

Beiträge zur Pädagogischen und Rehabilitationspsychologie

Herausgegeben von Evelin Witruk

Band 4

Evelin Witruk / Arndt Wilcke (eds.)

Historical and Cross-Cultural Aspects of Psychology



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Long-Term Psychosocial Consequences and Mediator Intervention for Children and Adolescents Affected by the Tsunami 2004 in Sri Lanka

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Abstract

This study investigated the long-term psychosocial effects after the three years of tsunami exposure, i.e. Post-Traumatic Stress Disorder (PTSD), anxiety, and educational difficulties. To facilitate psychological well-being, two types of interventions were implemented. 1. A Mediator Intervention for Children (MIC) with autoregulative treatment approach and 2. A Mediator Training Program for Counselors (MTPC) conducted by professionals in psychology, for those who became mediators (counselors) treating affected children and adolescents.

A quasi-experimental, two-group design with a pre-test and post-test was conducted to determine the success of the intervention in children. Data were collected from 80 children and adolescents being affected by the tsunami, with $n = 40$ in the experimental group (EG) and $n = 40$ in the control group (CG) using standardized tests, i.e. the Childhood Post-traumatic Stress Reaction Index (CPTS-RI), the Revised Children's Manifest Anxiety Scale (RCMAS), and a self-developed questionnaire for educational difficulties. For the MTPC, a one-group pre-test and post-test design was applied. Data were collected using a self-developed knowledge based screening test from 20 counselors. All participants came from the Matara District in Southern Sri Lanka.

Pre-test -results (prior to intervention) proved that children encountered mild to severe PTSD symptoms. The two-way ANOVAs with three measurement times stated that there was an overall reduction of PTSD, anxiety, and educational difficulties of the EG compared to the CG. The experimental group's children's mood changed (sad-happy); there were improved fearlessness, activation and relaxation. Through the meditation training program, counselors' knowledge significantly increased in comparison to the pre-test.

Key words: Psychosocial Consequences, Autoregulation Treatment Methods, Mediator Training Program, Intervention

1 Background

Epidemiological studies show that natural disasters can have widespread and devastating impact on health and national and community stability even if only a few individuals were primarily affected. Thousands of humans lost their lives as a result of natural disasters. The long history of natural disasters has been continuing since the world began and even today it is continuing in the world. It

can be divided into various types such as earthquakes, volcanic eruptions, landslides, flood, storm, cyclones, hurricanes, forest and bush fires, droughts, tsunamis etc. The Indian Ocean tsunami on the 26th December 2004 was one of the most severe disasters in the last several decades. According to the United States Survey's National Earthquake Centre, it was the fourth largest earthquake since such measurements began in 1899. The above mentioned disaster was measured as 9.0 magnitudes on the Richter scale and triggered a massive tsunami that moved 4,500 km across the Indian Ocean within a period of about seven hours. Tsunami waves struck 12 countries in South East Asia. Among the affected countries, Indonesia, Sri Lanka, India, and Thailand were the worst hit, given the extent of widespread destruction suffered, the number of lives lost, and the number of individuals displaced. However, at least five million people were affected in South-Asian countries. The collective death toll from these countries exceeded 280,000 people. Some 1,500,000 people were displaced from their homes (USAID, 2005). Moreover, many survivors suffered from minor-to-severe physical injuries. According to the Ministry of Women Empowerment and Social Welfare (2005) the number of deaths recorded in Sri Lanka exceeded 40,000 and the number of missing exceeded 15,000 people including children and adolescents. One million people have been rendered homeless. Consequently, all major population groups of Sinhalese, Tamils, and Muslims were affected in Sri Lanka. Moreover, the numbers of children separated from both parents were 995 and 5000 or more have lost one parent that may be either mother or father (National Child Protection Authority [NCPA], 2005).

2 Problem of the study

Disasters affect human life in short and long term, take heavy tolls on mental health of those affected and significantly increase psychological problems and mental disorders. Disasters also usually include multiple stressors that can have differential effects on survivors (Norris 2005; Stevens & Slone, 2005). There is the further assumption that disasters will develop psychological symptoms of distress which are in fact normal human reactions to severely traumatizing life experiences (Mollica, Donald, Massagli & Silove, 2004). Emotional reactions: fear, depression, withdrawal, anger, and physical complaints or symptoms with no medical basis can occur immediately or weeks, months, and years after the traumatic events (Amanda, 2005; Norris, 2002). Research findings indicate that problems seem to be most pronounced with regard to somatic complaints, stress, anxiety, and social problems (Norris et al., 2002). Similar findings have been reported in studies of adolescents (Goenjian et al., 2001; Lipschitz et al., 1999). In traumatized adolescents, Saigh et al., (2002) found that internalizing behavior problems were secondary to post-traumatic stress disorder (PTSD). Hence,

traumatic experiences may not only induce PTSD, but psychosocial impairments as well.

In accordance with Norris (2005) age often influenced disaster victims' outcomes. Samples show that children generally exhibit more severe distress after disasters than adults do. Further research studies stated that "some adolescent survivors report significantly high rates of depression; some become clinically depressed, have suicidal thoughts and take over-doses in the year after the disaster" (Yule et al., 2000, p.505). Many children do report significant levels of emotional distress and frequent occurrence of sub clinical levels of PTSD (Belter & Shannon, 1993; McFarlane, 1987). According to Norris (2005) in general, injury and life threat were most predictive of long-term adverse consequences, especially PTSD. Recent research evidence also underscores the importance of loss (of family members, of pets and of personal property) as contributing to PTSD symptoms in children (La Greca et al., 1996). Previous studies have shown that the degree of disaster exposure due to property destruction, deaths, and serious injuries predict the prevalence and severity of PTSD and depressive symptoms (Freedly, Shaw, Jarrell & Masters, 1992). However, some children have worries and bad memories that gradually disappear over time with emotional support of caregivers and communities. But other children may experience more long-term problems, stress reactions, and PTSD (Yule et al., 2000). Worries and concern can interfere with a child's ability to pay attention, concentrate and thereby cause difficulties in school. However, children with higher levels of post-traumatic stress reactions displayed more behavioral problems.

