

Emergency Responders' Trauma Symptoms Following the West Coast Post-Trauma Retreat Recovery Program

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Doctor of Forensic-Clinical Psychology

By

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EMERGENCY RESPONDERS' TRAUMA AND RECOVERY

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This dissertation by Ryan Dunnigan, has been approved by the committee members signed below who recommend that it be accepted by the faculty of the California School of Forensic Studies – San Francisco Campus in partial fulfillment of requirements for the degree of

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Abstract

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Emergency responders, personnel such as police officers, fire fighters, or medical technicians, by the sheer nature of their occupations, are at greater risk to be exposed to horrific scenes or traumatic events. Despite all of their training, the combination of the daily demands on these responders, coupled with the frequent and intimate exposure to highly stressful events, can have debilitating effects on these professionals and can result in a multitude of profound physiological, psychological, and/or behavioral problems (Cross & Ashley, 2004). The stress reactions experienced by the first responders can express themselves in many ways and can persist for days, weeks, or even years. In fact, in certain cases, research has determined that if the traumatic stress is not treated quickly and effectively, a level of impairment can last for years and can have devastating effects on their health, careers, and their lives (Mitchell & Bray, 1990; Van der Kolk, 1987).

Extensive psychotherapeutic approaches are frequently called for in order to address the needs of these emergency responders. As a result, a number of residential treatment programs for first responders have been established in the United States over the past two decades. One such treatment facility is the West Coast Post-trauma Retreat (WCPR) in northern California. WCPR's program consists of an intensive six-day

treatment program and utilizes a multi-modal, psycho-social model designed to mitigate the secondary effects that result from work-related trauma and stressors. The facility's ultimate goal is to assist the first responder in reducing their symptoms and to restore the equilibrium in the client's life.

To date, there has been very little research on the efficacy of intensive, multi-modal treatment approaches, similar to those utilized at the WCPR. The focus of this study is to evaluate the WCPR's effectiveness in addressing and reducing the trauma-related symptoms present in its clients. This evaluation of the Retreat's efficacy is performed by comparing the results of a pre- and post-treatment administration of the Symptom Checklist-90-Revised (SCL-90-R), a screening measure of general psychiatric symptomatology, for participating clients.

Key words: first responders, trauma, stress reactions, treatment, SCL-90-Revised

Dedication

I dedicate this dissertation to my incredible wife and children. I never would have been able to complete my thesis or doctoral program without their unwavering support and tremendous patience. The sacrifices that they have made over the past few years are immeasurable and I will forever be indebted to them. We are finally reaching the light at the end of a very long tunnel and will shortly be able to slow down and enjoy the ride together. You are wonderful!

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*When sane people are running away from a scene,
emergency rescuers are running into it.*

– Old Police Adage

Introduction

Traumatic events are those events which tend to lie outside of the range of usual human experience. The powerful and unusual nature of these events is capable of producing severe stress reactions in any human being, regardless of the person's normal abilities to cope, their will, their training, or even their profession. Emergency responders, or “first responders,” include police officers, fire fighters, or medical technicians, who respond to these traumatic events and who are charged with the duty of addressing the often horrific results and requirements of these scenes. The combination of the daily demands of the first responders' occupations, coupled with the frequent and intimate exposure to highly stressful events, can have debilitating effects on these professionals and can result in a multitude of profound physiological, psychological, or behavioral problems for these individuals.

The stress reactions, experienced by the first responders, express themselves in many ways and can persist for days, weeks, or even longer. In fact, in certain cases, if the traumatic stress is not treated immediately and effectively, it has been shown that the first responder could have a level of impairment that lasts for years and can have devastating effects on their health, careers, and their lives.

The profound effects and consequences associated with trauma-related stressors have become a critical concern for the administrators of the various first responder organizations and a blossoming area of study for social scientists. In recent years, efforts to address and minimize the potential effects of traumatic events have resulted in the development and routine employment of brief psychological interventions called “debriefings,” which are performed shortly after the event. These debriefings are conducted with the intent of stemming potentially harmful cognitive and behavioral patterns that might be present or developing in the minds of the responders.

Unfortunately, much of the research that has been conducted on these debriefings suggests that the process does not provide a demonstrated preventative benefit in many cases. And, in others cases, the process has been shown to actually have a negative impact for those who are debriefed. This single, stand-alone intervention, however, regardless of the question of its efficacy, has become extremely popular with employers anxious to discharge their ‘duty of care’ as inexpensively as possible.

The reality is that individuals receiving psychological debriefing are not immune to developing long-term psychological sequelae. And, where post-traumatic sequelae persist, or where the psychological problems relate to a longer-term pattern of maladaptive functioning, the debriefings will not serve as a “silver bullet” or cure-all approach. In these cases, more extensive individual psychotherapeutic approaches are certainly called for, and formal follow up efforts are necessary to identify and treat individuals with severe or persistent symptoms.

A number of residential treatment programs for first responders have been established in the United States over the past decade. These treatment facilities focus on addressing detrimental symptoms that the first responders are experiencing after exposure to a traumatic incident. One such treatment facility is the West Coast Post-trauma Retreat (WCPR) in northern California.

The West Coast Post-trauma Retreat is an intensive six-day treatment program in Marin County, California for first responders who are experiencing harmful or debilitating symptoms after exposure to a critical incident or as a result of cumulative stressors. The WCPR utilizes a multi-modal, psycho-social model designed to mitigate the secondary effects that result from work-related stressors. The facility's ultimate goal is to assist the first responder in reducing their symptoms and to restore the equilibrium in the client's life.

To date, there has been very little research on the efficacy of intensive, multi-modal treatment approaches, like the one utilized at the West Coast Post-trauma Retreat. The focus of this study is to evaluate the West Coast Post-trauma Retreat's effectiveness in addressing and reducing the trauma-related symptoms present in their clients. This evaluation of the Retreat's efficacy would be performed by comparing the results of a pre- and post-treatment administration of the Symptom Checklist-90-Revised (SCL-90-R), a screening measure of general psychiatric symptomatology, for participating clients.

At present, much of the research conducted on emergency responders and the effects of traumatic events and stressors suggests that more complex preventative interventions, following traumatic events, are more effective than mere debriefings or no interventions at all. Accordingly, this author expects to find that in conducting research, the therapeutic program employed at West Coast Post-trauma Retreat would serve to decrease the trauma-related reactions in the attending first responders. This decrease in symptoms would be evidenced by a decrease in subscales and indices on the Symptom Checklist-90-Revised measurement results.

Research Hypotheses

The primary purpose of this research study was to assess whether the West Coast Post-trauma Retreat's six-day therapeutic multimodal approach is effective in reducing trauma and stress-related symptoms in first responders. The Symptom Checklist-90-Revised (SCL-90-R) symptom inventory was to be employed on the first day of the intervention (the treatment regiment at the Retreat) and then again on the final day of the intervention. The overall results for the subscales and the indices of SCL-90-R were then to be compared to determine if there was a decrease in the self-reported symptoms of the respective first responder participants. Relational correlations would also be considered with regard to occupation, gender, and age. The secondary focus of this dissertation was to determine how the six-day treatment affects specific scales on the Symptom Checklist-90-Revised (SCL-90-R) symptom inventory. Three hypotheses were proposed to address this interest.

Hypothesis 1

It is predicted that significant decreases in the Global Severity Index (GSI - designed to measure overall psychological distress) scores for first responders at the completion of the WCPR intervention – as compared to the symptom-representative scores reported upon their arrival at the Retreat.

Hypothesis 2

It is predicted that significant decreases in the Positive Symptom Distress Index (PSDI - designed to measure the intensity of symptoms) scores for first responders at the completion of the WCPR intervention – as compared to the symptom-representative scores reported upon their arrival at the Retreat.

Hypothesis 3

It is predicted that significant decreases in the Positive Symptom Total (PST – designed to represent the number or breadth of symptoms) scores for first responders at the completion of the WCPR intervention – as compared to the symptom-representative scores reported upon their arrival at the Retreat.

Literature Review

Traumatic events are powerful and overwhelming incidents that lie outside the range of usual human experience. Such incidents are capable of producing severe stress reactions in any human being, regardless of the person's normal abilities to cope successfully (Figley, 1985, 1986). Three types of catastrophic events have been found to result in traumatic stress: (1) natural catastrophes such as hurricanes, lightning-caused fires, tornadoes, or earthquakes; (2) accidental catastrophes, such as malfunctioning airplanes or vehicles resulting in fatalities; and, (3) human-induced catastrophes such as war, assault, robbery, sabotage, hostage-taking, arson, or murder. Individuals exposed to any of these catastrophes are at risk for developing traumatic stress reactions (Figley, 1985; Ochberg, 1988; van der Kolk, 1987).

Emergency responders, also referred to as “first responders,” are personnel called to the scene of a crisis or responding to emergency calls for assistance. First responders could include police officers, fire fighters, emergency medical technicians, hotline/crisis line personnel, child protective services, and others. These responders are frequently placed in dangerous and potentially life-threatening circumstances and are often intimately familiar with one or all three types of the catastrophic events.

Most responders, whether they are police officers, firefighters, paramedics, or support personnel, deal with both the routine and exceptional stresses by a variety of

situationally-adaptive coping and defense mechanisms. They tend to develop a certain adaptively defensive toughness of attitude and temperament which tends to be reinforced by their peers and through their training. Without this resolve, they could not do their jobs effectively (Miller, 1995). There are times, however, when, despite their resolve and training, their skills and defense mechanisms are incapable of addressing and processing the trauma to which they have been exposed. As Dr. Robert Ursano once eloquently described it, the trauma 'can make victims out of rescuers' (Ursano, Fullerton, & Norwood, 2003).

The daily demands of the first responders' occupations and the frequent and repetitive exposure to highly stressful events places them at an elevated level of risk for developing occupationally-derived, trauma-induced adjustment and mental health disorders with potentially substantial implications for their health, well-being, and job performance. The effects of routine stressors alone can have debilitating effects on these professionals. Coupled with exposure to traumatic incidents or stressors those routine stressors can result in a multitude of profound physiological, psychological, or behavioral problems for these individuals.

Trauma-responses for these emergency responders may include certain psychosocial symptoms such as: anxiety (Foa & Rothbaum, 1998); suicidality (Violanti, 2004); job burnout (Stinchcomb, 2004); memory problems (Beehr, Ivanitskaya, Glaser, Erofeev, & Canali, 2004); anxiety disorder (NOS); acute stress disorder; and, posttraumatic stress disorder (PTSD) (American Psychiatric Association, 2000; Finch, 2003). Related physical problems may include cardiovascular, neurological,

gastrointestinal, audiological, and pain symptoms (Van der Kolk, McFarlane, & Weisaeth, 1996). Furthermore, depression, cognitive impairments, and substance abuse are elevated in samples exposed to trauma as well as disaster work (Cross & Ashley, 2004); these sequelae represent alternative trajectories for the expression of adverse psychological reactions to trauma.

Following traumatic events, stress reactions experienced by the first responders may last days, weeks, or even longer. Responders commonly experience long-lasting depression, fear when reminded of the event, guilt, tension, feelings of withdrawal, irritability, and nightmares (Karlsson & Christianson, 2003). In certain cases, if the traumatic stress is not treated promptly and adequately, it has been shown that posttraumatic stress can result in permanent impairment and the individual may be unable to return to their pre-trauma level of functioning (Mitchell & Bray, 1990; Van der Kolk, 1987).

In recent years, efforts to minimize long-term psychiatric morbidity following traumatic events have resulted in calls for the routine provision of acute psychological interventions, also known as “debriefings,” for emergency responders who become victims of trauma. These debriefings, which tend to vary greatly in their design, approach, and staffing, are based on the assumption that the earlier intervention occurs, the less opportunity there is for maladaptive and disruptive cognitive and behavioral patterns to become established (Rachman, 1980). Although intuitively appealing,

whether or not these interventions work remains strenuously contested and the risks and benefits of these interventions are uncertain at the present (Deahl, 2000).

Within the research that has focused on these critical incident response debriefings, there are numerous anecdotal reports suggesting that providing debriefing for everyone involved in a traumatic experience reduces subsequent psychological morbidity (Mitchell, 1983; Armstrong, 1991). The acceptance of such claims has led to the widespread use of debriefing following traumatic events. In fact, it is now used routinely by many police departments, fire departments, and medical-service providers.

This single, stand-alone intervention is clearly popular with employers anxious to discharge their 'duty of care' as inexpensively as possible. Unfortunately, at present there is little, other than the anecdotal evidence, to demonstrate the effectiveness of this type of debriefing and the vast majority of published data suffers from various methodological difficulties (Deahl, 2000).

The more important shortcomings, most commonly cited by the critics of debriefing, include the lack of prospective controlled designs and the random allocation to treatment groups. Few studies have employed controlled designs with pre- and post-treatment measures (Fairbanks, 1987). Other important deficits inviting skepticism include a lack of pre-intervention data on subjects and a reliance on questionnaire results as opposed to validated interview data. Additionally, no two traumatic events are the same and comparing one incident with another is problematic. Unfortunately, standard

measures of the dimensions of the trauma are rarely recorded and comparisons are often made between relatively minor traumatic events and major disasters (Green, 1983).

Similar problems arise when single-event trauma is compared with sustained or repetitive traumatic events. Other factors known to influence psychological outcome are seldom considered. These include the context in which an event occurs as well as personal factors such as past psychiatric history, individual coping mechanisms and the presence of an acute stress reaction at the time of the trauma (Deahl, 2000).

In addition to the lack of supporting evidence and the methodological problems, it has become increasingly recognized that there may be risks associated with psychological debriefing and other forms of early psychological intervention. The provision of such services results in 'helpers' being exposed to the expression of powerful emotions by the victims of the trauma, making their work extremely stressful. An unfortunate corollary is the recognition that the service providers may themselves become 'secondary' victims (Talbot, 1990; Berah, Jones, & Valent, 1984; Rafael, 1986). Another risk is the possibility of passive participation and resentment engendered by mandatory psychological debriefing (Flannery, Fulton, Tausch, & DeLoffi, 1991). Finally, another danger of early intervention, discussed by McFarlane, is that over-enthusiasm for primary preventative methods might delay the institution of diagnosis and effective treatment for those who do suffer psychological sequelae (McFarlane, 1989). He argues that clear definition of the limitations of the crisis intervention approach and the point at which more formal treatment is required is needed.

It remains uncertain whether acute preventative interventions, such as debriefing, reduce the incidence of long-term psychological morbidity following trauma. The data available from mostly methodologically flawed studies suggest that, at best, psychological debriefing affords some sense of hope and understanding and, at worst, makes no difference and may even make some individuals worse. Certainly individuals receiving psychological debriefing are not immune to developing long-term psychological sequelae. And, where post-traumatic sequelae persist, or where the psychological problems relate to a longer-term pattern of maladaptive functioning, more extensive individual psychotherapeutic approaches are called for. Therefore, regardless of whether psychological debriefing is employed following traumatic events, formal follow up to identify individuals who do go on to develop serious psychopathology is vital (Deahl, 2000).

In direct response to this need for more intensive and directed therapy for emergency responders, a handful of residential treatment programs have been established and developed in the United States within the past decade. One of these programs is the West Coast Post-trauma Retreat (WCPR), located in Northern California.

