

The Effect of a Modified Classic Herbal Formula, Bupleurum and Dragon Bone (*Chai Hu Long Gu Mu Li Tang Jia Jian*), on Stress: A Small Sample Non-Randomized Clinical Trial

by

George J. Lamoureux, L.Ac., M.A.T.C.M., Dipl. Ac. NCCAOM

A Capstone Project

Presented in partial fulfillment of the requirements for the

Doctor of Acupuncture and Oriental Medicine Degree

Capstone Project Advisor: Lawrence J. Ryan, Ph. D.

Yo San University

Los Angeles, California

April 2014

Approval Signature Page

This Capstone Project has been reviewed and approved by:



8/29/2014

Lawrence J. Ryan, Ph. D., Capstone Project Advisor

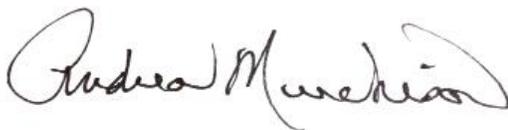
Date



8/29/2014

Don Lee, L. Ac., Specialty Chair

Date



8/29/2014

Andrea Murchison, D.A.O.M., L. Ac., Program Director

Date

Abstract

Contemporary society has seen stress reaching epidemic proportions. Pharmaceutical drugs, although effective, run the risk of physical dependence and addiction, prompting stress sufferers to seek other therapies. Chinese medicine, and in particular herbal medicine, presents a reasonable and effective treatment for stress management. Human clinical trials of Chinese herbal formulas are sorely lacking in Western medical literature. This present small sample, non-randomized clinical trial was conducted to test the efficacy of the herbal formula *Bupleurum and Dargon Bone (Chai Hu Long Gu Mu Li Tang Jia Jian)* in lowering participant scores on the standardized Perceived Stress Scale. The result of this clinical trial yielded a highly significant p-value of .001. The statistical results were discussed in terms of theory and practice. Limitations of this trial were discussed and recommendations for future research proposed.

Acknowledgments

This capstone project was completed during the 25th anniversary of Yo San University, so it is with a grateful heart that I acknowledge the Ni family for their vision in founding this enduring institution. A special thanks is extended to Drs. Daoshing and Mao Shing Ni for their unending dedication in guiding our university since its founding. This project may never have been completed on time without the kindness, generosity and expertise of my capstone advisor Dr. Larry Ryan who gave of his time while also fulfilling his duties as President of Yo San University. To Dr. Andrea Murchison who assumed the position of DAOM Program Director; thank you for showing us how leadership is executed with authority, grace, and humor. To my fellow DAOM classmates, I could never have completed this program without your kind support and encouragement, each and every one of you taught me how to be a better person. And lastly, but always first in my heart; thank you DCF for being by my side not only through this, but through thirty four years of life.

Table of Contents

Signature Page.....	2
Abstract.....	3
Acknowledgements.....	4
Chapter One: Introduction	8
Purpose.....	10
Research Question	10
Hypothesis.....	10
Null Hypothesis	10
Value of the Study	10
Definition of Terms.....	11
Chapter Two: Literature Review	13
Overview.....	13
Stress.....	13
Brief History of Stress Theory	14
Bupleurum Presentation and Constitution	20
Bupleurum and Dragon Bone (Chai Hu Long Gu Mu Li Tang Jia Jian).....	22
Literature Review Integration.....	24
Chapter Three: Method.....	26
Design	26
The Bupleurum and Dragon Bone Formula.....	26
Human Subjects Ethical Considerations.....	28
Sample.....	28
Instruments.....	29
Data Collection Procedures.....	31
Data Analysis	34
Chapter Four: Results	39
Data Overview.....	39
Univariate Descriptive Results	39
Age.....	39
Gender.....	41

Ethnicity	42
Education	42
Military Service	43
Occupation	44
Marital Status	45
Household Income	45
Perceived Stress Scale Scores	47
Summary Statistics for Perceived Stress Scale	49
Significance of Score Decrease	50
Chapter Five: Discussion	52
Implications for Theory	52
Implications For Practitioners	53
Limitations of Current Study	54
Recommendations for Future Research	54
Conclusions	55
References	57