Millions of people have been directly affected by the tsunami and the proportion of child survivors is especially troubling since children generally exhibit more severe distress after disasters than adults do (Stevens & Slone, 2005). Although there is limited knowledge of the mental health consequences of tsunamis in particular, researchers show from other large-scale disasters that the impact on the mental health of survivors is often enormous (Stevens & Slone, 2005). Therefore, it is important to investigate the psychological well-being of children and adolescents affected by the tsunami.

Sri Lanka is now moving forward in some aspects of reconstruction, but in mental recovery, the progress is relatively slower than others (Martin, 2005). A sizeable proportion recover in the next few weeks or month following the disaster, but in a significant subgroup the symptoms persist, often for years. It is largely the subgroup of people with persistent PTSD who seek treatment (Clark & Ehlers, 2000). Sri Lanka needs long-term assistance from many sources to rebuild the lives and livelihood of its people. The needs of vulnerable groups like children and adolescents should receive special attention in the rehabilitation process.

The fact that tsunami affected children need counseling and therapeutic methods, is strongly indicated in the literature. Therefore, the present study fo-

cuses on an intervention for tsunami-affected children and on developing the counseling service in the school system (teach the teacher approach) in the southern part of the country. So, it is intended that the current study identifies the psychosocial needs of children and adolescents that could be served by mediator intervention with autoregulation methods by trained counselors. It would be helpful to further avoid negative coping of children. In addition, the findings of this research could support initiatives to sustain a balanced healthy life, facilitate psychological adjustment, enable treatment and prevention, and reductions of the PTSD, anxiety symptoms, and educational difficulties in children and adolescents affected by the tsunami in Sri Lanka. The study could also help to develop the school counseling service and help teacher counselors to improve their knowledge and skills in counseling especially those related to disaster management. They could be used in the future to prevent maladaptation and meet emergency situations for school children.

However, in spite of the large volume of the psychosocial problems, the amount to which a new approach such as "mediator intervention" for psychological well-being for children is put to practice in Sri Lanka is negligible. This study was therefore intended to contribute to narrow this wider gap by investigating the long-term psychosocial consequences and the facilitation of psychological well-being for tsunami affected children and adolescents. The present study implemented two types of interventions. (1) A mediator training program for counselors (MTPC) conducted by professionals in psychology for those who became mediators (counselors) for treatment towards affected children and adolescents and (2) A mediator intervention for children (MIC) with holistic treatment approach and the MIC involved above mention autoregulation methods for affected children and adolescents.

3 Research questions and main hypothesis

An attempt was made to answer the following main research questions and hypothesis:

1. How effective will be the proposed mediator counselors' training program for school counselors?
2. Is the tsunami loss aspects (family, friends, and property destruction) associated with PTSD among affected children and adolescents?
3. To what degree do tsunami-affected children suffer from PTSD, anxiety, difficulties with education as long-term effects and which symptoms cluster and difficulties decrease after the intervention in the experimental group (EG) as compared to the control group (CG)?

4. How far do the affected children (experimental group) experience changes in their mood, increase fearlessness, activation, and relaxation throughout the intervention program?

There are long-term psychosocial consequences among the tsunami-affected children and adolescents i.e., PTSD, anxiety, and educational difficulties. The auto regulative treatment methods are effective for decreasing those problems, for changing mood, and for increasing fearlessness, activation, and relaxation in the EG in contrast to the CG. The mediator training program helps to improve the knowledge of counselors as compared to their prior knowledge (pre-post).

4 Methods

4.1 Methods of data collection

To study the effect of the intervention, a quasi experimental two groups pre-test and post-test with control group study design was conducted. The sample which consisted of 80 children and adolescents affected by the tsunami were divided into two groups, i.e. experimental group (EG, n=40) and control group (CG, n=40). The Childhood Post-traumatic Stress Reaction Index (CPTS-RI), Revised Manifest Children Anxiety Scale (RMCAS), the self developed questionnaire for educational difficulties along with additional items designed to tap on important tsunami related experiences, socio demographic data, and psychological well-being (Kurz-Skala-Stimmung/Aktivierung [mood, fearlessness, activation, and relaxation] [KUSTA]) scale were employed for the affected children's intervention (MIC). A one-group pre-test and post-test design was conducted, to evaluate the effect of the mediator (counselors) trainings. Data was collected by self developed knowledge based screening test from 20 counselors. All participants were from Matara District in the Southern part of Sri Lanka.

The Childhood Post-traumatic Stress Reaction Index (CPTS-RI) scale is considered the most widely used instrument for diagnosing PTSD in children (McNally, 1998). The CPTS-RI is a Likert-type scale ranging from none of the time (0) through a little of the time (1), some of the time (2), much of the time (3), and to most of the time (4). It is a 20 item self-report measure of PTSD symptoms. It establishes the existence of 17 PTSD symptoms and 3 associated symptoms in children. One particular advantage of this measure is that items were designed to be made situation specific. The CPTS-RI scale was therefore selected to use in present research, as this scale would be appropriate to identify those children and adolescents who have experienced tsunami traumas (Criterion A stress factor), for example, "Is the tsunami something that would upset or bother, most children of your age?", "Do you get scared or upset when you think about the tsunami?", "Do thoughts about the tsunami come back to you even when you do not want them to?". In addition, to identifying symptoms of PTSD,

the CPTS- RI can be further broken down into three symptom clusters: re-experiencing, numbing or avoidance, and hyperarousal. Criterion B, re-experiencing the event (questions 2, 3, 4, 5, 17, and 19 e.g., "Do you get scared, afraid, or upset when you think about the tsunami?", "Do you have good or bad dreams about the tsunami or other bad dreams?"); Criterion C numbing or avoidance: (questions 7,8, 9 10,and 16, e.g., "Do you feel as good about things you liked to do before the tsunami like playing with friends, sports, and school activities ?" "Have you felt so scared, upset, or sad that you could not even talk or cry?"), and Criterion D hyperarousal (questions 6, 11, 12,14,15,and 20, e.g., "Do you startle more easily or feel more jumpy or nervous than before the tsunami?", "Do you sleep well")

The CPTS-RI scale's reliability and validity has been proved across the disasters' research studies (Frederick, Pynoos & Nader, 1992; 1996; Vernberg et al., 1996). Correlations with PTSD cases have been good ($\alpha=.91$) (Frederick, 1985), it has been stated that internal consistency is moderate to good, test-retest is excellent, and validity is supported. Extensive research on this scale has supported its suitability for children of varying ages, cultures, and traumatic experiences. For instance, internal consistency has also been acceptable ($\alpha=.83$, Vernberg et al., 1996), the alpha reliability in Dissanayake, (2008) study in Sri Lanka in the tsunami context was also ($\alpha=.80$) and split-half reliability was ($\alpha=.72$). The present study alpha reliability using current sample was found to be ($\alpha=.84$).