The West Coast Post-trauma Retreat is an intensive treatment program in Marin County for first responders who are experiencing detrimental or debilitating symptoms after exposure to a critical incident or traumatic event. The WCPR utilizes a multi-modal, psycho-social model designed to mitigate the secondary effects that result from life-threatening, violent, or emotionally volatile situations encountered as part of the

demands associated with first responders (Dyregrov, 1997; Mitchell & Everly, 1996). The program's goal is to restore the equilibrium in the client's life. The aim of this approach is to challenge faulty cognitive beliefs through education, peer support, and clinical work. To accomplish this, staff members utilize an in-depth intake process, individual and group therapy, peer counseling and support, critical incident debriefing protocols, Eye Movement Desensitization and Reprocessing (EMDR), Narrative Exposure Therapy (NET), Cognitive Behavioral Trauma Therapy (CBTT), and family of origin work. The psycho-educational portions of their program include classes on alcohol and substance use, the physiological effects of stress during and after a critical incident, and goal planning and setting. A team of clinicians and trained peer staff provide these intensive six-day treatment programs to groups of 6-7 participants on a monthly basis.

To date, there has been very little research on the effectiveness of intensive, multi-modal treatment approaches, like the one utilized at the WCPR. The efficacy of this type of treatment program has yet to be assessed in depth and through the use of many of the pertinent assessment tools that are currently available. One such assessment tool is the Symptom Checklist-90-Revised.

The WCPR has recently begun administering the Symptom Checklist-90-Revised version to their clients upon their arrival and then again before leaving the program. The SCL-90-R (Derogatis, 1977) is a 90-item self-report inventory designed to identify psychological symptoms in psychiatric and medical patients and in non-patient groups. It

is widely used as an initial mental health assessment device as well as for ongoing clinical assessment and research activities. Each item is a description of a psychological symptom and is rated by respondents on a five-point response metric (0 to 4) as having caused them no discomfort to extreme discomfort during the past week. Average item response scores are calculated for nine primary factors. The SCL-90-R's nine primary symptom dimensions are: (1) Somatization – distress arising from perceptions of bodily dysfunction; (2) Obsessive-Compulsive – thoughts, impulses, and actions that are experienced as unremitting and irresistible and that are of an unwanted nature; (3) Interpersonal Sensitivity – feelings of inadequacy and inferiority, particularly in comparison with other people; (4) Depression – reflects a representative range of the manifestations of clinical depression; (5) Anxiety – general signs of anxiety such as nervousness, tension, and feelings of dread, apprehension, or terror; (6) Hostility – thoughts, feelings or actions that are characteristic of the negative affect state of anger; (7) Phobic Anxiety – the presence of a persistent fear response that is irrational and disproportionate to the stimulus and leads to avoidance or escape behavior; (8) Paranoid Ideation – paranoid behavior fundamentally as a disordered mode of thinking; and, (9) Psychoticism – designed to represent the construct as a continuous dimension of human experience (items are indicative of a withdrawn, isolated, schizoid lifestyle).

Additionally, three indices of general psychological distress are produced: (1) Global Severity Index – designed to measure overall psychological distress; (2) Positive Symptom Distress Index – designed to measure the intensity of symptoms; and, (3) Positive Symptom Total – reports number of self-reported symptoms (Carlozzi, 2008).

Research suggests that the SCL-90-R's scores make it a reliable and valid inventory. Internal consistency ranges from .77 to .90 for the subscales (Derogatis, Rickels, & Rock, 1976). Test-retest coefficients, at a one-week interval, range from .80 to .90 for the subscales (Derogatis, 1977). Pauker (1985) suggests that the levels of concurrent, convergent, discriminant, and construct validity of the SCL-90-R were also supported.

Currently, at the WCPR, the results of the second SCL-90-R assessment are simply being compared to their initial entry level of symptoms to assess change over the course of the week-long treatment. This information is then shared with clients and areas of possible concern are discussed and considered for additional treatment options. This data, however, has yet to be analyzed – comparing the results of all of the participating clients and testing the efficacy of the Retreat's treatment approach.

The focus of this study is to evaluate the West Coast Post-trauma Retreat's effectiveness in addressing and reducing the trauma-related symptoms present in their clients. This evaluation of the Retreat's efficacy would be performed by comparing the results of the pre- and post-treatment administration of the SCL-90-R. This comparison would be conducted for every client, to date, who has participated in taking this set of testing. The two sets of the SCL-90-R's scales would be compared in order to determine if there had been a decrease in the symptoms from the time of the client's arrival at the Retreat to the conclusion of the six-day treatment program. The Global Severity Index and the Positive Symptom Total results will be of particular interest as they will provide a

measure of potential changes in overall psychological distress levels and the number of self-reported symptoms experienced by the participants. Efficacy of the program will also be correlated with the age, occupation, and gender of the participants.

Methods

Participants were emergency personnel or first responders who voluntarily enrolled in a six-day intensive therapeutic retreat at the West Coast Post-trauma Retreat. Participants who typically attend the retreat are experiencing harmful or debilitating symptoms after exposure to one or more critical incidents and/or as a result of cumulative stressors associated with their professional and/or personal lives. Participants are both men (108 total) and women (23 total), all of whom are over the age of 18 years, with a sample age range from 24 to 63 years. The 131 participants were grouped into two categories, based on their occupation. The two categories consisted of: 1) Law Enforcement; and, 2) Fire Personnel & Others. "Law Enforcement" included: police officers; correctional officers; military personnel; police dispatchers; and, probation officers. "Fire Personnel & Others" included: firefighters; fire dispatchers; paramedics; and, others (five individuals who did not fall directly into the aforementioned groups). As part of the therapy regiment at the retreat, the Symptom Checklist-90-Revised instrument was given to and completed by each participant; upon their arrival at the facility and then again on their last day.

The distribution of participants by occupation and age is presented below.

Occupation

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid Law enforcement	95	72.5	72.5	72.5
Fire personnel & others	36	27.5	27.5	100.0
Total	131	100.0	100.0	

Age (yrs)

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid 24-40	62	47.3	47.3	47.3
>40	69	52.7	52.7	100.0
Total	131	100.0	100.0	

The distribution of participants by gender is presented below.

Gender

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid Male	108	82.4	82.4	82.4
Female	23	17.6	17.6	100.0
Total	131	100.0	100.0	

All three demographic variables are tabulated together in the table below.

Gender * Occupation * Age (yrs) Crosstabulation

				Occupation		Total
				Law enforcement	Fire personnel & others	
Count	24-40	Gender	Male	39	12	51
			Female	10	1	11
		Total	49	13	62	
	>40	Gender	Male	36	21	57
			Female	10	2	12
		Total	46	23	69	
% within Gender	24-40	Gender	Male	76.5%	23.5%	100.0%
			Female	90.9%	9.1%	100.0%
		Total	79.0%	21.0%	100.0%	
	>40	Gender	Male	63.2%	36.8%	100.0%
			Female	83.3%	16.7%	100.0%
		Total	66.7%	33.3%	100.0%	
% within Occupation	24-40	Gender	Male	79.6%	92.3%	82.3%
			Female	20.4%	7.7%	17.7%
		Total	100.0%	100.0%	100.0%	
	>40	Gender	Male	78.3%	91.3%	82.6%
			Female	21.7%	8.7%	17.4%
		Total	100.0%	100.0%	100.0%	
% of Total	24-40	Gender	Male	62.9%	19.4%	82.3%
			Female	16.1%	1.6%	17.7%
		Total	79.0%	21.0%	100.0%	
	>40	Gender	Male	52.2%	30.4%	82.6%
			Female	14.5%	2.9%	17.4%
		Total	66.7%	33.3%	100.0%	

Table 1. Gender, Occupation, and Age Cross-tabulation Table.

Criteria and Rationale for Inclusion/Exclusion of Participants

The criteria and rationale for the inclusion or exclusion of the participants required that all participants must be first responders, emergency responders, associated technicians, or emergency support personnel. All participants must be clients attending the West Coast Post-trauma Retreat and who remained at the facility for the entire six-day treatment plan. Participants must have completed the Symptom Checklist-90-Revised instrument, both upon their arrival at the facility and then again on their last day before leaving. Any participant who either declined to participate in the testing process, chose not to permit their individual testing results to be used in future research, or did not complete both of the Symptom Checklist-90-Revised tests were excluded from this study. No individuals under the age of eighteen years were included in this study (as the retreat is designed for and only accepts adults).

Instructions to Participants

The clinicians at the West Coast Post-trauma Retreat administered a phone intake interview before the clients arrived at the treatment facility (Appendix A). Upon the client's arrival, the client then participated in a structured peer intake interview (Appendix B). These interviews were used to collect demographic information regarding the client's gender, race/ethnicity, marital status, profession, age, education level,

working status, diagnosis, substance use, and suicidality level. Additional information was gathered regarding the length of time since the critical incident(s) occurred and the type of incident(s) in which the client might have been involved.

Confidentiality

Consent information was verbally reviewed in a group format. The potential use of the assessment measures (including the Symptom Checklist-90-Revised), for treatment and research purposes, was delineated. Clients were assured that they would not be personally identified in any resulting publications, and that they would receive feedback (from the clinicians at the retreat) about their progress, using these instruments. The client's participation was requested and they signed the HIPAA Notice of Privacy and Practice that outlines the use of information for research purposes. Alliant International University also reviewed this dissertation research project, prior to its start, to ensure that it was going to be conducted in accordance with the ethical principles of the American Psychological Association. Permission was requested and granted to use the clinical data, gathered in the course of the West Coast Post-trauma Retreat's treatment program and regiment, for this research.

Debriefing of Participants

At the conclusion of the intervention (the retreat) and the testing, the participants have the opportunity to ask questions or express comments regarding the treatment process and any associated research. At that time, interested participants may request their individual results of the findings associated with the Symptom Checklist-90-Revised

instrument. Attending clinicians can discuss the findings with the client during that meeting.

Instruments and Data Sources

One instrument, the Symptoms Checklist-90-Revised (SCL-90-R), was used for this study (the instrument is copyrighted and has therefore not been included in this protocol). The SCL-90-R is a 90-item self-report inventory designed to identify point-in-time (current) psychological symptoms in psychiatric and medical patients and in non-patient groups. The participants are instructed to indicate for each item “how much that problem has distressed or bothered you during the past seven days including today” on a scale from 0 (*not at all*) to 4 (*extremely*) (Derogatis, 1977). The SCL-90-R is designed to reflect nine primary symptom dimensions: Somatization (SOM); Obsessive–Compulsive Behavior (O-C); Interpersonal Sensitivity (I-S); Depression (DEP); Anxiety (ANX); Hostility (HOS); Phobic Anxiety (PHOB); Paranoid Ideation (PAR); and, Psychoticism (PSY). It also contains three indices of general distress: the Global Severity Index (GSI - designed to measure overall psychological distress); Positive Symptom Distress Index (PSDI - designed to measure the intensity of symptoms); and, Positive Symptom Total (PST – reports number of self-reported symptoms). In addition to the nine primary symptom dimensions and the three indices, a PTSD subscale has been devised for use with the SCL-90-R (Saunders et al., 1990); however, the WCPR did not have or provide data for this subscale. Therefore, it was not incorporated into this study.

Research from Carlozzi and Long (2008) suggests that the SCL-90-R is a reliable and valid inventory. Internal consistency ranges from .77 to .90 for the subscales (Derogatis, Rickels, & Rock, 1976). Test-retest coefficients, at a one-week interval, range from .80 to .90 for the subscales (Derogatis, 1977). Pauker (1985) suggests that the levels of concurrent, convergent, discriminant, and construct validity of the SCL-90-R were also supported (Carlozzi & Long, 2008). The reliability and validity of this instrument, coupled with the focused and inclusive subscales, makes the measure appropriate for the demographics represented at the WCPR.

Amount of Time Required of Participants

The Symptom Checklist-90-Revised requires approximately 12-15 minutes (on average) to complete the 90-item instrument. The phone intake (Appendix A) and peer intake interviews (Appendix B) varied in length for each client and session. The phone intake requires approximately 30 minutes and the peer intake interview typically requires two hours.

Results

Data was culled from the Symptom Checklist-90 – Revised, which had been administered by clinicians at the West Coast Post-trauma Retreat. The data, collected over a two-year period (2010-2011) included the pre- and post-intervention SCL-90-R scores of 131 clients who participated in the six-day treatment program. Data associated with clients who had not completed both the pre- and post-intervention test or had failed to complete either test in its entirety was excluded from this study and had been removed from the database prior to being released for usage for this research project.

Inferential Statistics

In order to assess the effect of the Retreat's treatment program, the SCL-90-R data (T-scores for each of the participants for the nine subscales and the three indices) provided by the staff at the WCPR, was first placed in an Excel file. This file was then cleaned and prepared for export to SPSS (a computer program used for data mining and statistical analysis). New categorical variables for **occupation** and **age** and **gender** were created based on the original data (see Appendix C for definition of terms in bold font). An SPSS data file was then created for analysis. The data was then run through a series

of tests, which included: paired t-tests; repeated measures ANOVA; tests of between-subjects effects; and, tests of within-subjects effects.

Initial Data Analysis

The box plot below provides a visual analogue for the statistics provided in the tables (**Descriptives** above and **Percentiles** below). The box encompasses the central 50 percent of the distribution – the lower boundary represents the 25th percentile and the upper boundary the 75th percentile. The red line inside the box is the median (50th percentile). The vertical lines at each end of the box are called whiskers – they represent data points (scores) that are not outliers, but whose values are smaller than the 25th percentile value or greater than the value of the 75th percentile. Any point beyond the horizontal line at the end of either vertical line is considered an **outlier**. There are two kinds of outliers: **regular** outliers and **extreme** outliers. If a data point has a value worth 1.5 times the interquartile range (IQR) subtracted from the value of the 25th percentile ($25\text{th percentile} - [1.5 \times \text{IQR}]$) or added to the value of the 75th percentile ($75\text{th percentile} + [1.5 \times \text{IQR}]$) that observation is considered an outlier of the first type. If the value of the data point is 3 times the IQR subtracted from the value of the 25th percentile ($25\text{th percentile} - [3 \times \text{IQR}]$) or added to the value of the 75th percentile ($75\text{th percentile} + [3 \times \text{IQR}]$) that observation is considered an extreme outlier. In the box plots, presented below, regular outliers are symbolized by a circle and extreme outliers by an asterisk.

