

Somatic Therapy Treatment Effects with Tsunami Survivors

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This is a field study of the empirical effects of a somatically-based therapy with tsunami victims in southern India. One-hundred and fifty (150) participants, pre-screened for trauma symptoms, received one and a quarter hour 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.

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 Disorders (PTSD). PTSD is among the most common psychological reaction 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 (APA, 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).

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. 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 study (1996) of factors predictive of PTSD symptomatology 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 children studied reported mild PTSD symptoms while 55% reported moderate to severe levels of symptoms. The tsunami which spread across Southeast Asia, India and Africa was one of the deadliest natural disasters in history. The result was a death toll of over 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©, 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). Body-oriented 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 one-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 on-line (Selvam, 2005).

Method

Participants

The participants were 204 volunteers from thirteen fishing villages in three districts (Nagapattinam, Cuddalore and Vilupuram) in Tamil Nadu. The final count, however, for these analyses was 150 participants because the Vilupuran district did not receive all follow-up assessments and therefore was not included here. Of the 150 participants, 40 were men and 110 women with a mean age of 41.6 years. Participants had responded to notices and ads 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 one hour and 15 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 four-week and eight-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 due to the nature of the item selection. Responses to this Checklist were coded as dichotomous “yes” or “no” answers. Second, five 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 DSM 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) over 8 of the 17 items were taken as treatment participants and assumed to be experiencing trauma related symptoms and under personal stress at the time of treatment. Third, a Presenting Post-Tsunami Symptoms completion task asked for up to three presenting symptoms from each participant that “they wanted relief from” and whether any had received medical attention for such. Almost all tsunami survivors treated had received medical attention for their symptoms but without lasting relief to their symptoms. Because number of presenting symptoms identified varied from 1 to 3 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 Scale (SUDs) after the treatment and at each follow-up (Wolpe, 1969/1990). The modified SUDs units in this study, because of the nature of the population, ranged from zero to four with 0 representing “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 Presenting Symptoms, Overall Stress Improvement, and IES-R-A items using 0-100 paises (in local currency, 100 paises equal one Rupee). 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 eight-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 form of Somatic Experiencing Therapy treatment from therapists trained for three years or more in this work. In all, 11 therapists participated and assignment of subjects was on a random basis. Name, age and sex of 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 with the therapist and safe. 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 didn't do, and, most importantly, what they sensed in their bodies in the remembrances. "Pendulation" of awareness between being grounded and 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 doesn't release it until the conditions are proper. Education also was 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 five-point SUDs-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 five-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 comprehension was not a problem.

The data was 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 one loss of family, property or financial status; "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 8-10 symptoms checked, “medium” eleven to twelve, and “high” thirteen or higher. Thus, two new variables were created called 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, and the IES-R-A scores. Using SPSS, a mixed design ANOVA was performed for each dependent variable to determine changes over 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 ($F(2,118)=14.42, p<.05, \text{partial } \eta^2=.20$) indicating reliable improvement over 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 four week and eight 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 they had not yet had (such as sleep difficulties, etc.). District, gender and Degree of Loss were used as grouping variables. The 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 SUDs ratings measuring Overall Stress Improvement produced significant effects by district with Cuddalore showing greater improvement than Nagapattinam ($F(1,148)=8.64, p<.05, \text{partial } \eta^2=.06$). Sex of 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 four-week and eight-month follow-ups are presented. At four weeks, the participants reported that 74.1% of the presenting symptoms were somewhat better, a lot better, or completely resolved. At eight 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 eight-month follow-up is presented. 94.4% of the respondents at the eight-month follow-up reported 50% or more improvement in their overall level of stress from the tsunami.

Insert Tables 1 and 2 about here

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 five-point improvement scale, 33.6% of participants reported feeling “somewhat better” while 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 pre-treatment) 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 pre-treatment 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 “somewhat” better and 64.6% said they were a lot or completely non-avoidant at that time.

Discussion

Field research studies following natural disasters invariably have many flaws and incomplete aspects due to 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 was collected, some conclusions can safely be made.

The first and strongest conclusion from the results is that the somatic treatments led to 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 lends empirical support to the use of Somatic Experiencing Therapy with trauma victims, especially those who suffered major catastrophic and sudden upheavals. 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 empirical 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 due to 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 while the two districts showed significant long-term improvement the 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: education, sense of their bodies, willingness to practice...any of these as well as other factors that could have contributed to

the differences observed. Certainly, Cuddalore had much less social and residential disruption. What lead 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. While 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, et al. (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 eight or more symptoms on the seventeen-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 them in the intervention session. But we have no reliable measure of practice so we don't 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 that 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. Although self-reported and without a control comparison, these reports suggest a very positive and durable treatment effect was observed. The fact that there was a differential rate of improvement between the two districts suggests that gains were not just a function of 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 shows a substantial pattern of improvement on core PTSD symptoms, further verifying positive treatment effects. Over all participants,

80% said “yes” to the experience of one or more core PTSD symptoms of arousal or intrusion and 50% to avoidance reactions. However, at the 8-month follow-up, over 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., Bronish, et al., 2006 for tsunamis; Norris, 2001; Granger, Levin, Allyn-Byrd, Doctor, R.M. and Lee, 1998, for hurricanes; van de Kolk, 1996, for volcanoes; Konuk, Knipe, Eke, Yuksek, Yurtsever & Ostep, 2006 and Kisac, 2006, for earthquakes). Reyes and Elhai (2004) assert that time is precious in post-disaster settings and immediate intervention is necessary. Despite their assertion, this study found that improvement of symptoms related to the tsunami could be achieved when intervention occurred as much as six months after the tsunami. Subsequent intervention projects were conducted one and two years afterward 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 suggests 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 (2006) conducted an intervention with New Orleans aid workers from Catholic Charities who reported PTSD symptoms soon after Hurricane Katrina. While the results were basically descriptive, participants improved with a somatically-based treatment but showed signs of regression at the 4 month follow up. The author speculates that the approach of another hurricane season may have triggered increases in symptomatology. However, Leitch (2007), in a more recent small exploratory study, found continued long-term gains in tsunami survivors with intervention after only one month.

The results of this study suggest that Somatic Experiencing Therapy is an effective approach for treating trauma-related reactions and PTSD. 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 one hour and fifteen minutes which indicates the effectiveness of this particular protocol on disregulation from trauma.

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Post Tsunami Presenting Symptoms 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

Table 1. Participant ratings on improvement on Post Tsunami Symptoms on modified SUDs at 4 weeks and 8 month assessments

Degree of Overall Stress Improvement	Per Cent Participants
25-49% Improvement	5.5%
50-69	19.2
70-89	44.0
90-100	31.2

Table 2. Participant ratings of improvement in overall (global) life-stress levels since the treatment (8 months prior)