The Revised Children's Manifest Anxiety scale (RCMAS): The RCMAS is a 37item self-report inventory used to measure anxiety in children. The RCMAS consists of 28 anxiety items and 9 lies (social desirability) items. Each item is purported to embody a feeling or action that reflects an aspect of anxiety. It is only used as part of a complete clinical evaluation when diagnosing and treating a child's anxiety (Gerad & Reynold, 1999).

The RCMAS scale was developed by Reynolds and Richmond (1978) to assess "the degree and quality of anxiety experienced by children and adolescents" (Gerald & Reynolds, 1999, p. 323). It is based on the Children's Manifest Anxiety Scale (CMAS), which was devised by Casteneda McCandless and Palermo (1956). The revised version of the CMAS deletes adds and reorders items from the CMAS to meet psychometric standards. Reynolds and Richmond (1978) also renamed the instrument, "What I Think and Feel", although subsequent papers primarily refer to it as the RCMAS. This is used for aged group of 6 to 19 years. The wording of items had to be adjusted to accommodate the younger children and poor readers. The present study was used for children and adolescents aged 9-15 years. The instrument was administrated to small groups of children by school counselors. Further, the instrument used was a 5-point Likert-type scale (1=never, 2=sometimes, 3=often, 4=most of the time, 5=always).

The RMCAS introduced five factors, three for anxiety and two for Lie Scale (social desirability), named based on the physiological factor signs of anxiety (items number 1, 5, 9, 13, 17, 19, 21, 25, 29, and 33 e.g., "Often I have trouble getting my breath", "Often I feel sick in my stomach and my hands feel sweaty"; the worry/oversensitive factor (items number 2, 6, 7, 10, 14, 18, 22, 26, 30, 34, and 37, e.g., "I get nervous when things do not go the right way for me", "I worry a lot of the time"; the concentration anxiety factor (item numbers 3, 11, 15, 23, 27, 31, and 35, e.g., "I feel alone even when there are people with me, other children are happier than me"). The RMCAS standardizes several disaster related studies and the 37 items selected for the RMCAS, a Kuber-Richardson (KR) 20 reliability estimate of .85 is yielded confirming internal consistency of the RMCAS. The alpha reliability using the current sample was found to be $\alpha = .80$. The present study focused only on symptoms (29 items); lie-themed items were not analyzed because the present study was an intervention.

Educational Difficulties: This section was developed to find out children's educational difficulties after being affected by the tsunami. Educational difficulties questionnaire includes 14 items with 3 subscales with regard to; lack of school motivation (item numbers 6,8,12,13, and 14, e.g., "I do not like to go to school"); concentration and memory difficulties (item numbers 1,3,5,17, and 10 e.g., "I have poor concentration during my learning activities: class work, listening to the lesson, homework, and reading books"); and self judgment of academic performance (2,4,9 and 11, e.g., "I feel that I have a poor academic performance after the tsunami").

All above mentioned items were created considering the literature review of natural disasters. This instrument was also constructed on a 5 point Likert-type scale (1=never, 2=sometimes, 3=often, 4=most of the time, 5=always). The self developed questionnaire was assessed by three persons (university academics). They considered whether it was culturally- and age-appropriate for tsunami affected children in Sri Lanka. The reliability of the instrument presents that the educational difficulties scale was well fitted and the internal consistency (reliability) of the instrument reached $\alpha = .87$ and item correlation values also ($\geq .3$ (.341- .697)).

KUSTA (Kurz-Skala-Stimmung/Aktivierung) (mood, fearlessness, activation and relaxation): KUSTA scale was developed by Binz and Wendt (1986). This questionnaire's aim is to evaluate the feeling of relaxation and well-being as an effect of the training program. This was implemented in the present study, only for the experimental group, in each session pre and post over five week's duration of the intervention. It focused on children's emotion, how do you feel; sad-happy, fear-fearlessness, tired-activation and I feel easily relaxed or I do not feel relaxed easily etc. This measurement helped to perceive

the changes in emotion due to the intervention. Children were also asked to grade the extent to which they mobilized each feeling and to indicate relaxation on a 7-point scale with 1 to 7, (1= extremely sad, 7= extremely happy) (Stueck, 2007).

The measurement was conducted three times by the mediator counselors using the same above mentioned questionnaires. The first measurement served as the pre-test and the second was post-test 1 and the third formed post-test 2. These were conducted on each test day for both groups (experimental and control) by substitute counselors. Three years after the tsunami and prior to participation in the counseling intervention, counselors have obtained consent from the children and their parents and care-givers in regard with filling out the questionnaires. The children intervention was conducted as the following figure 1.

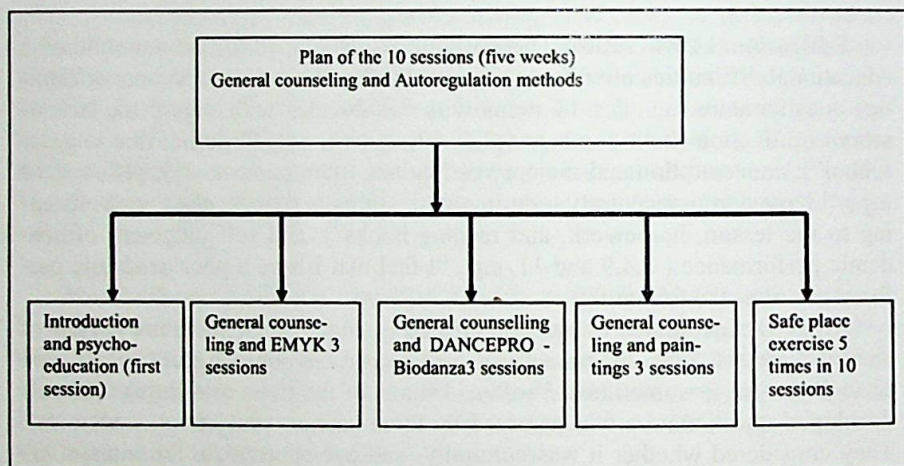


Figure 1: Intervention Plan

4.2 Data analysis methods

In this study mainly quantitative data analysis techniques were used. The statistical package SPSS 15.0 and 17.0 for Windows were used. The data gathered from the two groups (EG and CG) of children and adolescents were analyzed using mean, standard deviations, correlation (Spearman, Canonical), multiple regression and bar charts. The two-way ANOVAs were computed three measurement times for the MIC, in addition to that effect sizes and power test were analyzed to discern three measurements time and groups differences. Intervention group's psychological well-being (change of the mood, increase activation, fearlessness, and relaxation) measured by paired t-test and effect sizes and