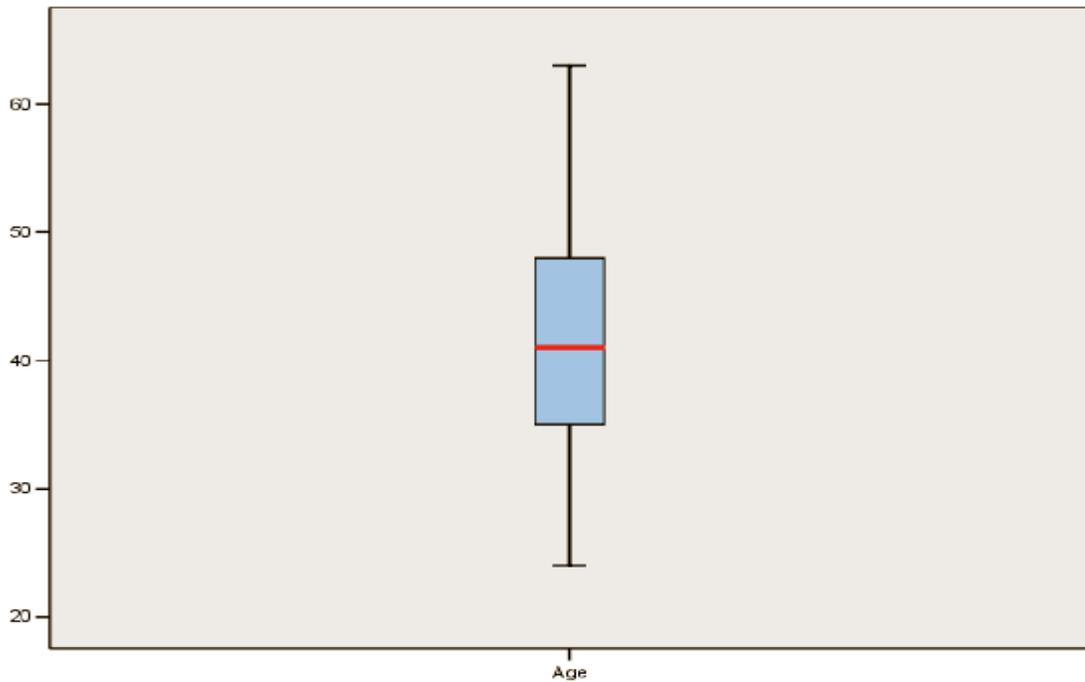


Figure 1. Box Plot Representing Age Component

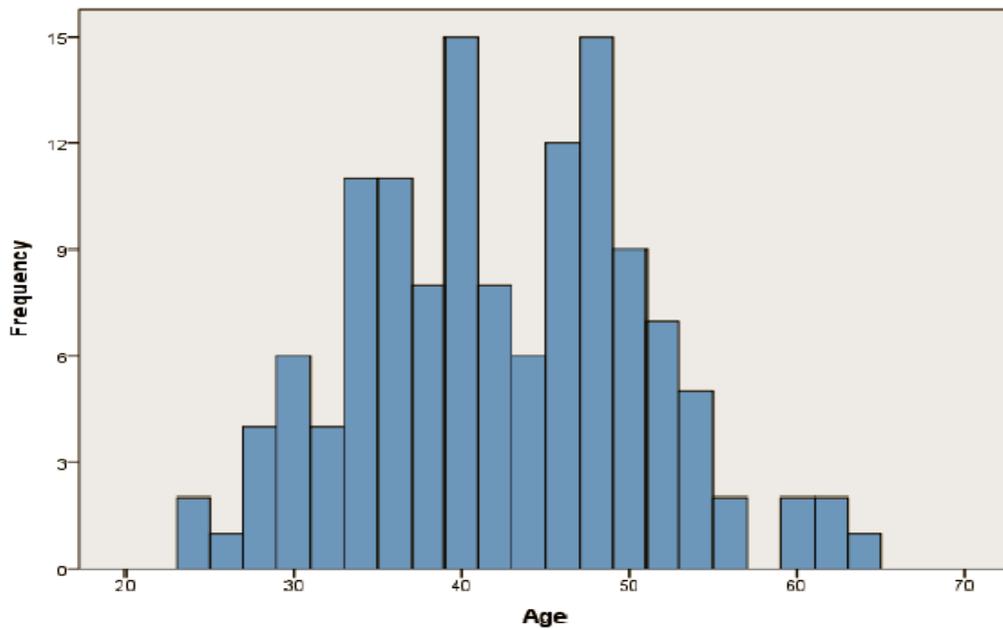


Figure 2. Histogram of Distribution of the Represented Ages of the Participants.

Descriptives			Statistic	Std. Error
Age	Mean		41.76	.741
	95% Confidence Interval for Mean	Lower Bound	40.30	
		Upper Bound	43.23	
	5% Trimmed Mean		41.63	
	Median		41.00	
	Variance		71.982	
	Std. Deviation		8.484	
	Minimum		24	
	Maximum		63	
	Range		39	
	Interquartile Range		13	
	Skewness		.146	.212
	Kurtosis		-.380	.420

Table 2. Descriptives – Age.

			Descriptives			
			Occupation			
			Law enforcement		Fire personnel & others	
		Statistic	Std. Error	Statistic	Std. Error	
Age	Mean		40.76	.835	44.42	1.486
	95% Confidence Interval for Mean	Lower Bound	39.10		41.40	
		Upper Bound	42.42		47.43	
	5% Trimmed Mean		40.69		44.35	
	Median		40.00		45.50	
	Variance		66.228		79.507	
	Std. Deviation		8.138		8.917	
	Minimum		24		28	
	Maximum		62		63	
	Range		38		35	
	Interquartile Range		12		14	
	Skewness		.161	.247	-.023	.393
	Kurtosis		-.240	.490	-.562	.768

Table 3. Descriptives – Occupation.

Law enforcement first responders are, on average, nearly four years younger (40.8) than the Fire personnel & Others group (44.4). This difference is statistically significant ($t = -2.237, df = 129, p < .05$).

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Male	108	82.4	82.4	82.4
	Female	23	17.6	17.6	100.0
	Total	131	100.0	100.0	

Table 4. Descriptives – Gender.

Males represented over eighty percent ($n = 108$, 82.4%) of first responders; females less than twenty percent ($n = 23$, 17.6%).

There is no statistically significant difference in age between male (42.1) and female (40.4) first responders ($t = .826$, $df = 129$, $p > .10$).

			Gender			
			Male		Female	
			Statistic	Std. Error	Statistic	Std. Error
Age	Mean		42.05	.795	40.43	1.992
	95% Confidence Interval for Mean	Lower Bound	40.47		36.30	
		Upper Bound	43.62		44.57	
	5% Trimmed Mean		41.84		40.32	
	Median		41.00		42.00	
	Variance		68.231		91.257	
	Std. Deviation		8.260		9.553	
	Minimum		27		24	
	Maximum		63		60	
	Range		36		36	
	Interquartile Range		13		14	
	Skewness		.292	.233	-.229	.481
	Kurtosis		-.422	.461	-.512	.935

Table 5. Descriptives – Gender Comparison.

The next series of graphs are presented to describe the overall change in the nine symptom subscales and the three global indices (see also Appendix D for scatter plot representations). The box plots show that the distributions of scores after the intervention (graph on the right) have shifted down compared to the distribution of the baseline scores. The dashed horizontal lines in the graphs represent the overall mean across all nine symptom scales and three global indices. The baseline mean was 70.46 and the post-intervention score was 55.55 – a decrease of 14.91.

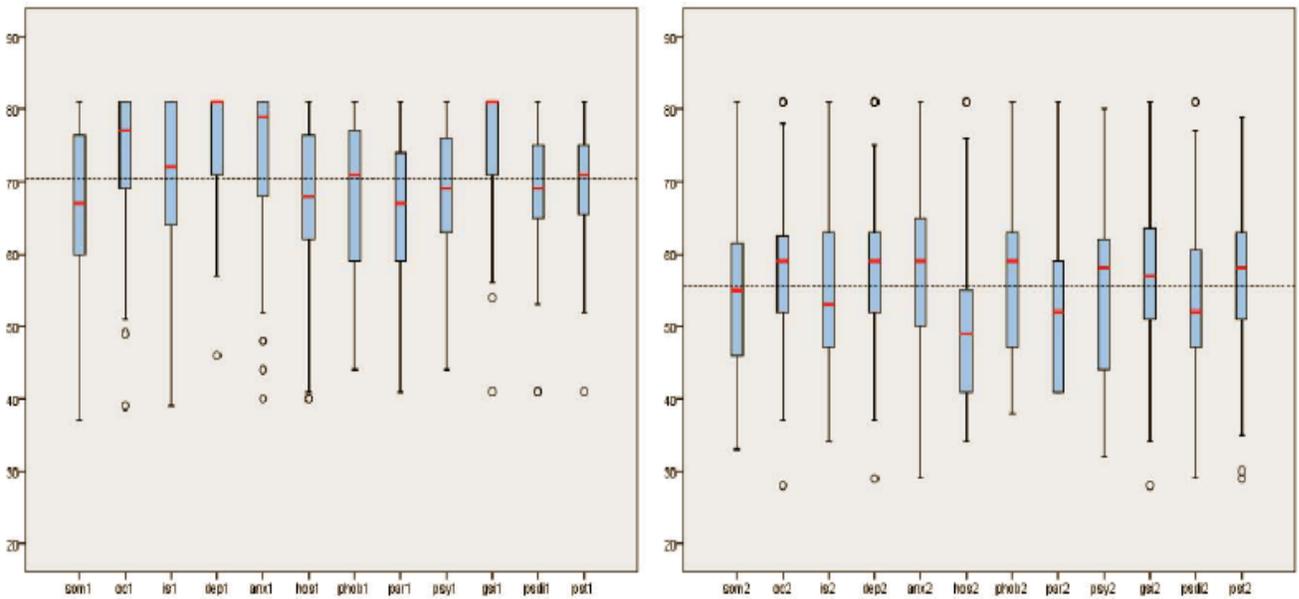


Figure 3. Box Plots of Symptom Scales and Indices

The line graph on the next page describes the percentage of the 131 participants whose score for their post-intervention responses was lower than their baseline responses.

The scales have been sorted in descending order based on the percentage. It shows that PSDI is the scale with the largest percentage of participants (95.4%) whose scores decreased at post-intervention, compared to their baseline scores. PHOB is the scale that had the smallest percentage of participants (80.1%) whose scores decreased at post-intervention compared to baseline.

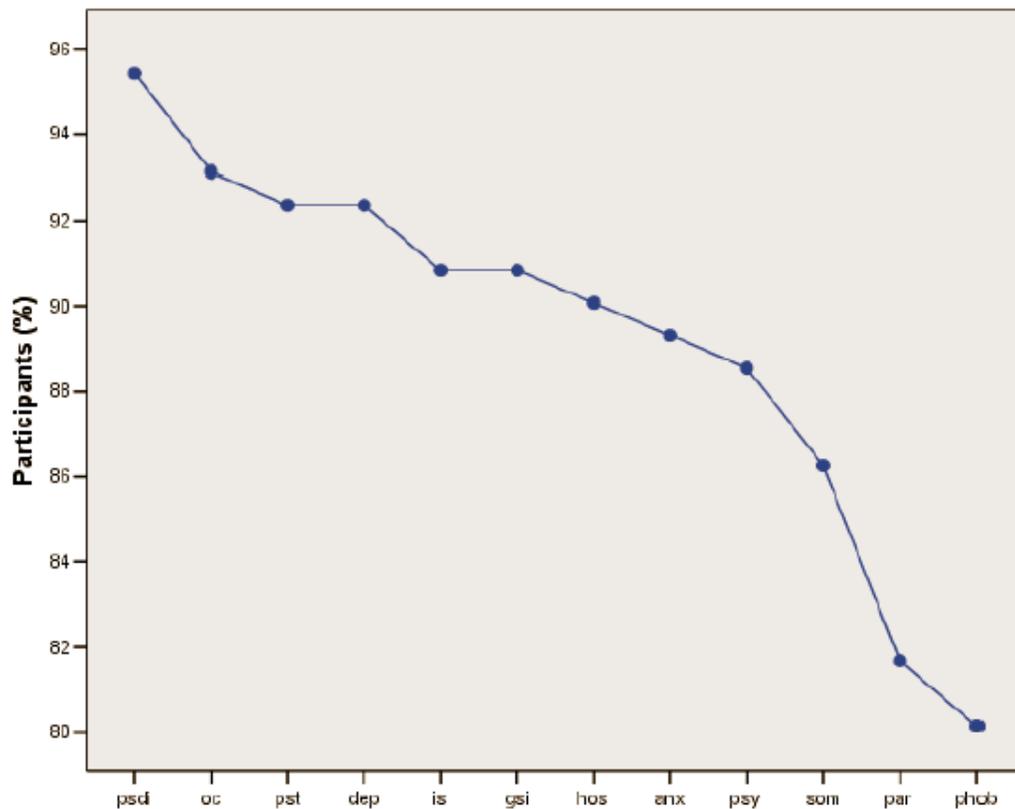


Figure 4. Line Graph – Representing Percentage of Participants Reporting a Decrease in Symptoms, post-Retreat.

The next set of tables provides statistics on the scales, pre- and post-intervention, by demographic grouping (age, occupation and gender). On average, there was a near 15 point (14.91) mean decrease between pre- and post-intervention scores: HOS decreased the most, by nearly 18 points (17.85) and PHOB the least with nearly 11 points (10.61).

som1 oc1 is1 dep1 anx1 hos1 phob1 par1 psy1 gsi1 psdi1 pst1 * Age (yrs)							som2 oc2 is2 dep2 anx2 hos2 phob2 par2 psy2 gsi2 psdi2 pst2 * Age (yrs)						
	Age (yrs)							Age (yrs)					
	24-40			>40				24-40			>40		
	Mean	Median	Std. Deviation	Mean	Median	Std. Deviation		Mean	Median	Std. Deviation	Mean	Median	Std. Deviation
som1	65.56	66.50	12.183	67.96	67.00	10.232	som2	53.06	55.00	11.228	54.84	55.00	10.942
oc1	73.48	77.00	9.229	73.28	76.00	8.768	oc2	56.26	58.50	10.497	59.12	59.00	9.546
is1	71.92	75.00	9.870	71.14	70.00	9.737	is2	53.15	53.00	10.316	55.17	56.00	10.510
dep1	76.11	81.00	7.322	75.07	81.00	6.963	dep2	56.66	59.00	10.851	59.51	60.00	10.796
anx1	74.65	81.00	9.341	72.59	74.00	8.866	anx2	57.94	56.00	12.100	57.72	60.00	11.932
hos1	70.77	72.00	10.221	64.87	65.00	11.329	hos2	51.40	49.00	10.882	48.38	47.00	10.168
phob1	68.84	70.50	9.835	67.38	71.00	11.972	phob2	58.76	59.00	10.354	56.29	59.00	10.070
par1	64.89	65.00	11.388	65.90	67.00	10.742	par2	50.90	49.00	9.254	54.32	53.00	10.920
psy1	69.24	72.00	10.357	68.16	68.00	9.182	psy2	55.92	58.00	10.465	56.26	58.00	9.629
gsi1	75.69	81.00	8.319	75.16	81.00	7.114	gsi2	56.87	56.50	11.122	58.45	57.00	10.465
psdi1	69.44	71.00	8.452	69.13	68.00	7.759	psdi2	53.13	52.00	10.257	53.81	52.00	9.568
pst1	70.42	72.50	7.065	69.93	71.00	6.030	pst2	56.69	58.00	10.713	57.94	58.00	9.068

Table 6. Pre- and Post-Intervention Comparison, Categorized by Age.

