% were a lot better or completely well from feeling watchful. In contrast, before treatment began, 71.2% of participants said yes to feelings jumpy and 74.7% said yes to experiencing watchfulness.

In terms of *intrusion*, both “sleep difficulties” and “recurring thoughts” assessed this dimension. Sleep difficulty was common to participants (79.7% said yes at pretreatment), and yet at the 8-month post-treatment follow-up, 22.1% reported being somewhat better and 76.2 reported being a lot better or in complete remission (completely well). Recurring thoughts were ascribed to by 73.8% of participants at pretreatment, but at the 8-month follow-up assessment, 28.3% were somewhat better and 63.3% were a lot better or completely well from recurring thoughts.

Avoidance was assessed directly by one question, and 52.4% positively ascribed to avoiding reminders of the trauma. At the 8-month follow-up, 27.7% reported feeling somewhat better, and 64.6% said that they were a lot or completely nonavoidant at that time.

Discussio
n

Field research studies following natural disasters invariably have many flaws and incomplete aspects because of the changing subject population, the trauma of separation and living in artificial and often inhospitable environments, the break down of social support systems, and general chaos that occurs when physical, social, and psychological environments are suddenly disrupted or destroyed. This study suffers from many of these outside factors that can contaminate data collection, results, and conclusions. In this case, however, because of the rather large number of participants and the systematic manner in which data were collected, some conclusions can safely be made.

The first and strongest conclusion from the results is that the somatic treatments were followed by significant improvements, as determined by subject reports, on all the major dependent variables and that these improvements were durable and continuous even after 8 months following intervention. This supports the use of Somatic Experiencing Therapy with trauma victims, especially those who suffered major catastrophic and sudden upheaval and, hopefully, will encourage future research with somatically based therapies. On every measure over Time (the three assessment periods), there was improvement that persisted through the last 8-month follow-up. This is a significant finding and a validation of Somatic Experiencing Therapy—one of its first systematic validations. Long-term follow-ups are almost universally absent from trauma

treatment research and yet they are critical for establishing treatment validity and reliability. Another feature of long-term follow-up, particularly 8 months after seeing a therapist, is that any inflation in scores because of attention or trying to please the therapist is minimized because of the great time span between therapy contact and the 4-week and 8-month assessments.

The second conclusion is that although the two districts showed significant long-term improvement, Cuddalore district had consistently greater rates of improvement than Nagapattinam. Nagapattinam had greater devastation, losses, and community disruption than Cuddalore and therefore may have had greater trauma and a higher ceiling for change. On the other had, when we separate all participants into Degree of Loss and Degree of Traumatization, there were main effects in improvement but no differential levels or interactive effects on these

variables. So, perhaps Cuddalore had an indigenous quality that better supported this treatment approach: Any of the factors, including education, sense of their bodies, willingness to practice, or others, could have contributed to the differences observed. Certainly, Cuddalore had much less social and residential disruption. What led to these differences is important to understand and will obviously require further study.

The Degree of Loss and Degree of Traumatization scales and levels were probably unnecessary because they did not contribute to the results in any meaningful manner. Although these scales had face validity, they lacked prior testing for external validity and reliability. In many respects, the degrees of loss and trauma may not be the result of absolute losses and absolute number of symptoms. Our tendency is to believe that the greater the experience, the more the trauma. This may not be the case. As Taylor, Kuch, Koch, Crockett, and Passey (1997) point out, a general mechanism or higher-order factor appears to be at work with PTSD leading to specific sets of symptoms. The absence of significant effects in terms of the Degree of Traumatization variable might also have been due to the lack of variability in that independent variable. Only participants who said yes to 8 or more symptoms on the 17-item Post-Tsunami Symptom Checklist were treated and trained.

There were also no gender differences in outcome or improvement. This would mean that both men and women practiced and benefited from the self-regulation procedures taught to them in the intervention session. But because we have no reliable measure of practice, we do not know the exact role practice played in the results. However, field observations and partial practice data would indicate that those who benefited the most had practiced the most. Unfortunately, this is the frustration of field research and the slow discovery has to occur over many tragedies and follow-up research projects.