power test. For the MTPC, paired sample t-test was performed to determine within group changes in pre- and posttest performances. Statistical significance was defined at the standard 0.05 level.

5 Results and discussion

5.1 Interventions 1 and 2

Counselor's knowledge was improved between pre and post measures. For instance, counseling theories, pre ($M= 9.45$, $SD= 5.85$) and post ($M= 15.75$, $SD= 3.37$), and ($t(19) = -5.19$, $p<.001$). DANCEPRO-Biodanza, pre ($M= 0.00$, $SD=0.00$), post ($M=6.10$, $SD=1.65$), and ($t(19) = -16.52$, $p<.001$), safe place exercise, and painting knowledge are improved substantially (see Figure 2).

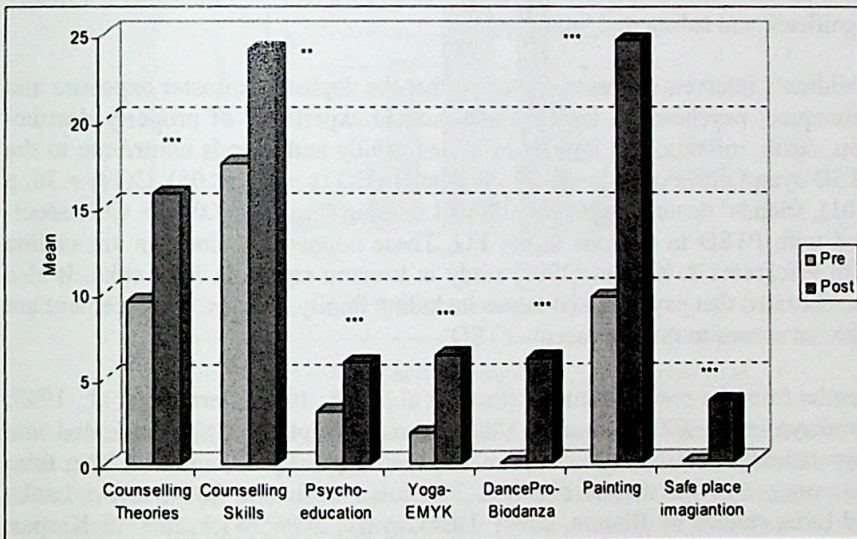


Figure 2: Counselors' knowledge in counseling theories, counseling skills, psycho-education, Yoga-EMYK, DANCEPRO-Biodanza, painting therapy, and imagination if a safe place exercises pre-post differences (Note: $p<.001$ *** $p<.01$ ** $p<.05$ *)

The result of this study shows a significant difference in counselors' knowledge improvements between pre and post measures. Counseling theories: client-centered, rational emotive, psychoanalytic, behavioral, and existential theories' knowledge has been considerably changed during the training program, it is proved statistically ($p<.001$), and hypothesis is also supported. Significant differences were found in Yoga, EMYK and painting therapy: yoga helped to improve individual mind body, spiritual well-being, and EMYK's asana (body ex-

ercises) groups (e.g., single asana; yoga series; children as yoga teacher and types of breathing styles i.e., Ujjayi,-paranayama, Nadi-shodhana, Rhythmic breathing). The EMYK knowledge was not developed in the pre-test in contrast to the post-test results. In relation to this, it is increased by the training program that proved in statistically ($p < .001$).

Further analysis of the associations between pre and post in painting therapy showed the highest significant differences: paintings expressed of the person's feelings and thoughts, enhancing the physical, mental and emotional well-being of children, paintings supported to heal anxiety, depression, family relationships, trauma and loss, substance and addiction, social and emotional difficulties, developed self-esteem and self-confidence, improvements in concentration ability etc. These factors all together proved that after the training program counselors exposed an increase of their knowledge. In particular, painting methods' knowledge did not exist in the pre measure; however, post-test emphasized a highly significant and substantial improvement

Children's intervention results revealed that the degree of disaster exposure and subsequent psychosocial losses which include experience of property destruction, death, missing, and injuries of closed family and friends contribute to the PTSD symptoms. For instance, family death in EG ($r = .34$, $p < .05$), CG ($r = .36$, $p < .01$), friends' death ($r = .36$, $p < .01$) and missing ($r = .40$, $p < .01$) in CG associated with PTSD in contrast to the EG. These noteworthy findings are in line with Wickrama & Kaspar, (2007) study in tsunami region in Sri Lanka. It also corroborated that psychosocial losses including family, friends, displacement are relevant causes to the adolescents PTSD.

Results from the previous studies (Earls et al., 1988; 1995; Garrison et al., 1993; Karakaya et al., 2004; Roussos, 2005; Russoniello et al., 2002) indicated that post-traumatic stress is one of the main psychological problems as a long term consequence of the natural disasters. Particularly, tsunami 2004, in Sri Lanka and India studies by Bhusan, 2007; Dissanayake, 2006; Wickrama & Kaspar, 2007) found that affected children and adolescents encountered considerable amount of the PTSD. The results of the present study confirmed these findings.