On average, between baseline and post-intervention, the younger cohort's mean score decreased a little more (15.86) than the older group (14.06). At baseline, younger first responders (70.92) had generally higher scores (except on SOM and PAR) than the older group (70.05); but, differences were small – the largest one occurring on HOS (5.9). At post-intervention, the younger had, on average, a lower score (55.06) than the older group (55.98); but, once again, the differences were small – the largest one occurring on PAR (3.42).

som1 oc1 is1 dep1 anx1 hos1 phob1 par1 psy1 gsi1 psdi1 pst1 * Occupation							som2 oc2 is2 dep2 anx2 hos2 phob2 par2 psy2 gsi2 psdi2 pst2 * Occupation						
	Occupation							Occupation					
	Law enforcement			Fire personnel & others				Law enforcement			Fire personnel & others		
	Mean	Median	Std. Deviation	Mean	Median	Std. Deviation		Mean	Median	Std. Deviation	Mean	Median	Std. Deviation
som1	66.83	66.00	11.559	66.81	66.00	10.419	som2	53.35	54.00	11.237	55.72	56.50	10.579
oc1	72.88	76.00	9.298	74.67	77.50	7.957	oc2	57.72	59.00	10.553	57.89	59.00	8.808
is1	70.85	70.00	9.903	73.25	78.00	9.321	is2	53.93	53.00	10.754	54.97	54.50	9.620
dep1	75.01	81.00	7.365	77.03	81.00	6.318	dep2	58.12	59.00	11.419	58.28	60.50	9.431
anx1	73.14	79.00	9.355	74.89	81.00	8.475	anx2	57.40	57.00	12.803	58.94	60.00	9.478
hos1	68.51	70.00	11.233	65.44	65.00	10.867	hos2	50.28	49.00	11.104	48.56	49.00	9.079
phob1	68.09	71.00	11.152	68.00	70.00	10.725	phob2	58.06	59.00	10.440	55.86	58.00	9.654
par1	65.15	68.00	10.807	66.14	67.50	12.175	par2	52.40	52.00	10.590	53.50	51.00	9.470
psy1	68.13	69.00	9.733	70.11	72.00	9.721	psy2	55.58	58.00	9.902	57.47	58.00	10.252
gsi1	74.78	81.00	8.023	77.08	81.00	6.509	gsi2	57.38	56.00	11.455	58.56	58.50	8.788
psdi1	68.91	69.00	8.362	70.25	70.00	7.240	psdi2	52.66	52.00	10.257	55.67	52.50	8.505
pst1	70.01	71.00	6.872	70.56	71.50	5.552	pst2	57.27	57.00	10.518	57.56	58.00	8.005

Table 7. Pre- and Post-Intervention Comparison, Categorized by Occupation.

Law enforcement first responders' scores between baseline and post-intervention declined on average slightly less (14.84) than those of other first responders (15.09); but, the differences were small. Law enforcement first responders had slightly lower baseline scores (70.19) than other first responders (71.17). This was also the case for post-intervention score – 55.35 and 56.08, respectively.

som1 oc1 is1 dep1 anx1 hos1 phob1 par1 psy1 gsi1 psdi1 pst1 * Gender							som2 oc2 is2 dep2 anx2 hos2 phob2 par2 psy2 gsi2 psdi2 pst2 * Gender						
	Gender							Gender					
	Male			Female				Male			Female		
	Mean	Median	Std. Deviation	Mean	Median	Std. Deviation		Mean	Median	Std. Deviation	Mean	Median	Std. Deviation
som1	66.78	67.00	11.467	67.04	65.00	10.196	som2	54.44	55.00	11.510	51.91	52.00	8.628
oc1	73.78	77.00	9.257	71.48	72.00	7.248	oc2	58.08	59.00	10.183	56.26	57.00	9.597
is1	72.42	76.00	9.917	67.26	69.00	7.927	is2	55.10	53.00	10.701	50.04	50.00	7.980
dep1	76.62	81.00	7.085	70.61	69.00	4.979	dep2	58.57	59.00	11.304	56.22	56.00	8.512
anx1	74.37	81.00	8.866	69.78	72.00	9.520	anx2	58.57	60.00	11.898	54.30	52.00	11.914
hos1	67.93	68.00	11.761	66.43	68.00	7.965	hos2	49.48	49.00	10.288	51.35	48.00	11.987
phob1	68.69	71.00	10.675	65.17	68.00	12.228	phob2	58.33	59.00	10.032	53.35	54.00	10.434
par1	65.73	67.00	11.428	63.96	66.00	8.937	par2	52.93	51.00	10.703	51.65	52.00	8.049
psy1	69.23	70.00	9.631	66.04	65.00	9.993	psy2	56.09	58.00	10.358	56.13	58.00	8.286
gsi1	76.16	81.00	7.709	71.91	72.00	6.646	gsi2	58.10	57.50	11.247	55.83	55.00	8.094
psdi1	69.36	70.00	8.259	68.87	69.00	7.232	psdi2	53.53	52.00	10.026	53.30	53.00	9.295
pst1	70.65	72.00	6.772	67.87	68.00	4.635	pst2	57.72	58.00	10.371	55.61	55.00	6.913

Table 8. Pre- and Post-Intervention Comparison, Categorized by Gender.

Male first responders, on average, had a slightly higher decline (15.06) in mean score between baseline and post-intervention than did female first responders (14.21).

Male responders had a slightly higher mean score (70.98) at baseline than female responders (60.04); such was the case at after intervention – 55.91 and 53.83, respectively. Differences between male and female were always less than 3 points – 2.98 at baseline and 2.40 after intervention.

Paired T-Tests

Initially Paired t-tests (paired samples tests) were performed for the nine SCL-90-R subscales and the three global indices (Appendix P through Appendix V). The table below presents the results of the Paired t-tests. The column entitled “Mean” refers to the

mean difference between participants' scores before the retreat and their scores after the retreat.

Paired Samples Test

		Paired Differences					t	df	Sig. (2-tailed)
		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference				
					Lower	Upper			
Pair 1	som1 - som2	12.824	11.548	1.009	10.829	14.820	12.713	130	.000
Pair 2	oc1 - oc2	15.611	8.481	.741	14.145	17.077	21.087	130	.000
Pair 3	is1 - is2	17.298	10.777	.942	15.435	19.161	18.370	130	.000
Pair 4	dep1 - dep2	17.405	9.898	.847	15.729	19.081	20.545	130	.000
Pair 5	anx1 - anx2	15.740	10.265	.897	13.988	17.515	17.550	130	.000
Pair 6	hos1 - hos2	17.855	11.869	1.037	15.803	19.908	17.219	130	.000
Pair 7	phob1 - phob2	10.611	9.458	.826	8.976	12.246	12.840	130	.000
Pair 8	par1 - par2	12.718	10.020	.875	10.988	14.450	14.527	130	.000
Pair 9	psy1 - psy2	12.573	9.548	.834	10.922	14.223	15.074	130	.000
Pair 10	gsi1 - gsi2	17.710	9.310	.813	16.101	19.319	21.771	130	.000
Pair 11	psdi1 - psdi2	15.788	8.683	.759	14.285	17.287	20.808	130	.000
Pair 12	pst1 - pst2	12.809	8.076	.706	11.413	14.205	18.154	130	.000

Table 9. Paired Samples Test Results.

All the differences listed in the table (Table 9) are statistically significant (see “Sig. (2-tailed)” column); therefore, we conclude that the retreat has had an effect on the participants' scores (i.e., lowering all mean scores compared to the baseline).

Paired T-Tests by Occupation

The next three tables present the results of the same paired t-tests but, this time, by occupation. Differences on all nine symptom scales and all three indices are statistically significant in both occupational groups.

First Responders – Statistical Tests Results

			Occupation		
			Law enforcement	Fire personnel & others	
Pair 1	som1 - som2	Mean	13.484	11.083	
		Std. Deviation	11.803	10.803	
		95% Confidence Interval of the Difference	Lower	11.080	7.428
			Upper	15.889	14.739
		t	11.135	6.156	
		df	94	35	
		Sig. (2-tailed)	.000	.000	
		Pair 2	oc1 - oc2	Mean	15.168
Std. Deviation	8.594			8.177	
95% Confidence Interval of the Difference	Lower			13.418	14.011
	Upper			16.919	19.544
t	17.202			12.311	
df	94			35	
Sig. (2-tailed)	.000			.000	
Pair 3	is1 - is2			Mean	16.926
		Std. Deviation	11.244	9.513	
		95% Confidence Interval of the Difference	Lower	14.636	15.059
			Upper	19.217	21.496
		t	14.672	11.528	
		df	94	35	
		Sig. (2-tailed)	.000	.000	
		Pair 4	dep1 - dep2	Mean	16.895
Std. Deviation	9.870			9.219	
95% Confidence Interval of the Difference	Lower			14.884	15.631
	Upper			18.905	21.869
t	16.684			12.203	
df	94			35	
Sig. (2-tailed)	.000			.000	

Table 10. Paired Samples Test - Occupation (SOM, O-C, I-S, and DEP).

First Responders – Statistical Tests Results

			Occupation		
			Law enforcement	Fire personnel & others	
Pair 1	anx1 - anx2	Mean	15.737	15.750	
		Std. Deviation	10.072	10.906	
		95% Confidence Interval of the Difference	Lower	13.685	12.060
			Upper	17.789	19.440
		t	15.228	8.665	
		df	94	35	
		Sig. (2-tailed)	.000	.000	
Pair 2	hos1 - hos2	Mean	18.221	16.889	
		Std. Deviation	12.304	10.738	
		95% Confidence Interval of the Difference	Lower	15.715	13.256
			Upper	20.727	20.522
		t	14.434	9.437	
		df	94	35	
		Sig. (2-tailed)	.000	.000	
Pair 3	phob1 - phob2	Mean	10.032	12.139	
		Std. Deviation	9.751	8.580	
		95% Confidence Interval of the Difference	Lower	8.045	9.236
			Upper	12.018	15.042
		t	10.028	8.489	
		df	94	35	
		Sig. (2-tailed)	.000	.000	
Pair 4	par1 - par2	Mean	12.747	12.639	
		Std. Deviation	9.661	11.056	
		95% Confidence Interval of the Difference	Lower	10.779	8.898
			Upper	14.715	16.380
		t	12.860	6.859	
		df	94	35	
		Sig. (2-tailed)	.000	.000	

Table 11. Paired Samples Test - Occupation (ANX, HOS, PHOB, and PAR).

First Responders – Statistical Tests Results

			Occupation		
			Law enforcement	Fire personnel & others	
Pair 1	psy1 - psy2	Mean	12.547	12.639	
		Std. Deviation	9.415	10.020	
		95% Confidence Interval of the Difference	Lower	10.630	9.248
			Upper	14.465	16.029
		t	12.990	7.568	
		df	94	35	
		Sig. (2-tailed)	.000	.000	
Pair 2	gsi1 - gsi2	Mean	17.400	18.528	
		Std. Deviation	9.336	9.324	
		95% Confidence Interval of the Difference	Lower	15.498	15.373
			Upper	19.302	21.683
		t	18.166	11.922	
		df	94	35	
		Sig. (2-tailed)	.000	.000	
Pair 3	psdi1 - psdi2	Mean	16.242	14.583	
		Std. Deviation	9.251	6.938	
		95% Confidence Interval of the Difference	Lower	14.357	12.236
			Upper	18.127	16.931
		t	17.112	12.612	
		df	94	35	
		Sig. (2-tailed)	.000	.000	
Pair 4	pst1 - pst2	Mean	12.737	13.000	
		Std. Deviation	8.228	7.768	
		95% Confidence Interval of the Difference	Lower	11.081	10.372
			Upper	14.413	15.628
		t	15.087	10.041	
		df	94	35	
		Sig. (2-tailed)	.000	.000	

Table 12. Paired Samples Test - Occupation (PSY, GSI, PSDI, and PST).

Repeated Measures ANOVA

One inconvenience of performing the same tests (e.g. paired t-tests) on the same data is that it inflates the risk of committing a Type I Error (rejecting the null hypothesis

when it is true; i.e., a false positive). The null hypothesis, which is the hypothesis that is being tested, states that the observed differences between the scores before and after the Retreat are the results of chance, not as a result of the treatment (the Retreat's intervention) – although here the differences are so large that they are unlikely to be an artifact of multiple testing. It must be noted that when performing multiple tests, aside from the probability of finding a difference significance when there is not ($\alpha = .05$, at each test), an additional element of chance is introduced – such that the actual (as opposed to the stated) level of significance α is not $\alpha = .05$ but $(1 - \alpha)^k$, where k is the number of tests performed on the data, and $\alpha > \alpha$, i.e., $\alpha > .05$.

To avoid these kinds of problems, statistical tests, such as the Analysis of Variance (ANOVA) have been developed. Accordingly, a repeated-measures ANOVA with *occupation* and *age* as additional independent variables was employed. To perform this test, an overall baseline score was first computed by taking the mean of all 12 items (nine symptom scales and three global indices; i.e., mean of Somatization through Positive Symptom Total) before the Retreat. Secondly, an overall score, based on the scores obtained on the same 12 items, were computed using the data obtained after the Retreat. The purpose of using ANOVA is to first determine whether the treatment (the intervention) has had an effect on the overall scores (difference between baseline and Retreat scores), and, if so, whether the effect differs by *occupation* and *age*. Finally, whether there is an interaction between *occupation* and *age* with regard to the effect on the Retreat. The results are presented on the next page.

The Descriptive Statistics table below provides the mean, standard deviation, and sample size for the before and after intervention scores by *occupation* and *age*.

Table 13. Descriptive Statistics – Occupation and Age.

First Responders – Statistical Tests Results

Descriptive Statistics						
	Occupation	Age (yrs)	Mean	Std. Deviation	N	
Baseline	Law enforcement	24-40	70.3	8.174	49	
		>40	70.1	7.036	46	
		Total	70.2	7.604	95	
	Fire personnel & others	24-40	73.2	5.026	13	
		>40	70.0	6.428	23	
		Total	71.2	6.085	36	
	Total	24-40	70.9	7.677	62	
		>40	70.0	6.791	69	
		Total	70.5	7.209	131	
	After retreat	Law enforcement	24-40	55.3	9.519	49
			>40	55.4	9.031	46
			Total	55.3	9.237	95
Fire personnel & others		24-40	54.2	4.955	13	
		>40	57.2	7.386	23	
		Total	56.1	6.695	36	
Total		24-40	55.1	8.738	62	
		>40	56.0	8.505	69	
		Total	55.5	8.595	131	

Tests of Between-Subjects Effects

Measure: MEASURE_1

Transformed Variable: Average

Source	Type III Sum of Squares	df	Mean Square	F	Sig.
Intercept	786384.981	1	786384.981	7827.506	.000
work2	37.378	1	37.378	.372	.543
age2	.365	1	.365	.004	.952
work2 * age2	.004	1	.004	.000	.995
Error	12758.968	127	100.464		

Table 14. Tests of Between-Subjects Effects.

The Tests of Between-Subjects Effects (on the previous page) tells us that there are no statistically significant differences in scores between the two occupational groups (work2: $F = .372, p > .05$) or age groups (age2: $F = .004, p > .05$), nor among the groups formed by the combination of *age* and *occupation* (work2 * age2: $F = .000, p > .05$).

Tests of Within-Subjects Effects

Measure: MEASURE_1

Source		Type III Sum of Squares	df	Mean Square	F	Sig.
retreat	Sphericity Assumed	11659.312	1	11659.312	435.238	.000
retreat * work2	Sphericity Assumed	15.018	1	15.018	.561	.455
retreat * age2	Sphericity Assumed	130.585	1	130.585	4.875	.029
retreat * work2 * age2	Sphericity Assumed	103.872	1	103.872	3.877	.051
Error(retreat)	Sphericity Assumed	3402.122	127	26.788		

Table 15. Within-Subjects Effects.

Tests of Within-Subjects Effects

The tests of Within-Subjects Effects (Table 14) indicates that the Retreat's intervention has had a significant effect on participants' scores ($F = 435.2, p < .001$). It also indicates that there is no significant interaction between the *retreat* and *occupation* ($F = .561, p > .05$). In other words, the *retreat* had the same effect irrespective of

occupation. However, there is a significant interaction between *retreat* and *age* ($F = 4.875, p < .05$).