List of Tables

Table 1: Designation of Instrument and Data Description	34
Table 2: Pre-Intervention PSS Scores	37
Table 3: Participant Age	40
Table 4: Age Groups	40
Table 5: ANOVA	41
Table 6: Gender	41
Table 7: Ethnicity	42
Table 8: Education	43
Table 9: Military Service	43
Table 10: Occupation	44

Table 11: Marital Status.....	45
Table 12: Income.....	46
Table 13: ANOVA for Income Groups.....	47
Table 14: Perceived Stress Scale Scores.....	48
Table 15: Net Score Change.....	49
Table 16: Summary Statistics for PSS.....	50
Table 17: Statistical Significance of Score Decrease.....	52

Appendices

Appendix A: Text of Advertisement.....	61
Appendix B: Pre-Screening Telephone Interview.....	63
Appendix C: Oral Presentation.....	65
Appendix D: Waiver of Liability and Hold Harmless Agreement.....	67
Appendix E: Informed Consent.....	69
Appendix F: Life Questionnaire.....	73
Appendix G: Perceived Stress Scale.....	75
Appendix H: Daily Dosing Log.....	77
Appendix I: Tongue and Pulse Diagnosis.....	79
Appendix J: Curriculum Vitae of George J. Lamoureux.....	81
Appendix K: Copy of the Institutional Review Board Approval Letter	85

Chapter One: Introduction

The World Health Organization (WHO) has declared that stress is the epidemic of the 21st century and the International Labor Organization (ILO) referred to stress as a global epidemic. According to various estimates, the cost of stress on the American economy falls somewhere between 200 and 300 billion dollars a year in lost productivity, absenteeism and illness (Smith, 2012).

It is not possible to avoid all forms of stress in our lives, nor should we want to, because they can be natural elements of survival. But, the stress of today is not the stress of our forefathers and ancestors. There was a time in the evolutionary history of the human species when the stress response was triggered more often by the threat of real physical harm by predatory animals or hostile enemies, in those scenarios, the “fight or flight” response developed and proved to be a life-saving mechanism.

We have progressed from a hunter-gatherer and agrarian society that followed the natural rhythms of the seasons, to an industrial society where our contact with nature was replaced with machinery, and now to a technological society where we are ‘wired’ 24/7. In our attempt to create a society of convenience and efficiency, our collective ingenuity has resulted in a demanding environment that assaults our very being. We are now confronted with stress as a ‘perceived’ psychological threat from which there is no escape. The fight-or-flight response that served human beings for so long has become, itself, a threat to our survival. Stress has evolved from the real to the perceived.

The pharmaceutical industry was one of the first to address the impact of the stress epidemic as early as 1954 with the discovery of benzodiazepines by Leo Sternbach. This class of drugs that contain common names such as Xanax, Valium, Klonopin, Ativan and Tessalon, first entered the market in the 1960's and gained wide acceptance from physicians and the general population. By the mid-1970s an astounding 8000 tons of these medications were sold every year (Vogel-Ciernia, A., Scarski, M. & Stout, D., n.d.). As an indication of the extent that patients were seeking help for stress and anxiety, IMS Institute for Healthcare Informatics (2010), listed benzodiazepines as number ten on the list of most commonly prescribed drugs beginning in 2005 with 76.7 million prescriptions and maintaining that position through 2009 when an amazing 87.9 million prescriptions were counted. The use of these medications is not without cost and the potential for physical and/or psychological addiction has been observed. It is the opinion of some researchers that the extensive prescribing of this class of drugs constitutes medically sanctioned addiction that will impact healthcare both economically and qualitatively (Hallfors & Saxe, 1993).