All the children in this sample were exposed to the tsunami, and almost both groups have certain PTSD levels: both groups had mild to severe PTSD symptoms 3 years after the tsunami. It is important to note that the majority of the children reported moderate level of PTSD symptoms in both groups: 40 % had in EG and 45% had in CG. Severe category in EG had higher levels in contrast to the CG. Also, only a small percentage of the sample fell into the very severe category (see figure 2). These findings are in line with the previous research finding which observed that significant proportion of children report PTSD

symptoms after the catastrophic disasters, for example, La Greca et al., (1996) found in Hurricane Andrew, 86% of the sample children reported mild symptoms of PTSD and 55% reported moderate to severe symptoms; Russoniello et al., (2002) found that 95% of children reported at least mild, 71% moderate to very severe PTSD symptoms. Further Dissanayake (2006) found female and male separately: mild both sexes: 20% male, 10% female and moderate: 41% male and 54% female. Even though there is a wide and consistent body of research indicating that females exhibit higher levels of PTSD than males following natural disasters (Green et al., 1991; Lonigan, Anthony, Shannon, 1998; Vernberg et al., 1996).

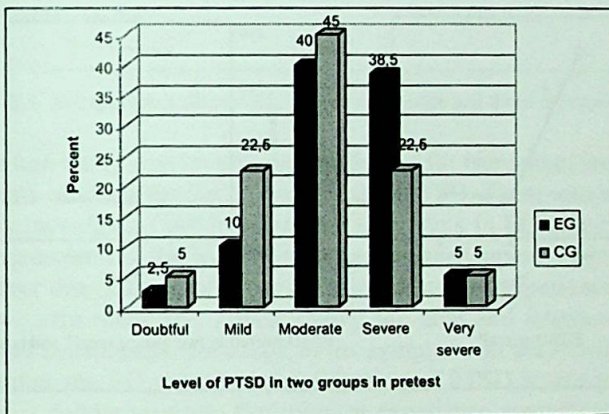


Figure 3: Level of PTSD in two groups in pre measurement time

The present study, children and adolescents were not found gender relationship with PTSD. The EG male ($M=3.18$, $SD=.56$) ($n=23$) and female ($M=3.38$, $SD=.68$) ($n=17$), $t(38) = -1.00$, $p = .322$, in CG male ($M=2.61$, $SD=.69$) ($n=21$) and female ($M=2.81$, $SD=.67$) ($n=19$), $t(38) = -9.28$, $p = .359$ respectively. However, age differences stated the relationship with PTSD in both groups. It showed that in the pre-test but it was not significant ($B = -.003$, $t = -.163$, $p = .871$). Although, the post-test 1 and post-test 2 showed a significant relationship with age differences with PTSD in both groups, posttest1 ($B = .040$, $t = 3.08$, $p = .003$), and post-test 2 ($B = .055$, $t = 3.14$, $p = .002$) respectively.

The present study acknowledged that prior intervention for children (as found in the pretest results) revealed a significant decrease of PTSD and anxiety symptoms. The aims of the MIC intervention, research questions and hypothesis were overall achieved and supported across the mediators (counselors) who carried out this study.

The intervention findings gave significant support that autoregulation treatment methods reduced the overall PTSD symptoms in EG in contrast to the CG. A two-way ANOVAs repeated measures of general, short and long term effects' results vividly showed that symptoms of PTSD were decreased. For instance, general effect (pre, post 1 and post 2) interaction between group and time reached the high significance ($F(1.94, 128.07) = 12.98, p < .001, d' = .71, 1-\beta = .99$) and reduction of PTSD was stabilized between post 1 and post 2 measures in EG in contrast to the CG (see Figure 4).

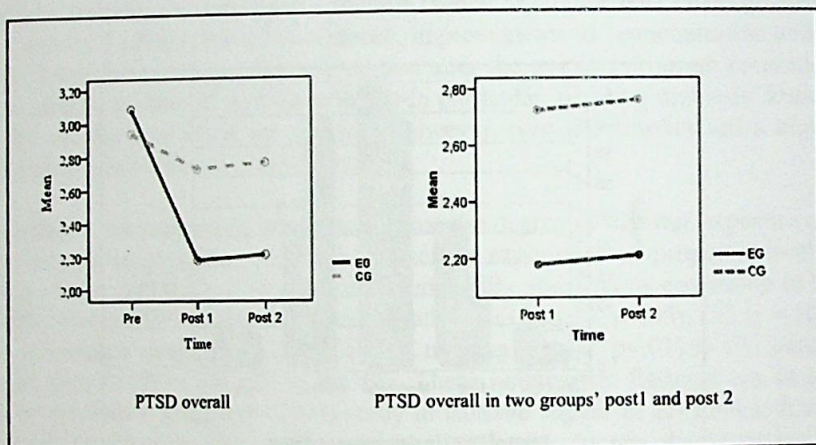


Figure 4: PTSD overall in two groups and three measurement times and its post 1 and post 2.

In accordance with figure 4 re-experience and avoidance symptoms of PTSD were decreased in the EG in contrast to the CG and it proved significantly an interaction between group and time ($g \times t$), ($F(1.90, 127.21) = 13.80, p < .001, d' = .73, 1-\beta = 1.00$) and ($F(1.88, 127.97) = 8.41, p < .001, d' = .55, 1-\beta = .95$) respectively (see figure 4). Further, The Greenhouse 3 measurement times' general results stated that the hyper arousal symptoms were decreased significantly in the EG in contrast to the CG ($F(1.90, 148.55) = p = .013, d' = .35, 1-\beta = .72$).

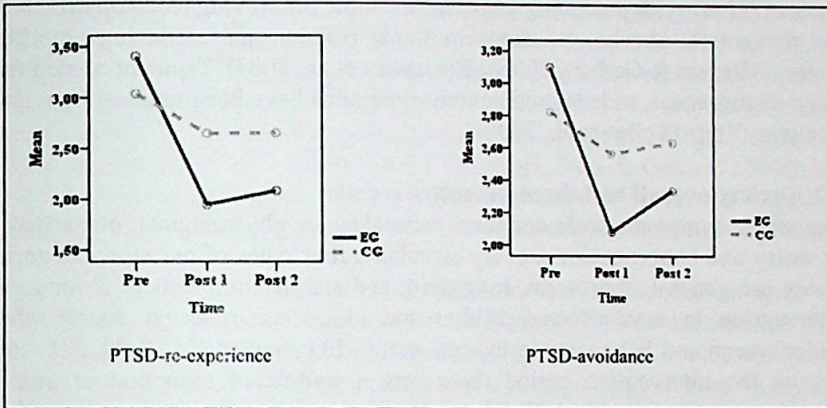


Figure 5: PTSD- re-experience and avoidance in two groups and three measurement times

This intervention study was vividly more effective for tsunami-affected children and adolescents of all categories of symptoms of PTSD. There was a decrease in re-experience, avoidance, and hyperarousal symptoms in EG significantly. But not to the degree seen in the reduction of these three symptom clusters with the CG. For further discernment of each symptom cluster: re-experience in general, short and longterm measures' effects during the time and interaction between groups showed considerable reduction of the symptoms in the EG in contrast to the CG. Further the EG stabilized the reduction of PTSD levels in contrast to the CG (post 1-follow-up test). However, re-experience symptoms: images or memories of tsunami, uncontrollable thoughts and bad dreams, repetitive play involving the tsunami's affects of the children can be proved by the significant reduction in the EG in contrast to the CG.