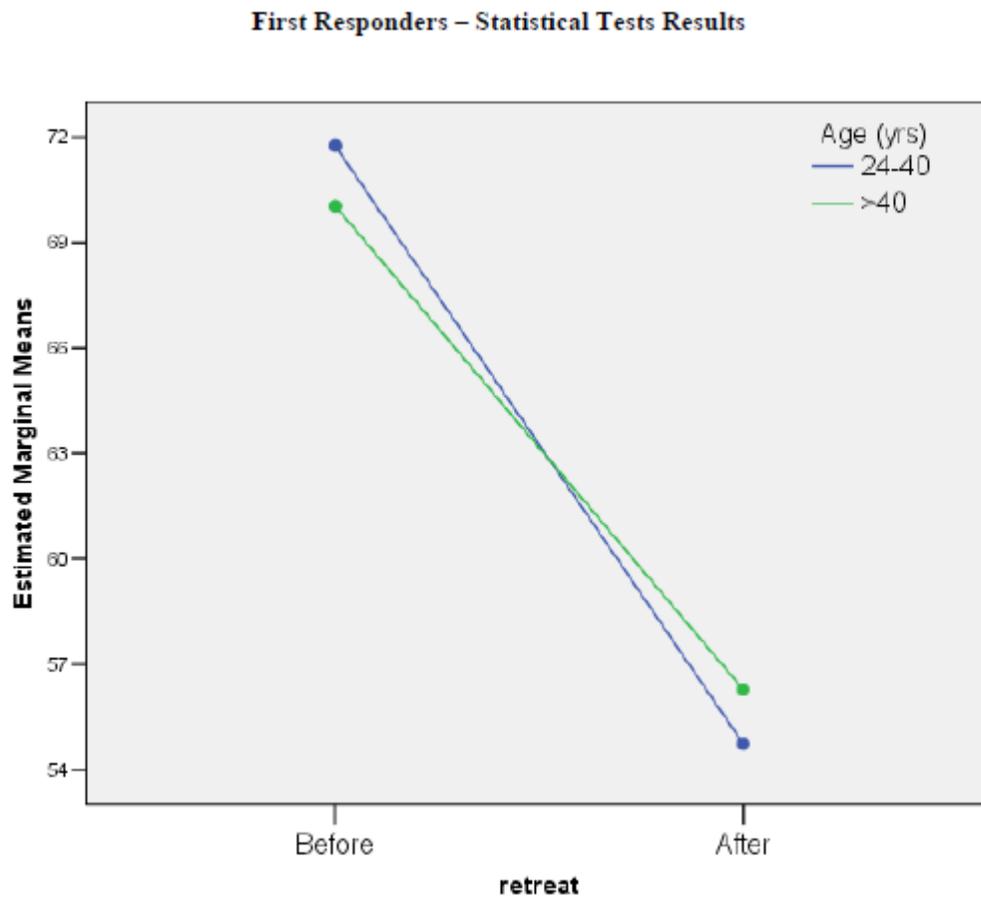


Figure 5. Estimated Marginal Means – Age.

Finally, there is a marginally significant three-way interaction between *retreat*, *occupation*, and *age* ($F = 3.877, .05 < p < .10$). The graph on the next page illustrates this interaction. It shows that among the younger cohort, Fire Personnel & Others had a higher score at baseline than their counterparts in Law Enforcement, but they ended up

with a lower score after the *retreat* (as seen in Figure 6). Among the older cohort, the *retreat* appears to have had a greater impact on Law Enforcement participants than on Fire Personnel & Others although both occupational groups have roughly the same baseline. However, Law Enforcement participants end up with a lower score than Fire Personnel & Others after the *retreat*. In other words, it would appear that the effect of the *retreat* is higher for Fire Personnel & Others among younger participants and higher for Law Enforcement workers among older participants.

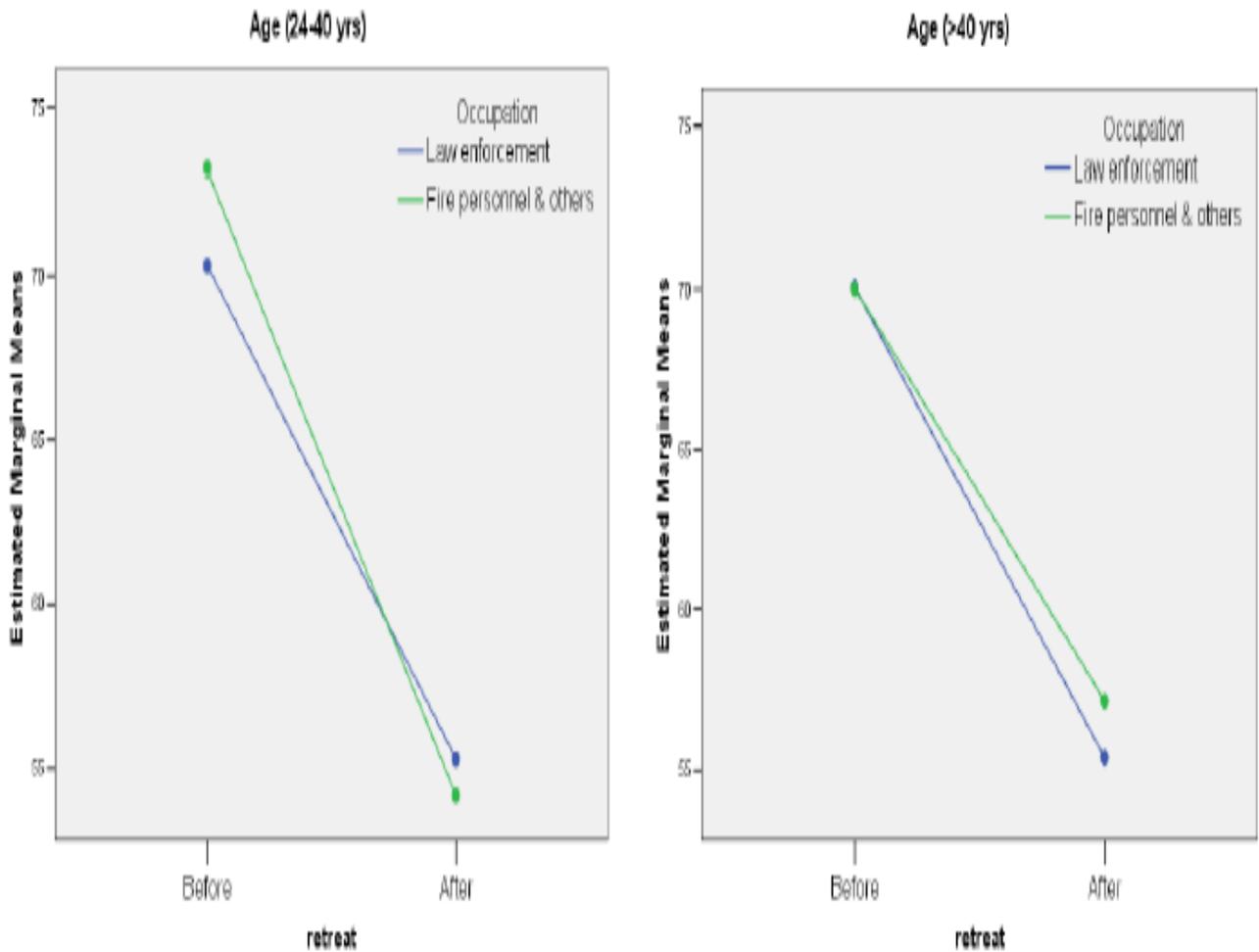


Figure 6. Estimated Marginal Means – Age and Occupation.

Discussion

First responders perform very stressful jobs and are frequently exposed to horrific and traumatic events. The combination of stressors of every day life, coupled with the intimate exposure to highly stressful events can result in a multitude of profound physiological, psychological, or behavioral problems for these workers. These problems can have debilitating effects on these individuals, ranging in persistence from merely a few hours to years. In certain cases, if the traumatic stress is not treated quickly and effectively, it has been shown that the emergency responders can experience an associated level of impairment that lasts for years – affecting their careers, families, and health. Consequently, it is critically important that the profound effects and sequelae resulting from trauma-related stressors be studied and that appropriate treatment programs and approaches be developed to treat them.

At present, very little research has been conducted involving the efficacy of the few existing, intensive, multi-modal treatment programs that have been established and designed to treat these first responders here in the United States. In response to this dearth of research, this study was conducted with the goal of assessing the effectiveness of one of these facilities – the West Coast Post-Trauma Retreat, in the Bay Area. Through the employment of the Symptom Checklist-90-Revised inventory (designed to identify point-in-time psychological symptoms), it was possible to assess the efficacy of this treatment program.

In reviewing the results of the Symptom Checklist-90-Revised pre- and post-intervention comparison of the West Coast Post-trauma Retreat participants, law enforcement first responders were, on average, nearly four years younger (40.8) than the Fire Personnel & Others group (44.4). This difference was statistically significant ($t = -2.237, df = 129, p < .05$). Males represented over eighty percent ($n = 108, 82.4\%$) of first responders and females less than twenty percent ($n = 23, 17.6\%$). There was no statistically significant difference in age between male (42.1) and female (40.4) first responders ($t = .826, df = 129, p > .10$). The majority of the participants at the WCPR fell within the Law Enforcement group ($n=95, 72.5\%$), while a smaller proportion fell in the Fire Personnel & Others group ($n=36, 27.5\%$). The overall baseline (pre-intervention) mean, grouped by demographic categorization (age, occupation and gender) was 70.46. And, as a rule of practice with the SCL-90-R, T-scores above 63 suggest the presence of a clinically significant level of psychological difficulties (Groth-Marnat, 2003). The post-intervention score, grouped by the same demographic categorization, was 55.55 – a decrease in scores of 14.91. This decrease of nearly 15 points suggests that on the average the participants' scores decreased from a significant level of psychological difficulties (considered to be “clinical” in nature) to a Normative (within Normal) range. The Hostility (HOS) subscale decreased the most, by nearly 18 points (17.85) and Phobic Anxiety (PHOB) subscale decreased the least with nearly 11 points (10.61).

On average, between baseline and post-intervention, the younger cohorts' (age 24-40 years of age) mean (Table 2) score decreased a little more (15.86) than the older group (14.06 for participants over 40 years of age). At baseline, younger first responders

(70.92) had generally higher scores (except on Somatization [SOM] and Paranoid Ideation [PAR]) than the older group (70.05); but, differences were small – the largest one occurring on HOS (5.9). At post-intervention, the younger group had, on average, a lower score (55.06) than the older group (55.98); but, once again, the differences were small – the largest one occurring on PAR (3.42).

Law enforcement first responders' scores, on average, between baseline and post-intervention declined slightly less (14.84) than the Fire Personnel & Others group of first responders (15.09); but, the differences were small (Table 3). Law enforcement first responders had slightly lower baseline scores (70.19) than other first responders (71.17). This was also the case for post-intervention score (55.35 and 56.08, respectively). The results suggest that the intervention is nearly equally effective for law enforcement personnel as it is for the fire fighters and associated personnel. For both occupations, the respective pre-intervention scores were in the clinical range, while the post-intervention results suggest that the symptom levels decreased to a Normative level.

Male first responders, on average, had a slightly higher decrease (15.06) in mean score between baseline and post-intervention than did female first responders (14.21, Table 4). Male responders had a slightly higher mean score (70.98) at baseline than female responders (60.04); such was the case after the intervention – 55.91 and 53.83, respectively. Differences between male and female mean scores were always less than 3 points – 2.98 at baseline and 2.40 after the intervention. And, once again, the symptom levels dropped from a clinical range to a Normative range.

The line graph (Figure 4) illustrates that Positive Symptom Distress Index (PSDI) was the scale with the largest percentage of participants (95.4%) whose scores decreased at post-intervention, compared to their baseline scores. PHOB was the scale that had the smallest percentage of participants (80.1%) whose scores decreased at post-intervention compared to baseline. The Global Severity Index's (GSI) baseline (pre-intervention) mean was 75.41 and the post-intervention score was 57.70 – a decrease of 17.71. This decrease supports the research hypothesis (Hypothesis 1), which predicted a decrease in this index. Due to the fact that the GSI is an index that is a combined rating designed to take into account the intensity of experienced stress along with the number of reported symptoms, this decrease suggests that the Retreat's multimodal treatment approach was effective in reducing these factors to a level that falls below that of a clinical level of psychological distress. Similarly, the Positive Symptom Distress Index's (designed to measure the intensity of symptoms) baseline mean was 69.27 and the post-intervention score was 53.49 – a decrease of 15.78. This decrease supports the research hypothesis (Hypothesis 2), which predicted a decrease in this index. Because the PSDI is designed to measure the intensity of symptoms, this decrease in scores suggests that the intervention was successful in lowering the levels of symptom intensity to a level that does not suggest a significant clinical level of psychological distress.

The Positive Symptom Total index's baseline mean was 70.16 and the post-intervention score was 57.35 – a decrease of 12.81. Whereas the PSDI is a measure of symptom severity, PST represents the number (or breadth) of symptoms. Thus, a participant could theoretically have a low PSDI, indicating that the symptoms they had

were not particularly troubling, but might have a high PST indicating that they had a wide, potentially complex, array of symptoms (Groth-Marnat, 2003). The results of the testing suggest that, with the decrease in both the PSDI and the PST, the participants experienced a reduction in both the severity *and* the number of symptoms that they had reported upon entering the treatment program. This decrease supports the research hypothesis (Hypothesis 3), which predicted a decrease in this index.

The West Coast Post-trauma Retreat's multimodal treatment program appears to have the greatest effect (symptom-score reduction) in younger (age 24-40 years of age) males in the Fire Personnel & Others group. However, the differences between the pre- and post-intervention comparisons were very slight across and among all demographics (gender, age, and occupation). Participants, regardless of occupation, age, or gender, reported that their overall symptom severity and breadth decreased significantly by the end of the Retreat. Each of the nine symptoms and the three indices, on average, decreased from a significant clinical level of psychological distress to within the Normative range.

Recommendations for Future Research

Based on the results of this study, it appears that the West Coast Post-trauma Retreat is currently succeeding in effectively treating first responders. The

symptoms of the participants are successfully being decreased from a significant clinical level of psychological distress to a range that falls within the Normal or Normative range. These results are very encouraging and suggest that first responders would benefit from attending this treatment program. This study, however, should by no means be considered a complete or definitive conclusion to the measuring of the Retreat's efficacy. There are a number of different and logical directions for future research that may want to be considered or undertaken.

One direction that might be of interest could include a longitudinal study and analysis. It would be valuable to explore the reported levels of symptoms after various time periods. This could provide some insight into how well the participants are faring after these periods of time and how effective the intervention is after these increments. It would be worthwhile to study the effects that time had on the individual (nine) symptom subscales and the (three) indices on the Symptom Checklist-90-Revised.

It could be useful to perform a similar assessment of the West Coast Post-trauma Retreat by utilizing an instrument other than the Symptom Checklist-90-Revised. The results could be compared to this study and relevance and correlations to the intervention program could then be made. Ideally, it would be beneficial to utilize an instrument that is not based on self-reporting, as is the Symptom Checklist-90-Revised. Although the Symptom Checklist-90-Revised instrument's items are considered to be reliable and valid and it benefits from some of the advantages that go along with self-report instruments, there are inherent disadvantages and shortcomings with it and other self-reporting tests.