The risk of side effects and/or addiction of many psychotropic drugs on the market are causing more and more people to seek complementary and alternative medicine (CAM) to help reduce and manage the perceived stress in their lives. Within the broad category of CAM, Classical Chinese medicine, that includes acupuncture and herbal medicine, has become a popular and widely accepted modality for the treatment of stress.

Purpose

The purpose of this clinical trial is to investigate if a one month administration of the modified herbal formula named Bupleurum and Dragon Bone (*Chai Hu Long Gu Mu Li Tang Jia Jian*), would result in the participants in the trial achieving lower scores on the Perceived Stress Scale compared with baseline scores reported before the administration of the herbal formula.

Research Question

Does the herbal formula *Bupleurum and Dragon Bone (Chai Hu Long Gu Mu Li Tang Jia Jian)* reduce stress?

Hypothesis

The administration of the herbal formula *Bupleurum and Dragon Bone (Chai Hu Long Gu Mu Li Tang Jia Jian)*, for one month, will reduce the scores achieved on the 14 item Perceived Stress Scale from pre to post administration of the herbal formula.

Null Hypothesis

There will be no change in scores achieved on the 14 item Perceived Stress Scale pre and post administration of the herbal formula *Bupleurum and Dragon Bone (Chai Hu Long Gu Mu Li Tang Jia Jian)*

Value of Study

This clinical trial was conducted is to fill a gap in research not being conducted in the United States on herbal formulas that are commonly used in the clinics and private practices of Chinese medical practitioners. Both China and Japan have conducted animal and human research on herbal formulas, but to date, research from the United States is not apparent to this researcher.

More people are seeking alternatives to pharmaceutical drug therapies and their inherent side effects and potentially addictive nature. The clinical trial of this herbal formula and its effect on stress may provide a safe, effective and non-addictive alternative to healthcare practitioners both eastern and western. This trial may inspire further research under controlled and double blinded conditions to hold up to scientific scrutiny and validation.

Definition of Terms

The terms below are defined to provide a common understanding of concepts that appear repeatedly in this study.

- **Complementary and Alternative Medicine (CAM).** Therapies not usually taught in U.S. medical schools or generally available in U.S. hospitals. CAM therapies include a broad range of practices such as acupuncture, herbal remedies, and chiropractic care. They are defined by the National Center for Complementary and Alternative Medicine as a group of diverse medical and healthcare systems, practices, and products not presently considered part of conventional medicine (NCCAM, 2013).
- **Herbal Formulas.** The Chinese word for formulas or recipes is *fang ji*. *Fang* usually refers to the written recipe itself and *Ji* refers to the act of administering the recipe. These are recipes that are put into practice (Scheid, Bensky, Ellis & Barolet, 2009).
- **Pulse Diagnosis.** In Traditional Chinese medicine, the pulse is divided into three positions on each wrist. The first pulse closest to the wrist is the *cun* (inch) position, the second *guan* (gate), and the third furthest away from the wrist is the *chi* (foot). Each position represents a pair of organs, with different organs apparent on the superficial,

middle and deep level. Generally the first position on the left hand represents the heart and small intestine, the second, liver and gallbladder, and the third the kidney yin and bladder. On the right hand, the first position is representative of the lungs and large intestine, the second the spleen and stomach, and the third represents the kidney yang and uterus. The strengths and weaknesses of the positions are used to assess the patient diagnostically, along with the different qualities and rate of the pulse (Flaws, 1995).

- **Qi-** Qi is the basis for all phenomena in the universe, it can have the quality of course material form but also manifests as non-material energies (Maciocia, 2005).
- **Tongue Diagnosis** – Observation of the tongue is based on four main items: the tongue body color, the body shape, the coating and the moisture. The body color indicates the conditions of Blood, Nutritive Qi and Yin organs; it reflects conditions of Heat or Cold and Yin or Yang. The shape indicates the state of Blood and Nutritive Qi: it reflects conditions of Fullness or Deficiency. The coating indicates the condition of the Yang organs; it reflects conditions of Heat or Cold or Fullness or Deficiency. The moisture indicates the state of the Body Fluids (Maciocia, 1995).
- **Traditional Chinese Medicine (TCM).** Traditional Chinese medicine is a broad range of medicine practices sharing common concepts which have been developed in China and are based on a tradition of more than 2,000 years, including various forms of herbal medicine, acupuncture, massage, exercise and dietary therapy (Wikipedia, 2014).
- **Yin and Yang** – Basically, Yin and Yang is a concept that embraces the duality of all phenomena in the universe and arose from the observation of nature (Maciocia, 2005)