This study implemented mixed methods of intervention; therefore in discussing its implications, it cannot be compared and contrasted at the same level with other previous intervention studies. Discussing its implications, thus, can be made by taking examples from previous research which used every method separately to be compared and contrasted with the results of the specific method in this study. For instance, painting therapy, Yoga, and EMYK were included. Other research studies also proved the importance of applying those methods on disaster affected children. For examples Chilcote, (2005) proved that painting therapy helped to express thoughts and feelings of tsunami trauma of the affected children. Further it has effects for healing process of tsunami trauma. Moreover, art therapy with painting studies showed that reducing avoidance and hyperarousal symptoms, externalization of traumatic memories, reconsolidation of memories, reactivation of positive emotions, build up self-esteem, and help re-establish adaptive social functioning (Collie et al., 2006; Pifalo, 2002; Rankin & Taucher, 2003). Moreover, other four studies proved that reducing the symp-

toms of PTSD with practicing yoga, for example, improving sleep quality, helping prevent flashbacks, reducing emotional reaction and reducing emotional distress (Brown & Gerberg 2005b; Rusiewicz et al., 2007). Tsunami related fear, sleep disturbances, sadness and anxiety symptoms have been reduced by relaxation with Yoga (Telles et al., 2005).

5.2 Anxiety overall and three subscales results

The whole symptoms scale and three subscales i.e., physiological, oversensitive or worry and concentration anxiety calculated four types of measure categories. Those are general, short-term, long-term, and stabilization effects. Prior to the intervention, tsunami affected children and adolescents reported anxiety whole scales' mean and SD scores in the pre-test, in EG showed ($M = 2.78$, $SD = .68$). During the intervention period there was a significant reduction of anxiety symptoms in the EG ($M = 1.93$, $SD = .62$) and the follow-up test also showed the stabilization of anxiety reduction in the EG. ($M = 2.02$, $SD = .72$). But in control group's mean values did not present a significant changes of the symptoms of the pretest ($M = 2.48$, $SD = .80$), post1 ($M = 2.38$, $SD = .86$), and post 2 ($M = 2.40$, $SD = 1.07$) respectively. Moreover, the pre-test results of both groups showed independent sample t-test, non significant difference in pre scores ($t(64) = 1.67$, $p = .100$).

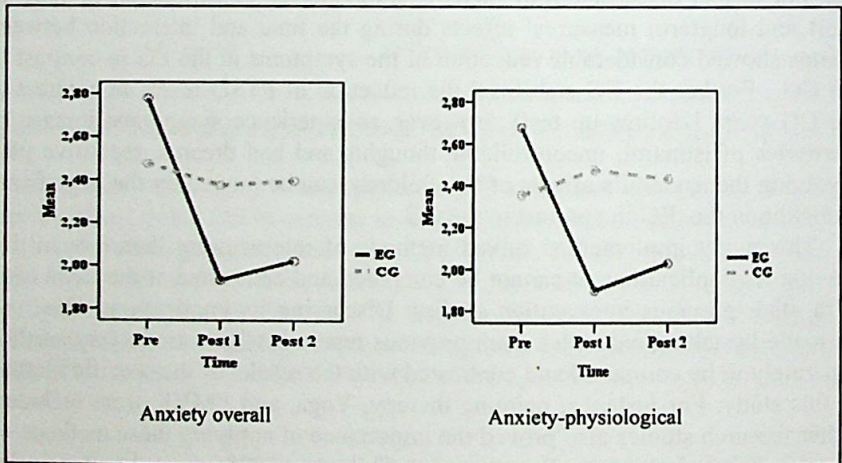


Figure 6: Anxiety overall and physiological in two groups and three measurement times

As mentioned in Figure 5, The two-way ANOVAs further accounted that the general results of intervention, anxiety overall symptoms' were decreased after the treatment of affected children and physiological, concentration, and worry or over-sensitive subscales also proved that symptoms were decreased significantly in the EG in contrast to the CG.

As consequences of disasters varied studies proved that affected children and adolescents have anxiety, Conde, (2003) Wild fire study indicated most commonly reported symptom was worry or oversensitive followed by physiological and concentration symptoms. This study was also similar to worry or oversensitive, followed by concentration and physiological symptoms in EG. Moreover, studies by Bruke et al., (1986) flood ; Dewaraja, Sato & Ogawa, (2006) tsunami in Sri Lanka; Lonigan et al., (1991) ; Swenson et al, (1996) hurricane, proved that affected children and adolescents encountered anxiety symptoms.

In the present study tsunami affected children's anxiety symptoms were decreased seemingly and this can be implied with other previous intervention studies. For example, Telles et al., (2005) found that tsunami survivors reported greater decrease of fear, anxiety, sadness and also physiological symptoms (e.g., breath rate, skin resistance) after the one week yoga practice intervention. Brown and Gerbarg (2005b) found effectiveness of yoga managing with PTSD and related anxiety symptoms were reduced. Miller, Fletcher & Kabat-Zinn, 1995; Sahasi, Mohan & Kacker, 1989; Venkatech et al., 1994) found that practice of yoga for anxiety in long-term duration and its effect for the decreased symptoms. Moreover, yoga practice facilitated to decreasing examination anxiety (Broota & Sanghvi, 1994; Malathi & Damodaran, 1999). Stueck, (1994-1998) found the EMYK yielded reduction of examination nervousness in school children. Further this study focused on short and long term suitably in exam nervousness. The results encountered those children's physical complaints and helplessness were decreased. Psycho-physical behavior and emotional balance were increased. Norton and Johnson (1983) reported that different relaxation methods might be effective for different types of anxiety. The present study also is in line with EMYK and implemented three types of breathing methods with different body exercises (asana). Accordingly out of all those intervention studies, yoga was eventually the most effective for reducing anxiety in different extents.