Some of the disadvantages include: answers that may be exaggerated; levels of untruth (due to embarrassment or denial on the respondent's part) may be present; memory issues may affect the responses and the results could be biased by the individual's feelings at the time of the examination or by biases like the Social Desirability Bias (the tendency of examinees to answer questions in a manner that will be viewed favorably by the examiner or others).

Another possible direction for future research might involve testing and analyzing *each* therapeutic component at the Retreat and *each* of the clinicians participating in the various treatment modalities there. By assessing these specific modalities and clinicians, it would be possible to identify the most effective treatment modalities and the most effective contributing clinicians. The Retreat could then adjust its program and include only the most effective components and clinicians. This would help to maximize the Retreat's effectiveness and would provide the greatest service to the first responders who attend the program.

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Appendix A

Phone Intake Interview

Appendix B

Peer Intake Interview

Appendix C

Definition of Terms

Measures of Central Tendency:

The **Mean**: the arithmetic average – the sum of all values of the variable divided by the number (N=40) of values.

The **95% confidence interval** for the mean: the interval within which the true (population) mean should be located – we are 95% confident that the true value (population parameter) lies within upper and lower bounds of the interval. The confidence interval consists of two elements: 1) the margin of error – which tells us how close our estimate is to the population parameter; and, 2) the level of confidence – a probability statement, which denotes the proportion of sample intervals and would include the population parameter. The validity of this interval is measured by the confidence level (95%, 90%, etc.) and its precision by its width.

The **5% Trimmed Mean**: the mean for the central 90 percent of the distribution – 5 percent of the values at the low end of the scale are disregarded, as well as the top 5 percent.

The **Median**: the value that splits the univariate distribution into equal halves. Half of the data points are above this value and the other half are below. The median is also the second quartile or the 50th percentile.

Measures of Dispersion (Variability)

The **Variance**: the average squared difference between a data point and the mean.

The **Standard Deviation**: is the square root of the variance and is the average distance of data points from the mean. The larger the standard deviation (and, therefore, the variance), the more spread out the distribution is (i.e., the farther away, on average, data points are from the mean, and thereby from one another).

The **Range**: the difference between the maximum (largest) value in the distribution and the minimum (smallest) value.

The **Interquartile Range (IQR)**: the difference between the value of the third quartile (75th percentile) and the value of the 25th percentile (1st quartile). In other words, it is the spread of the central 50 percent of the distribution.

Measures of Shape

Skewness: refers to the shape of the distribution. If the distribution is symmetric like that of the normal distribution, skewness is zero. A positive value of skewness indicates that the distribution is skewed to the right. A negative value of skewness indicates that the distribution is skewed to the left (the distribution tails off in that direction).

Kurtosis: has to do with another aspect of the shape of a distribution. A positive value of kurtosis indicates that a greater proportion of the distribution is in the tails than would be

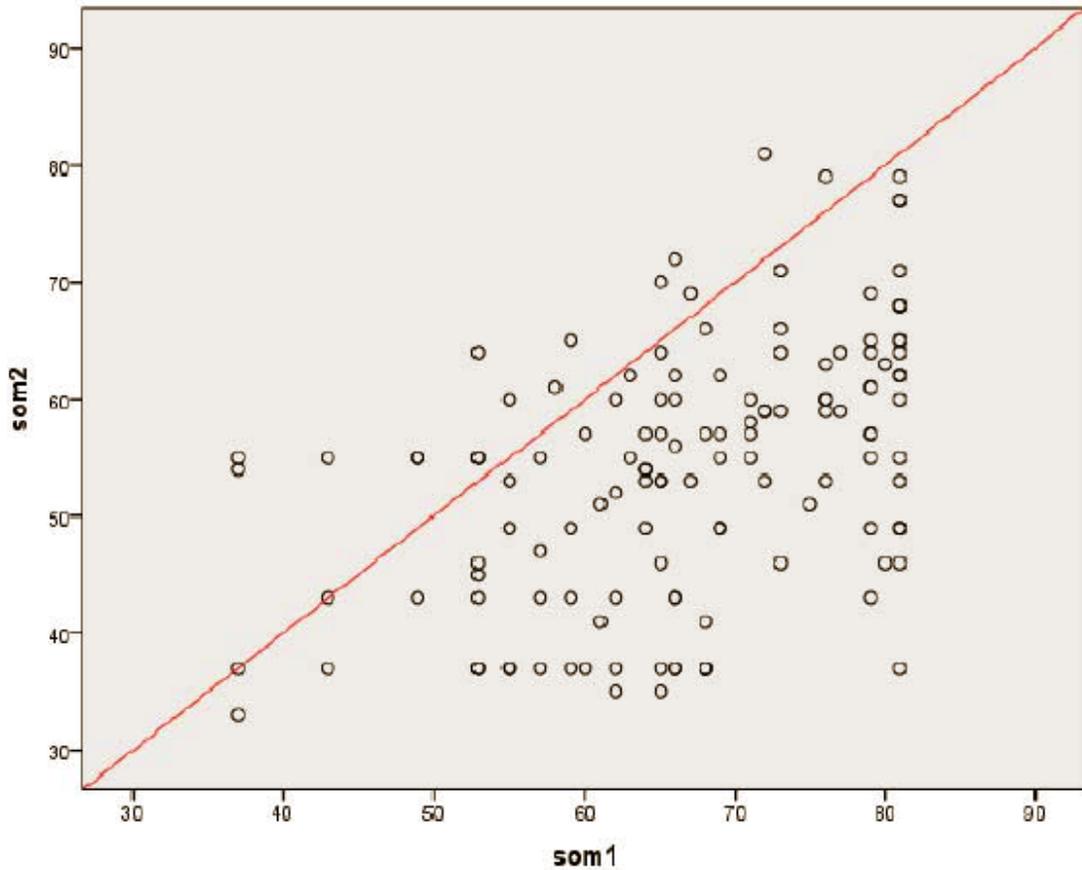
the case for a normal distribution. A negative value tells us that the distribution is more peaked than a normal distribution.

The **standard error**: the standard deviation of the sampling distribution of a given statistic. Under standard statistical theory, if we take repeated samples of size N from some population and calculate a given statistic for each sample, the sample statistic has a distribution and a given standard deviation – referred to as the standard error.

Appendix D

Scatter Plots and Somatization Scale

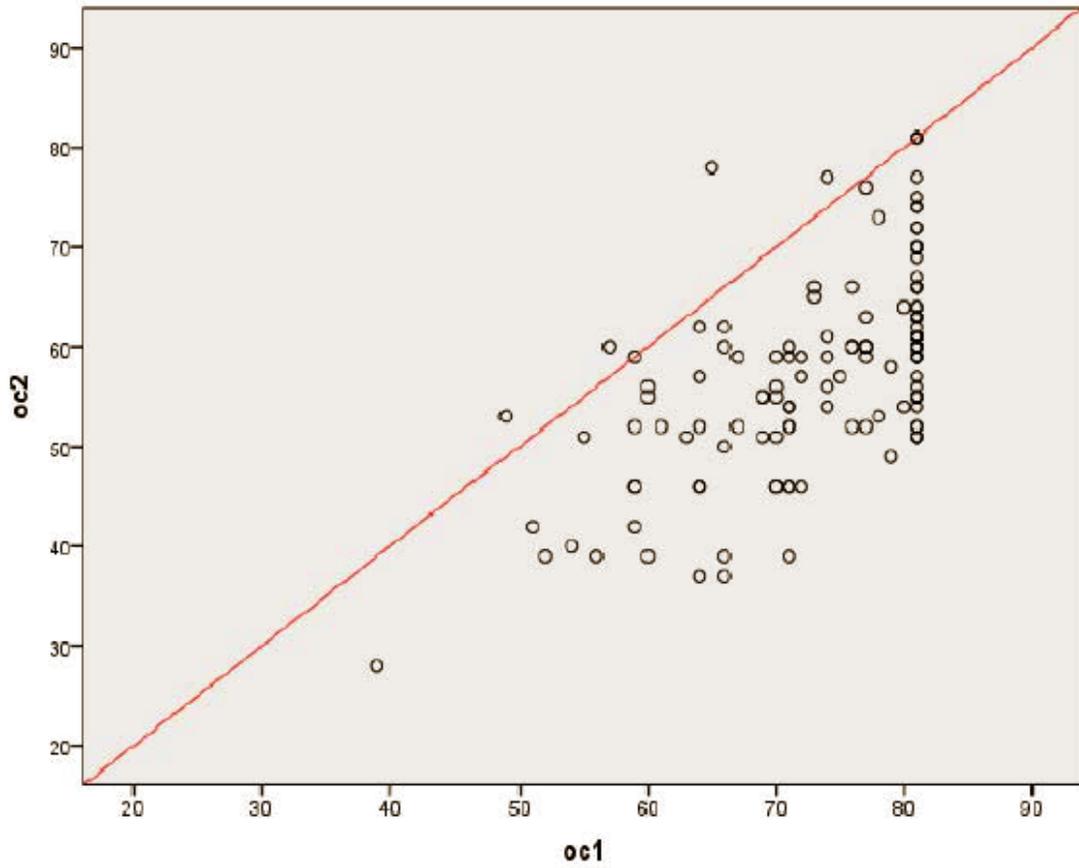
The following scatter plots show what happened to scores before and after intervention on all nine symptom scales and all three global indices. Each point in the plot represents a participant (assuming no overlap – when two participants having the same scores). The baseline score is plotted on the horizontal axis and the post-intervention score is plotted on the vertical axis. The red diagonal line in each graph is the line of no change; as in, a participant is on the line if he or she has the same score both times, at baseline and after intervention. Participants who are below the line are those whose score on post-intervention is lower than at baseline and the reverse for participants above the line – their scores have increased compared to baseline. The graphs for all the scales show that most of the points are below the diagonal line – indicating that most participants had a lower score on post-intervention.