Overall, we have significant improvement associated with the Somatic Experiencing Therapy. Ratings of change since the treatment indicated that 85.2% of participants experienced improvement from the initial presenting tsunami symptoms. Some 68.8% of total participants reported feeling a lot better or completely well at the 8-month assessment in terms of presenting symptom reduction in the long run since the treatment. Studies of spontaneous remission (e.g., Karamustafalioglu et al., 2006) in a similar situation reports very little spontaneous remission

within 1 year (on earthquake survivors), suggesting that these results are more a function of treatment and less a function of remission effects. Likewise, a follow-up study of PTSD with survivors of the Oklahoma City bombing concluded that all "PTSD was chronic (89% unremitted at 17 months) . . . pointing to a need for early intervention" (North et al., 2004). Although self-reported and without a control comparison, these reports suggest that a very positive and durable treatment effect was observed. Hopefully, these results will provide reason for conducting controlled trials of Somatic Experiencing Therapy in the future. The fact that there was a differential rate of improvement between the two districts suggests that gains were not just a function of uncontrolled temporal factors. A control would have better answered this question but controls are not always possible in field research, especially in post-disaster settings. Actual physiological measures of changes would also have contributed to our conclusions, and these are planned for future studies. For now, we have to rely on self-reported changes.

The IES–R–A data show a substantial pattern of improvement on core PTSD symptoms, further verifying positive treatment effects. Overall, 80% of the participants said yes to the experience of one or more core PTSD symptoms of arousal or intrusion and 50% said yes to avoidance reactions. However, at the 8-month follow-up, more than 90% improved significantly or were completely free of symptoms of intrusion, arousal, or avoidance. Again, this strengthens our contention that the Somatic Experiencing Therapy had helped in successfully resolving or healing target PTSD reactions.

That PTSD is a frequent outcome of natural catastrophes has been documented in prior

research (e.g., Bronisch et al., 2006, for tsunamis; Norris et al., 2001; Grainger, Levin, Allyn-Byrd, Doctor, & Lee, 1997, for hurricanes; van der Kolk et al., 1996, for volcanoes; Kisac, 2006; Konuk et al., 2006, for earthquakes). Reyes and Elhai (2004) assert that time is precious in post-disaster settings, and immediate intervention is necessary. Although this assertion has not been supported by controlled research, this study found that improvement of symptoms related to the tsunami could be achieved when intervention occurred as much as 6 months after the tsunami. Subsequent intervention projects were conducted 1 and 2 years later by these authors (RMD and RS) among different sets of tsunami survivors, and preliminary data including comparisons between treatment and control groups and between those who practiced self-regulation after treatment and those who did not suggest a very robust treatment effect. These data will be presented in future publications. Furthermore, immediate intervention is often complicated by participant shock, the chaos in relocating, breakdowns in information and communications, and an outer survival focus that makes it difficult to sense body sensations and feelings. As an example, Leitch, Vanslyke, and Allen (2007) report the results of an intervention with New Orleans aid workers from Catholic Charities who reported PTSD symptoms soon after Hurricane Katrina. Although psychological symptoms for both treatments and controls increased at the 4 month follow-up, the increases in scores of the treatment group were statistically lower than those of the comparison group. The authors speculate that the approach of another hurricane season and disruption may have triggered increases in symptomatology in both groups. However, Leitch (2007), in a more recent small exploratory study, found continued long-term gains in Thailand

tsunami survivors with intervention after only 1 month. Thus, the issue of best intervention timing is open and may primarily depend on circumstances rather than time of treatment.

The results of this study suggest that Somatic Experiencing Therapy is an effective approach for treating trauma-related reactions and PTSD. We hope that the results of this study will stimulate controlled research on Somatic Experiencing Therapy. Furthermore, the treatment approach used here focused on the introduction of psycho-educational information related to the involuntary nature of trauma symptoms and on participant practice subsequent to intervention. It is also important that treatment was for just 75 min, which indicates the effectiveness of this particular protocol on dysregulation from trauma.

Notes

1. Treatment followed the standard Somatic Experiencing protocol except that an educational component (body reaction to stressors) and practice were added with this population because of the brief contact time available.

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