Moreover, Webster (2002) intervention study proved that relaxation techniques supported to decrease children's anxiety. Also, the deep breathing and relaxation techniques helped to change the negative thoughts of children. Children who received the intervention emerged with lower rates of self-reported anxiety, as measures at post intervention, compared with those who were in the waitlist as control group. Art therapy was also found to be helpful in decreasing the anxiety; psychological phase's recovery (e.g., Pifalo, 2002; Prager, 1993; Russell, 1995). On the one hand, DANCEPRO-Biodnaza help to reduce anxiety and psychosomatic complaints (Stueck , 2007; Steuck & Villages, 2008), on the other hand, Biodnaza for adults with anxiety as a case study proved that anxiety and

meaninglessness of life were decreased through long-term practice, in addition to that it increased the self-esteem, self-efficacy, internality, and ability to self-regulate (Stueck & Villages, 2008). In relation to the previous studies and Hager and Hassel (2005) model, this study could be concluded as a successful intervention in anxiety variable.

5.3 Educational difficulties overall and three subscales

Educational difficulties and its subscales which are concentration and memory difficulties, self judgement academic performances and lack of school motivation, the two way ANOVA results showed the overall measurement times (pre-post 1 post 2) in educational difficulties have been decreased in the EG with comparison to the CG. The concentration and memory difficulties scale, general and short-term effects showed decrease of the difficulties, which were poor concentration during the learning activities; class work, listening to the lesson; homework; hard to retain what child learned in the classroom after the tsunami and tsunami thoughts coming to mind when reading the books at home in the EG in contrast to the CG. But all subscales proved that stabilization effect of the treatment is not significant which means that tsunami affected children and adolescents need further treatment and support in the long term. Many researchers have pointed out that disaster affected children encountered failure of the academic performance. For instance, the Hurricane Katrina, displaced students many of whom were already performing well below grade-level in reading and mathematics (Cassery, 2006; Fothergrill & Peek, 2006). With regard to the academic functioning: class room activities, concentration, memory difficulties, worries with concern can interfere with a child's ability to pay attention with school works (Norris 2002; Shen & Sink, 2002).

Other researchers, La Greca et al., 2002; Norries et al., 2005; Russoniello et al., 2002) found that disaster affected children presented anxiety, PTSD, psychosomatic disorders with difficulties with school activities. According to the previous studies mentioned above, the present study also is in line with educational difficulties such as concentration and memory difficulties, negative academic performance and lack of school motivation respectively. Notably, there was paucity of other intervention studies regarding educational difficulties; therefore, this study could not comply with other previous studies. However, present treatment methods supported the affected children to reduce some of the difficulties.

Psychological process variables: KUSTA: Psychological process variables such as mood, fear Vs fearlessness, tiredness Vs activation, and not relax Vs easily relax were found to change after intervention among children and adolescent in the EG, these scales were measured at ten sessions during the interven-

tion period according to Binz & Wendt, (1986). The KUSTA results also represented quantitative each session measured by pre and post comparison. Paired sample t-test was calculated including average mean scores and p value. An effect size and power were computed to further significant measures of the pre-post changes. Furthermore, researcher operated under the assumption that auto-regulation methods training sessions for tsunami -affected children and adolescents would change the mood, increase fearlessness, activation, and relaxation.

Mood scale pre –post (mood – sad - happy or joy) : In accordance with Figure 6, (left side) mood results presented that seven sessions out of the ten differences were highly significant ($p < .001$), in the 7th session was also significant $p < .01$, and effect size and power reached necessary criteria ($d^2 = .50$, $1 - \beta = .60$) between the pre and post test measurements. And also session four reached the tendency ($p < .1$), only one session could not reach changes and as it is the session ten because of that pre values are gradually increased. Thus, the hypothesis which was that experimental group children changed moods (sad to happy) during the intervention was accepted. These findings line with previous studies that were done separately with one treatment method (e.g., Yoga, EMYK, and Biodanza). Yoga study improved mood, and reduced depressive moods (Netz & Lidor, 2003); EMYK study proved that emotional balances were increased, feeling of inferiority, extrovert activity, impulsiveness and shyness reduced in contrast to the CG (Stueck, 1998; Stueck et al., 2002). On the other hand, Biodanza has a very high effect concerning the increasing of the mood; it is a “mood booster”, and Biodanza includes a strong emotional expression and different stimuli by dance (effect factors: dance, music, touch, and being with group); and after the dance session there remains a “biochemical cocktail” (Stueck, 2007). Furthermore, there are scientific mechanisms in mood changes of the subject which means that hormone of dopamine increasing and it correlates with positive emotion. Theory of the Biodanza explained that “trance dance and dance enjoyment” cause to increase dopamine. Concerning the result of improvement of mood by Biodanza practices, it stimulates limbic-hypothalamus system and then it releases neurotransmitter, and it supports vegetative reaction; those are reasons for the temper of mood changes. And also throughout the Biodanza practice, eventually, endorphin and dopamine increase, Acetylcholine also begin to change, so, those reasons are causing mood changes (see Stueck, 2007). Besides, MacIntosh, (2003) stated that painting with music contributed awaking emotions.