SOMATIZATION (SOM) SCALE

Appendix E

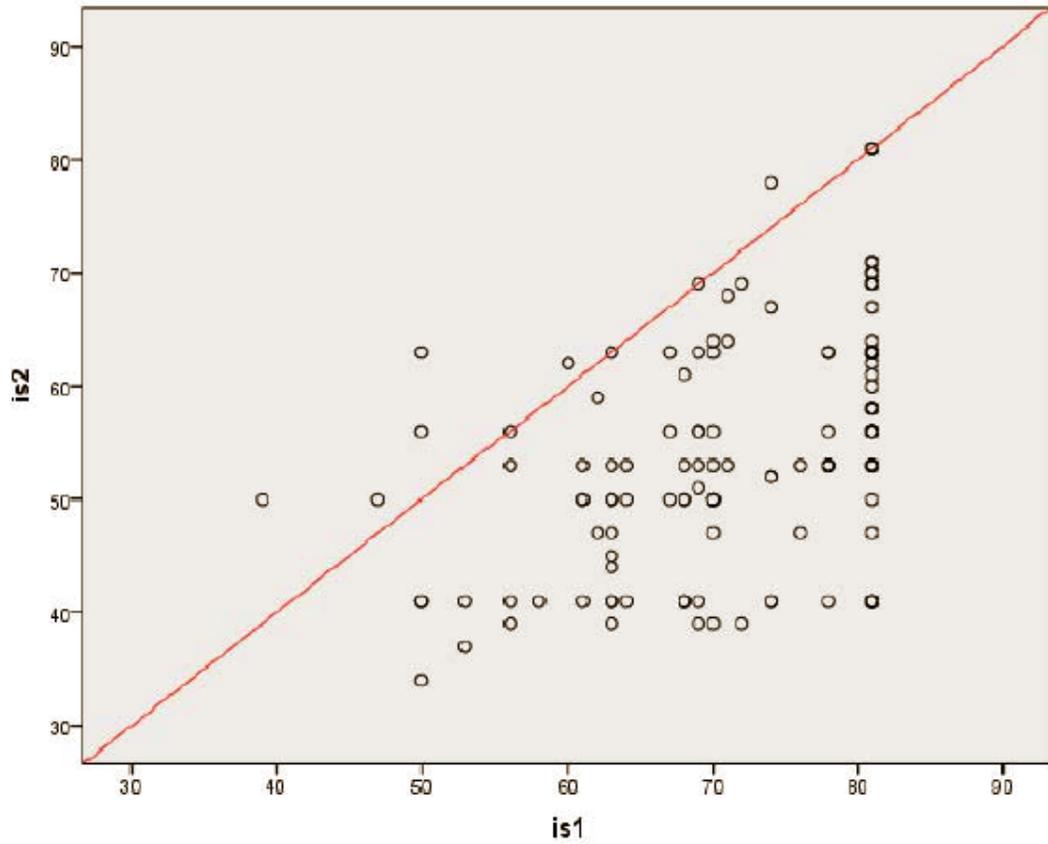
Obsessive-Compulsive Scale



OBSESSIVE-COMPULSIVE (O-C) SCALE

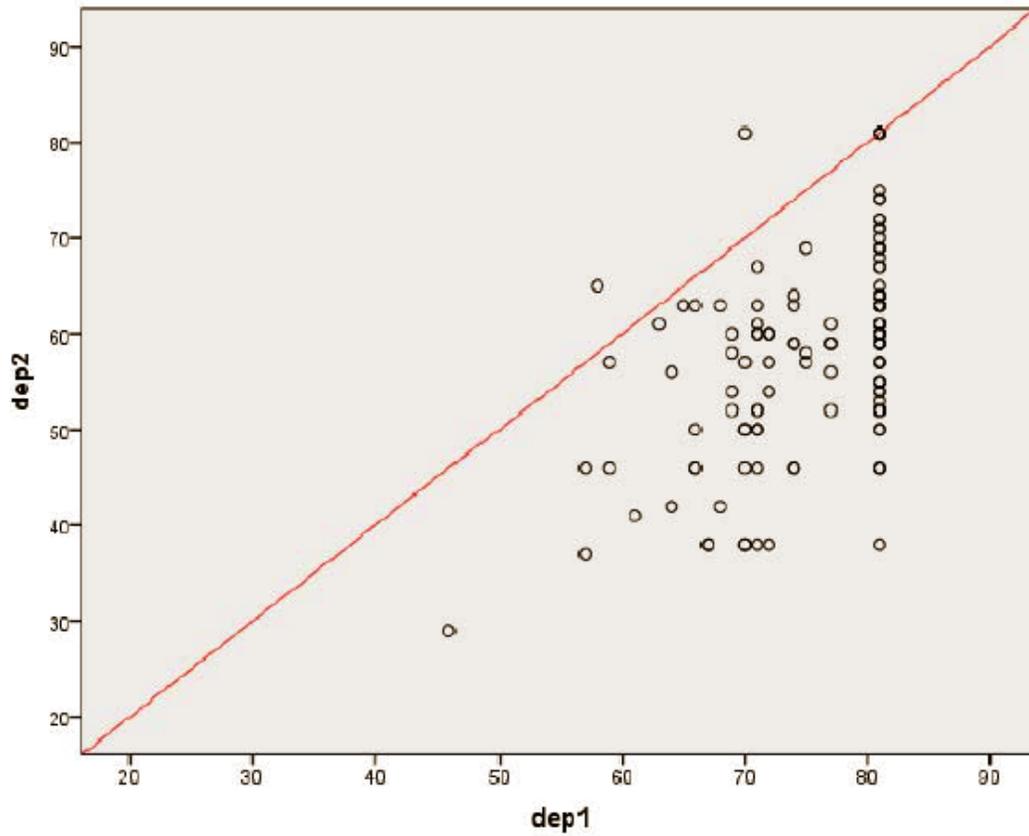
Appendix F

Interpersonal-Sensitivity Scale



INTERPERSONAL-SENSITIVITY (I-S) SCALE

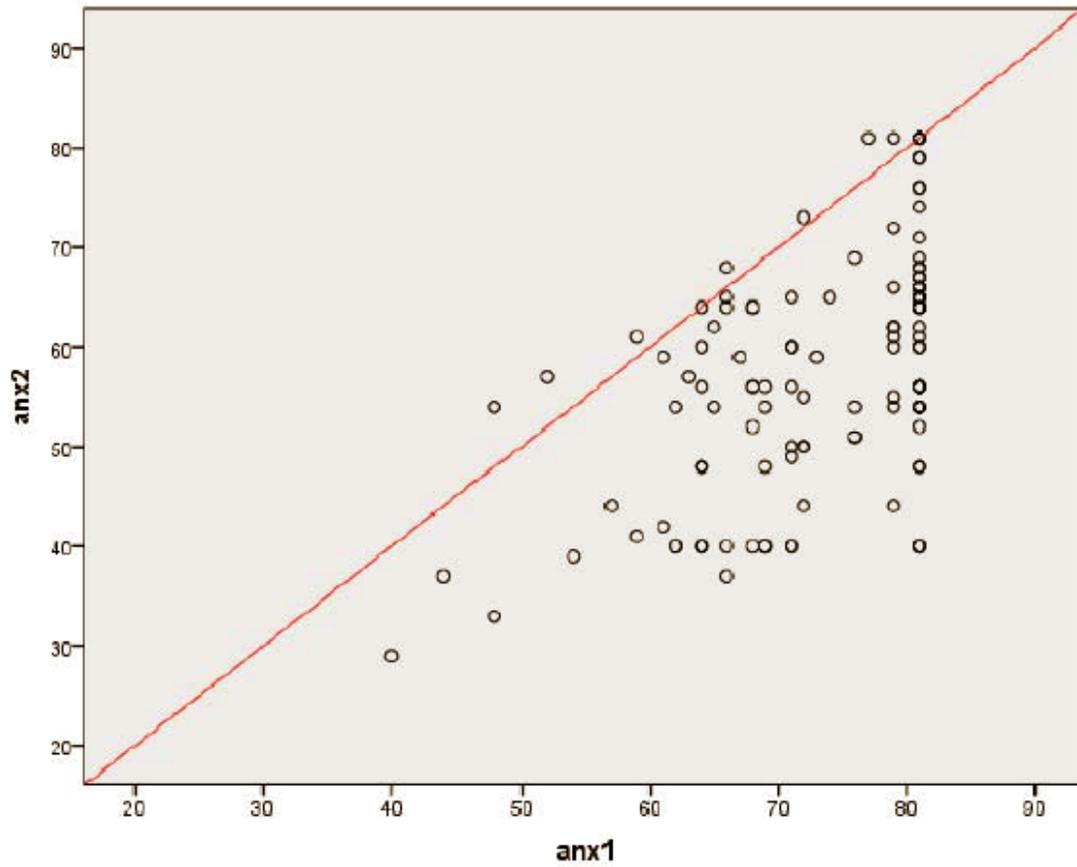
Appendix G
Depression Scale



DEPRESSION (DEP) SCALE

Appendix H

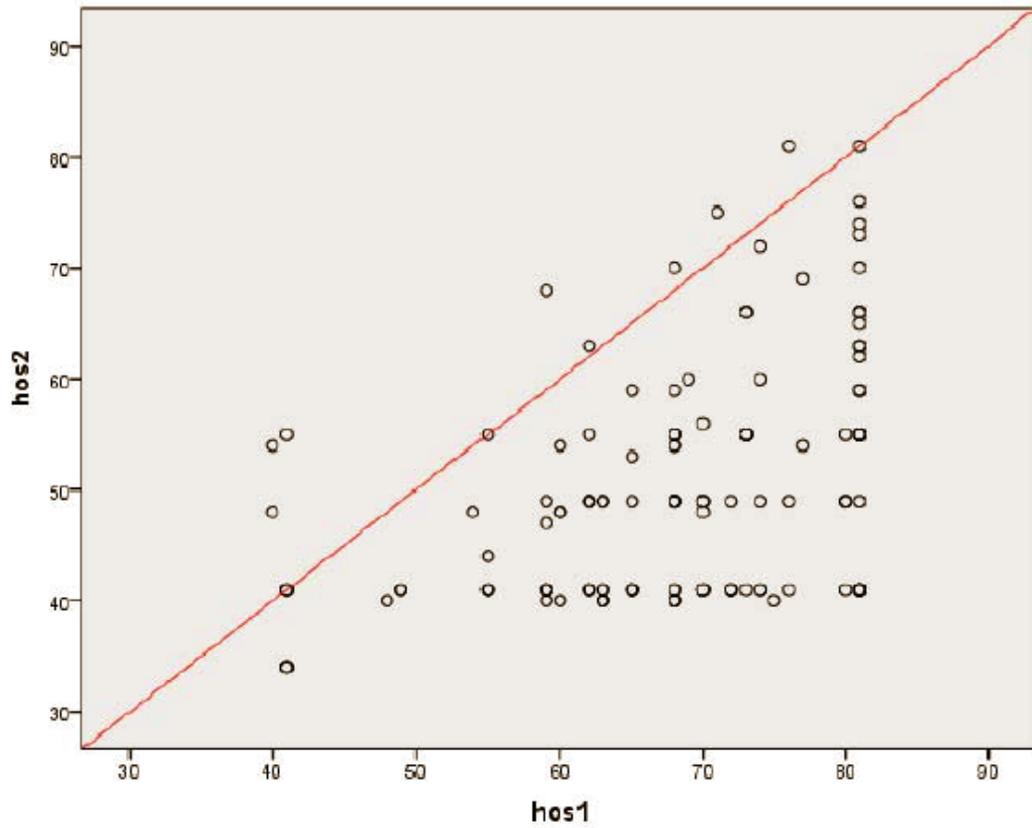
Anxiety Scale



ANXIETY (ANX) SCALE

Appendix I

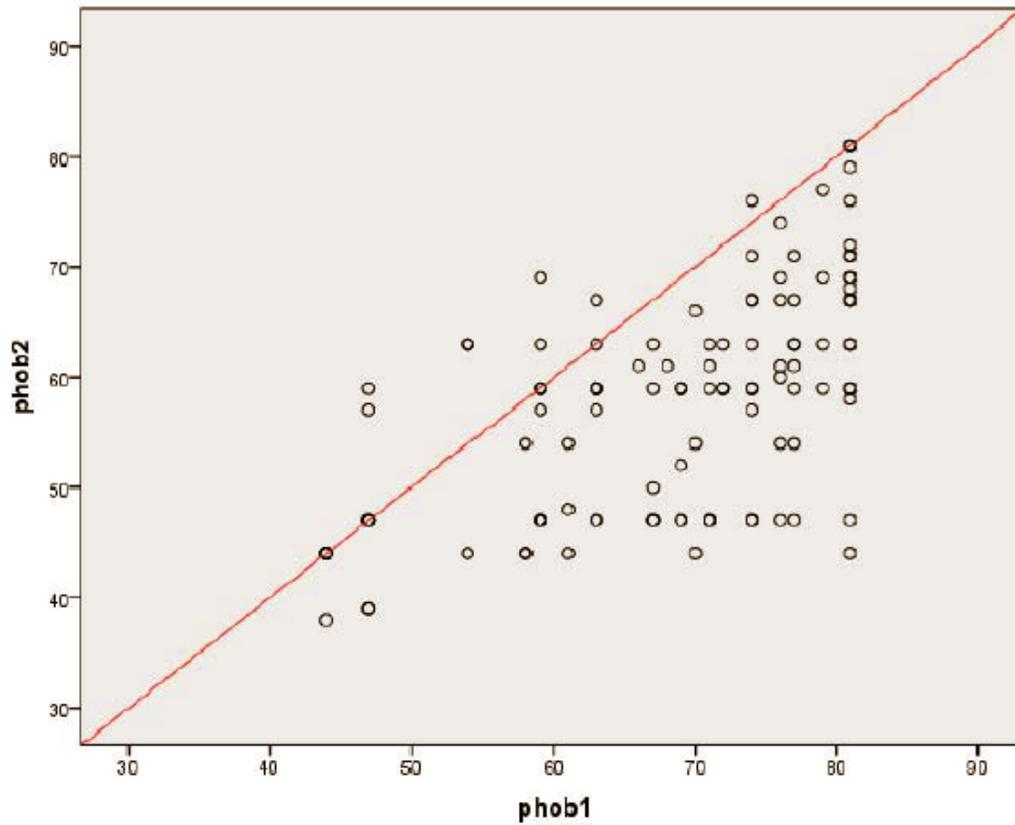
Hostility Scale



HOSTILITY (HOS) SCALE

Appendix J

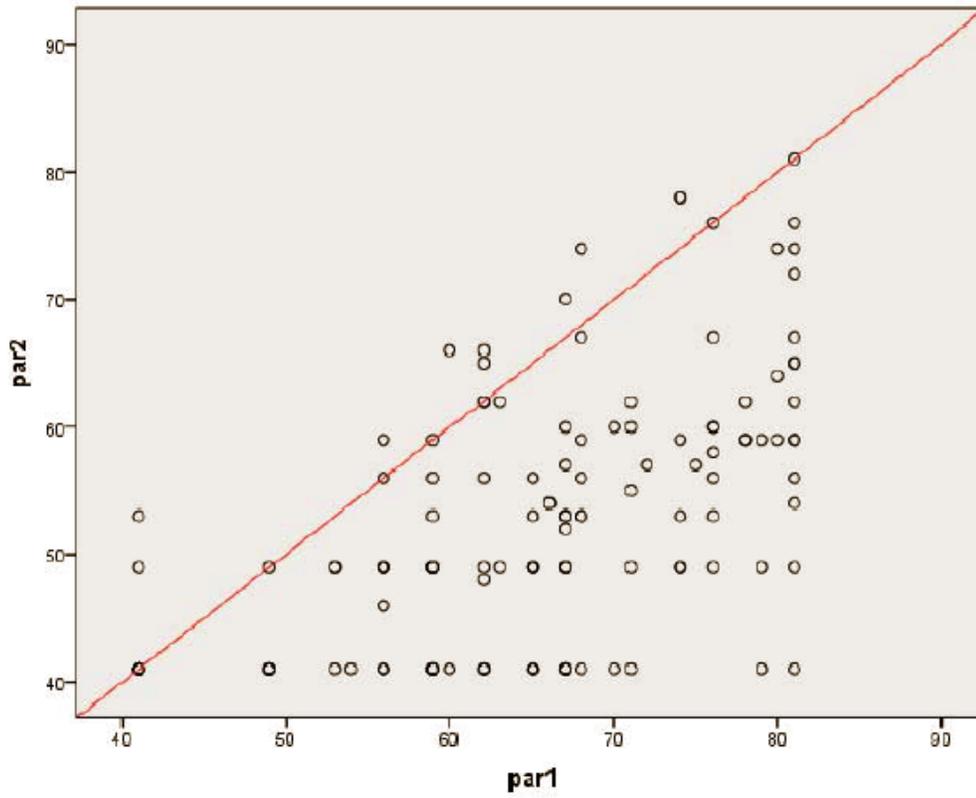
Phobic Anxiety Scale



PHOBIC ANXIETY (PHOB) SCALE

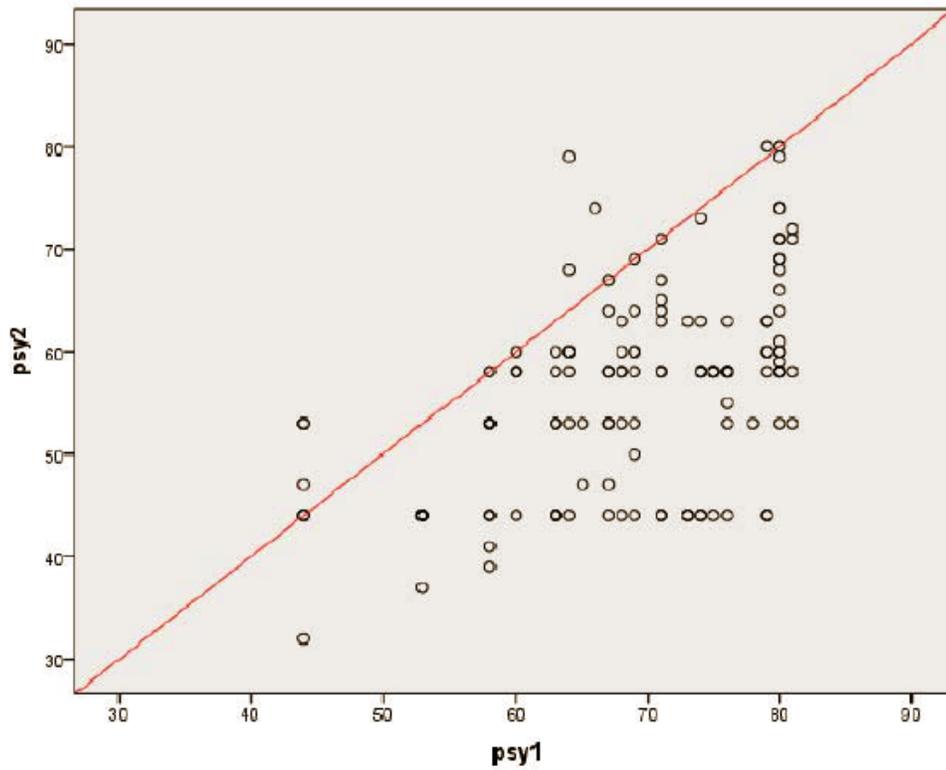
Appendix K

Paranoid Ideation Scale



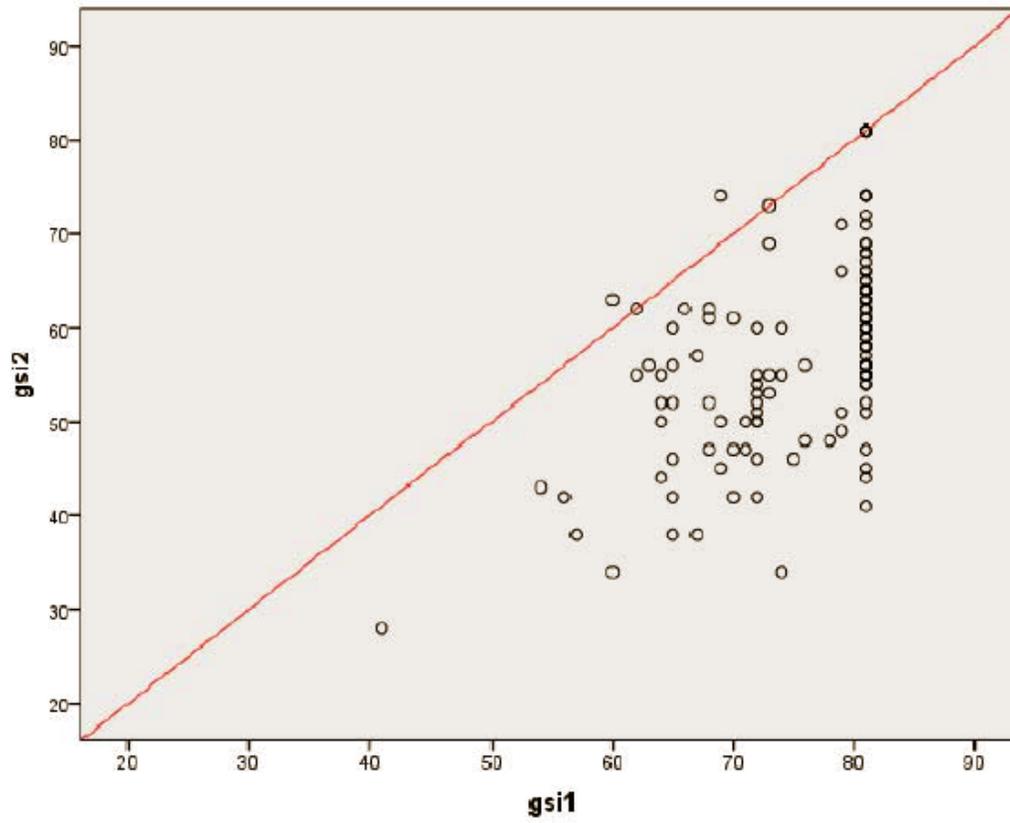
PARANOID IDEATION (PAR) SCALE

Appendix L
Psychoticism Scale



PSYCHOTICISM (PSY) SCALE

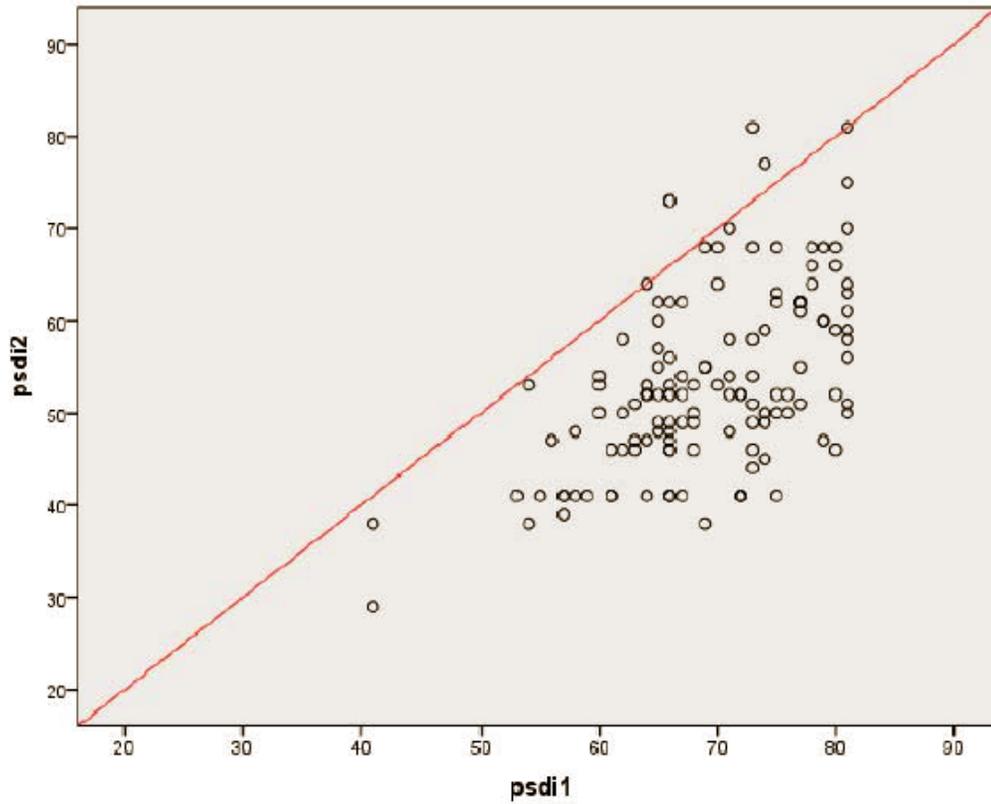
Appendix M
Global Severity Index



GLOBAL SEVERITY INDEX (GSI)

Appendix N

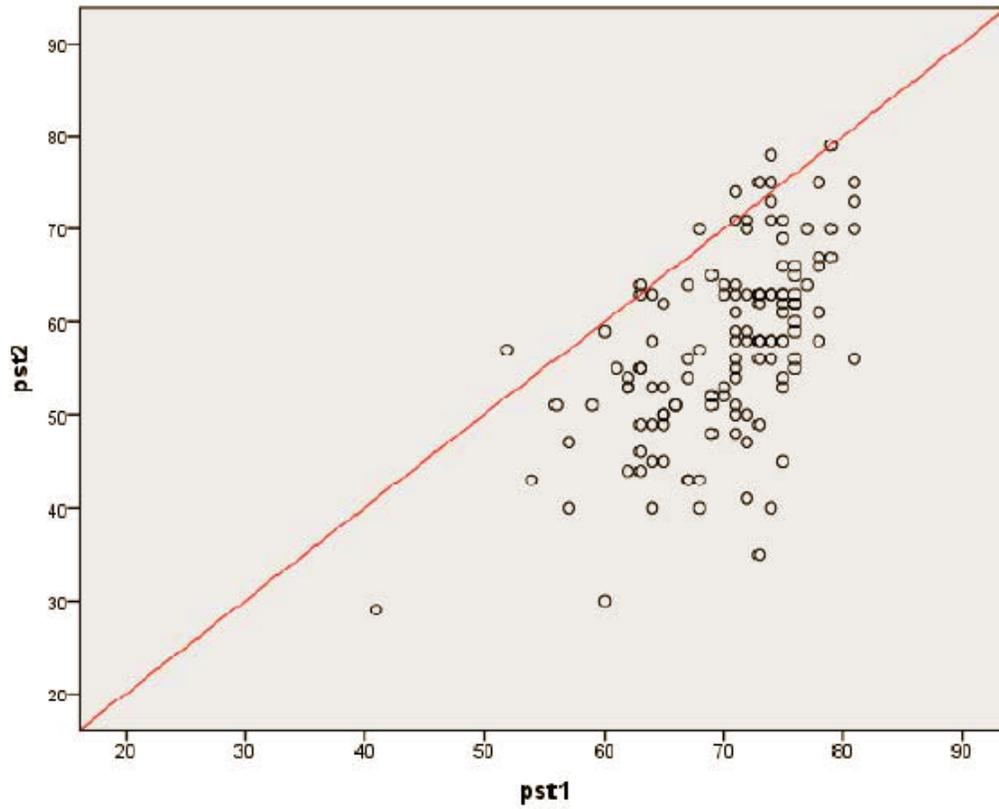
Positive Symptom Distress Index



POSITIVE SYMPTOM DISTRESS INDEX (PSDI)

Appendix O

Positive Symptom Total Index



POSITIVE SYMPTOM TOTAL (PST)

Appendix P

Pre- and Post-intervention Comparisons for Subscales and Indices

The following set of tables provides statistics, pre- and post-intervention, for all nine symptom scales and for all three global indices. The Somatization subscale is presented first.

Descriptives

			som1	som2	
Statistic	Mean		66.82	54.00	
	95% Confidence Interval for Mean	Lower Bound	64.89	52.09	
		Upper Bound	68.76	55.91	
	5% Trimmed Mean		67.56	53.74	
	Median		67.00	55.00	
	Variance		125.838	122.569	
	Std. Deviation		11.218	11.071	
	Minimum		37	33	
	Maximum		81	81	
	Range		44	48	
	Interquartile Range		17	16	
	Skewness		-.638	.028	
	Kurtosis		-.008	-.529	
	Std. Error	Mean		.980	.967
		Skewness		.212	.212
Kurtosis			.420	.420	

Descriptives - Somatization Scale

Appendix Q

Descriptives – Obsessive-Compulsive Scale and Interpersonal-Sensitivity Scale

Descriptives

			oc1	oc2	
Statistic	Mean		73.37	57.76	
	95% Confidence Interval for Mean	Lower Bound	71.83	56.02	
		Upper Bound	74.92	59.50	
	5% Trimmed Mean		74.22	57.72	
	Median		77.00	59.00	
	Variance		80.190	101.428	
	Std. Deviation		8.955	10.071	
	Minimum		39	28	
	Maximum		81	81	
	Range		42	53	
	Interquartile Range		12	11	
	Skewness		-1.169	.027	
	Kurtosis		.979	.389	
	Std. Error	Mean		.782	.880
		Skewness		.212	.212
Kurtosis			.420	.420	

Descriptives

			is1	is2	
Statistic	Mean		71.51	54.21	
	95% Confidence Interval for Mean	Lower Bound	69.82	52.41	
		Upper Bound	73.20	56.02	
	5% Trimmed Mean		72.30	53.88	
	Median		72.00	53.00	
	Variance		95.452	108.754	
	Std. Deviation		9.770	10.429	
	Minimum		39	34	
	Maximum		81	81	
	Range		42	47	
	Interquartile Range		17	16	
	Skewness		-.851	.324	
	Kurtosis		.113	-.382	
	Std. Error	Mean		.854	.911
		Skewness		.212	.212
Kurtosis			.420	.420	

Appendix R

Descriptives – Depression Scale and Anxiety Scale

Descriptives

			dep1	dep2
Statistic	Mean		75.56	58.16
	95% Confidence Interval for Mean	Lower Bound	74.33	56.28
		Upper Bound	76.80	60.04
	5% Trimmed Mean		76.33	58.10
	Median		81.00	59.00
	Variance		50.786	118.243
	Std. Deviation		7.126	10.874
	Minimum		46	29
	Maximum		81	81
	Range		35	52
	Interquartile Range		10	11
	Skewness		-1.302	.064
	Kurtosis		1.608	.096
	Std. Error	Mean		.623
Skewness			.212	.212
Kurtosis			.420	.420

Descriptives

			anx1	anx2
Statistic	Mean		73.56	57.82
	95% Confidence Interval for Mean	Lower Bound	71.99	55.76
		Upper Bound	75.14	59.89
	5% Trimmed Mean		74.55	57.74