Chapter Two: Literature Review

Overview

The research information gathered for this literature review was obtained from sources such as Pubmed, Google Scholar, National Institutes of Health, Elsevier Ltd., Wiley Online, Journal of Chinese Medicine, World Health Organization, EBSCOHOST and the Louise M. Darling Biomedical Library at UCLA. Key search words included: Stress, Stress and Aging, Stress and Health, Stress and the Brain, Stress and Cardiovascular System, Stress and Immunity, Herbs for Stress, Chinese Herbs for Stress and Chinese Herbal Formulas for Stress.

This chapter will begin with a discussion of the origin of the term stress, and will cover a history of stress theory as it evolved from a physiological and psychological perspective. A definition of stress is not found in this section simply because the researcher has come to the conclusion that there is no definition that will satisfy scientists, physiologists, psychologists or many people reading this capstone. Next, there is a section that describes aspects of the Bupleurum constitution and presentation from a TCM viewpoint. The chapter proceeds with a discussion of the specific formula used in this clinical trial, and concludes with a literature review integration section that makes the case for the current study.

Stress

The term “stress,” as it pertains to psychology and emotions, is such an integral part of our modern vernacular that it seems always to have been there. But, before the term was adopted by the social sciences, it was previously employed by the physical sciences, especially engineering, to describe forces being exerted on structures such as bridges, buildings and

buttresses. We still speak of someone reaching their “breaking point” when they have reached the end of their capacity to cope with a situation, a direct throwback to engineering parlance.

Stress has been studied so thoroughly that we can now map and measure the physiological pathways by which stress impacts health and disease (Cohen, Kessler & Gordon, 1955). As Sapolsky so astutely stated, “in the parlance with which we have grown familiar, *stress can make us sick*, and there is recognition that many of the damaging diseases of slow accumulation can be either caused or made far worse by stress” (Sapolsky, 2004, p. 3). In a study conducted in 2012, it was demonstrated that high stress levels caused an accelerated shortening of telomeres and consequently cellular senescence and death (Wikgren, Maripuu, Karlsson, Nordfjall, Bergdahl, Hultdin, Del-Favero, Roos, Nilsson, Adolfsson & Norrback, 2012). This study implicates stress as a direct causal factor in the acceleration of the aging process and its impact on healthy aging and longevity.

Brief History of Stress Theory

Claude Bernard (1813-1878), a French physiologist was the first person to postulate that living organisms had an internal environment that had a direct causal relationship to their behavior (Bernard, 1865; 1961). Bernard stated that the function of the internal mechanisms however diverse they might be, have only one single function, that of maintaining a constant internal environment (Hallman, 2005). Bernard also theorized that a physical challenge to the organism had to be met with a response to counteract those challenges or threats in order to maintain balance in the internal environment, and he called this process one of *dynamic*

equilibrium. The concepts proposed by Bernard form the basis of our modern concept of stress and the organism's response to it.

Walter B. Cannon (1871-1945), an American physiologist and professor at Harvard University, expanded on the work of Bernard and discovered the physiological process of maintaining the balance of the "internal environment" in the face of external environmental changes and called it "homeostasis". He was also the first person to use the word "stress" in referencing the events that challenged or threatened the organism and the response mounted to neutralize them. He was also the first researcher to explore the connections of emotional states and their impact on physiological homeostasis. He may also have been the first scientist to suggest that emotional stress is capable of causing physiological damage to the body (Cannon, 1932). Body temperature, acidity and alkalinity balance, hormone release and blood pressure are just a few of the areas that must be maintained by homeostasis.