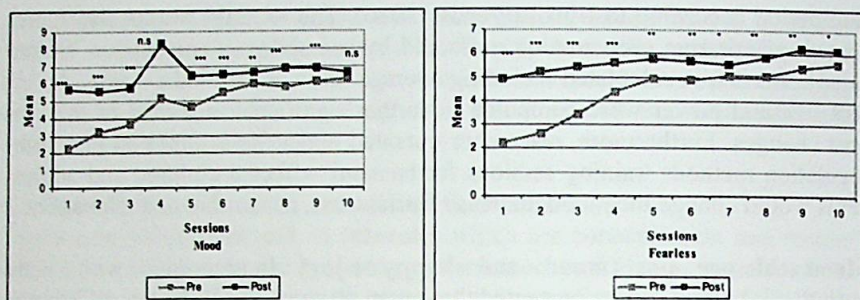


Figure 7: Mood and fearlessness pre-post in ten sessions

Fearlessness scale pre-post: As presented in the right side of the Figure 7 “Fear to Fearlessness” results stated that in four sessions (one to four), the differences were highly significant ($p < .001$), session 5th, 6th, 8th and 9th were significant ($p < .01$) and the rest of the two sessions also were significant ($p < .05$), the effect sizes and power were substantially increased. To sum up all ten sessions, 1-10 sessions fearlessness is increasing from the pre test, ($M = 2.24 - M = 5.60$) to the post test ($M = 4.88 - M = 6.12$). Mediator training sessions were introduced for the affected children, to improve the fearlessness. That means hypothesis was supported. Therefore, this study concludes autoregulative methods contributory change and enhances balance of emotions, particularly, imagination of a safe place exercise contributed to the decrease of the tsunami-related fear because of forming new cognition and it supports to control the emotions and regulate the behavior (Shapiro, 1995; Reddemann, 2001). Breath and painting motion enabled to release emotions and feelings of trauma children of (Schottenloher, 2003; Witruk, 2008); Music with painting is ideal for traumatic memories reduction (MacIntosh, 2003) and also caused negative emotion reduction (Prager, 1993). Accordingly, it can be agreed with previous studies that the present study has also fulfilled the research aims and hypotheses. The tiredness to activation variable also proved that seven sessions significantly changed compared to the pre-test and pos-test. Sum up of these results proved that autoregulation treatment methods supported the tsunami affected children to keep their feelings active, For example mechanism behind Biodanza has strong vitality, Toro (1995), said Biodanza has the possibility support human potential vitality.

As shown in the Figure 8, during the six sessions’ relaxation (first to fifth sessions), the differences were highly significant. In the seventh, eighth and ninth session, significant changes were also reached. But, in session ten the difference between pre and post measure was not significant. Because of that pre values increased gradually. However, effect sizes and power were substantially increased in other sessions and hypothesis was confirmed. These findings are in

line with previous studies which were done with each treatment method separately (e.g., Yoga, EMYK, and Biodanza). Yoga study showed that it improved mood, reduced depressive moods (Netz & lidor, 2003); EMYK study proved that emotional balances were increased, feeling of inferiority, extrovert activity, impulsiveness, shyness were reduced in contrast to the CG. Further yoga studies proved that it enhanced relaxation ability (Meixner, 1980; Smith, 1986; Stueck, 1998; 2002; 2007).

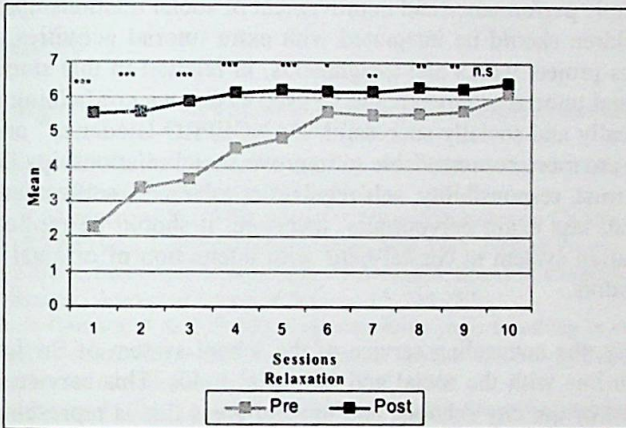


Figure 8: Relaxation pre-test and post-test ($p < .001^{**}$ $p < .01^{**}$ $p < .05^{*}$ ns= not significant)

6 Conclusions and recommendations

Tsunami-affected children and adolescents showed considerable PTSD, anxiety, educational and social relationship difficulties; those were decreased significantly in the EG in contrast to the CG during the intervention. As a result of the autoregulative treatment methods which this study implemented EMYK, DANCEPRO-Biodanza, painting therapy and imagination of a safe place exercise and general counseling contributed to the support for tsunami-affected children. Moreover, counselors' knowledge has also improved during the mediator training program. But in this study some hypotheses were not supported.

Further therapeutic intervention, parenting counseling and psycho education program: In order to deal adequately with psychosocial problems, treatment methods have to be continued further by the counselors. It would be crucial to establish autoregulative treatment methods for all school children in tsunami affected along the coastal belt, especially in the Northeast part of Sri Lanka where the people are most severely affected by the tsunami and war.

Children should be instructed to practice EMYK and to perform safe place exercise as homework guidance by school counselor. Counselors should ask for active support from parents and care-givers and require that they should be realistic given the psychological challenge of their children. For this purpose, parenting counseling should be offered.

Accordingly, the child may benefit from these endeavors to develop academic performance, prevention of social relationships difficulties, day to day sorrows and anxiety, to form of a new cognition and regulate the behavior. Enhance academic performance and improvement of social relationships: Tsunami-affected children should be integrated with extra tutorial activities, and group work such as project works and assignments, in relation to this student-student counseling and tutorial program could be used as one way of helping children to be academically and socially successful. DANCEPRO-Biodanza® and EMYK® for children are more commendable to improve social relationships, learn social interaction, trust, responsibility, self-regulation, tolerance, self-esteem, improve concentration, less exam nervousness; therefore, it should be replicated to the whole education system in coastal-belts with integration of original developers and investigators.

Unfortunately, the counseling service of the school system of Sri Lanka is not developed in line with the social and industrial fields. This service is disseminated in most of the city schools, and in rural areas this is represented only by the school teachers who have no knowledge in counseling. Perhaps the most important step in developing counseling service is to establish a school psychologist position. Accordingly, findings of the present study appear to have further enormous importance for therapeutic intervention and for developing mediator training programs for school counselors. It is paramount to conduct intervention and training programs for school counselors' in the long-term and in large scale. The present study is only focused on children of one ethnic group, the Sinhalese; it is not to be representative of other ethnic groups such as Muslims and Tamils. Thus, it limits itself for the purposes of comparison and the generalization of findings as Sri Lanka is a multicultural and multilingual society, as well as across gender differences in certain psychosocial problems and training effects. Therefore it would be far better to evaluate them separately.

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