	Median		79.00	59.00
	Variance		83.109	143.192
	Std. Deviation		9.116	11.966
	Minimum		40	29
	Maximum		81	81
	Range		41	52
	Interquartile Range		13	15
	Skewness		-1.258	-.059
	Kurtosis		1.388	-.446
	Std. Error	Mean		.797
Skewness			.212	.212
Kurtosis			.420	.420

Appendix S

Descriptives – Hostility Scale and Phobic Anxiety Scale

Descriptives

			hos1	hos2
Statistic	Mean		67.66	49.81
	95% Confidence Interval for Mean	Lower Bound	65.73	47.98
		Upper Bound	69.60	51.64
	5% Trimmed Mean		68.42	49.04
	Median		68.00	49.00
	Variance		124.917	111.940
	Std. Deviation		11.177	10.580
	Minimum		40	34
	Maximum		81	81
	Range		41	47
	Interquartile Range		15	14
	Skewness		-.781	.976
	Kurtosis		.198	.313
	Std. Error	Mean		.977
Skewness			.212	.212
Kurtosis			.420	.420

Descriptives

			phob1	phob2
Statistic	Mean		68.07	57.46
	95% Confidence Interval for Mean	Lower Bound	66.17	55.69
		Upper Bound	69.97	59.23
	5% Trimmed Mean		68.62	57.11
	Median		71.00	59.00
	Variance		120.895	104.881
	Std. Deviation		10.995	10.241
	Minimum		44	38
	Maximum		81	81
	Range		37	43
	Interquartile Range		18	16
	Skewness		-.663	.293
	Kurtosis		-.544	-.617
	Std. Error	Mean		.961
Skewness			.212	.212
Kurtosis			.420	.420

Appendix T

Descriptives – Paranoid Ideation Scale and Psychoticism Scale

Descriptives

		par1	par2	
Statistic	Mean	65.42	52.70	
	95% Confidence Interval for Mean	Lower Bound	63.51	50.93
		Upper Bound	67.32	54.48
	5% Trimmed Mean	65.91	52.01	
	Median	67.00	52.00	
	Variance	121.461	105.488	
	Std. Deviation	11.021	10.271	
	Minimum	41	41	
	Maximum	81	81	
	Range	40	40	
	Interquartile Range	15	18	
	Skewness	-.491	.645	
	Kurtosis	-.287	-.200	
	Std. Error	Mean	.963	.897
Skewness		.212	.212	
Kurtosis		.420	.420	

Descriptives

		psy1	psy2	
Statistic	Mean	68.67	56.10	
	95% Confidence Interval for Mean	Lower Bound	66.99	54.37
		Upper Bound	70.35	57.83
	5% Trimmed Mean	69.34	55.82	
	Median	69.00	58.00	
	Variance	94.730	99.921	
	Std. Deviation	9.733	9.996	
	Minimum	44	32	
	Maximum	81	80	
	Range	37	48	
	Interquartile Range	13	19	
	Skewness	-.733	.191	
	Kurtosis	-.020	-.383	
	Std. Error	Mean	.850	.873
Skewness		.212	.212	
Kurtosis		.420	.420	

Appendix U

Descriptives – Global Severity Index and Positive Symptom Distress Index

Descriptives

		gsi1	gsi2	
Statistic	Mean	75.41	57.70	
	95% Confidence Interval for Mean	Lower Bound	74.08	55.84
		Upper Bound	76.74	59.56
	5% Trimmed Mean	76.22	57.64	
	Median	81.00	57.00	
	Variance	59.013	115.949	
	Std. Deviation	7.682	10.768	
	Minimum	41	28	
	Maximum	81	81	
	Range	40	53	
	Interquartile Range	10	13	
	Skewness	-1.442	.108	
	Kurtosis	2.296	.182	
	Std. Error	Mean	.671	.941
Skewness		.212	.212	
Kurtosis		.420	.420	

Descriptives

		psdi1	psdi2	
Statistic	Mean	69.27	53.49	
	95% Confidence Interval for Mean	Lower Bound	67.88	51.78
		Upper Bound	70.67	55.19
	5% Trimmed Mean	69.68	53.12	
	Median	69.00	52.00	
	Variance	65.032	97.359	
	Std. Deviation	8.064	9.867	
	Minimum	41	29	
	Maximum	81	81	
	Range	40	52	
	Interquartile Range	10	14	
	Skewness	-.655	.471	
	Kurtosis	.868	.016	
	Std. Error	Mean	.705	.862
Skewness		.212	.212	
Kurtosis		.420	.420	

Appendix V

Descriptives - Positive Symptom Total Index

Descriptives

		pst1	pst2	
Statistic	Mean	70.16	57.35	
	95% Confidence Interval for Mean	Lower Bound	69.03	55.65
		Upper Bound	71.29	59.06
	5% Trimmed Mean	70.54	57.50	
	Median	71.00	58.00	
	Variance	42.505	97.260	
	Std. Deviation	6.520	9.862	
	Minimum	41	29	
	Maximum	81	79	
	Range	40	50	
	Interquartile Range	10	12	
	Skewness	-1.115	-.241	
	Kurtosis	2.335	.023	
Std. Error	Mean	.570	.862	
	Skewness	.212	.212	
	Kurtosis	.420	.420	