Hans H. B. Selye (1907-1982), is probably the most recognized figure in the study of stress and is considered the father of stress research. While conducting laboratory studies with rats, he intuited that handling the rats for injection was causing a high arousal state of the sympathetic nervous system in the animals. On post mortem examination of the animals, he also found that they all had similar physical abnormalities such as decreased size of the thymus gland, gastrointestinal ulcers and enlarged adrenal glands. Selye theorized that any organism that is exposed to a "stressor" will exhibit exactly the same response no matter what the stressor may be. He called this response the General Adaptation Syndrome. Selye divided the syndrome into three stages, the first is the "alarm reaction" when the organism becomes aware of the presence

of the stressor. During this stage, the hormones adrenaline and cortisol are released and trigger a whole cascade of physiological responses. The second stage is “resistance”, when the organism attempts to neutralize the stressor however it can and return the organism to a homeostatic state. The adaptations that occur during this stage can be beneficial or detrimental depending on the circumstances. In the case of exercise as a stressor, if it allows you to become stronger, that is a benefit, but if your blood pressure is raised as a response to stress, that may be detrimental. The third and final stage is “exhaustion”. The ability of the organism to adapt is not without limits. When the organism has used up all of the resources at its disposal and the stressor has not been neutralized, systems in the body will start to break down. At this stage the organism may succumb to the stressor and may ultimately lead to death (Selye, 1936).

Peter Sterling and Joseph Eyer (1988) proposed another concept that has gained popularity in the stress field, it is called allostasis . The theory of allostasis states that homeostasis can indeed be maintained but at a particular cost to the organism. The cost to the organism has also been called the “allostatic load.” Selye also realized that there was a price for maintaining homeostasis but he never named it, but the concept corresponds with second and third stages of his General Adaptation Syndrome (Selye, 1936).

Even Sigmund Freud discussed the concept of stress to include “stimuli of the mind” which he referred to as “instincts”. But, an instinct as opposed to an external stressor, has the characteristic of exerting a constant force instead of a momentary episode. Being internally generated, it follows that there is no escape from instincts (Riviere, 1959). What struck the current researcher the most about the description is that it is a perfectly apt description that can

be applied to psychological stress today. The concept of not being able to flee from thought processes is particularly telling.

In twenty years of practicing TCM and herbalism, the current researcher has been struck by the incidence of stress as either a primary or contributing factor in illness and disharmony. With more and more research being done on stress, it is becoming undisputable that stress can have a negative effect on every organ system of the body. Since classical Chinese medicine is a holistic paradigm, many of the protocols used in the medicine have been found to reduce the deleterious effects of stress on the body, mind and spirit.

Graham, Christian and Kiecolt-Glaser (2006) conducted a literature review discussing the role of age and stress on the immune system. One compelling suggestion in the literature is that early life stress may lead to the readjustment of an immune “set-point” that is resistant to later alteration. This has profound implications when conducting research on stress and not knowing the early life stress experiences of the subject population. Subjects may be evaluated for perceived or chronic stress in real time, but physiologically and psychologically responding to accumulated stress experiences from early life.

It is widely accepted that immune function declines with age, but in combination, stress and age place a much greater allostatic burden on the psychoimmunology of an individual (Hawkley & Cacioppo, 2004). Natural decreases in the innate and adaptive immune system occur within the aging process. During periods of perceived stress the body diverts energy away from the immune system to other systems involved in survival activities. When the perceived

stress becomes unrelenting, the effect can mirror, and in some instances, accelerate the effects of aging on the body and mind (Graham et al., 2006).

Cummings and Nutter (1993) conducted a pilot study at a small New England college to examine the relationship that utilization of stress management adaptive coping techniques had on cardiovascular disease risk and aspects of wellness. The population size of the study consisted of 22 women between the ages of 22 and 44. Three different measurement inventories were employed to measure the risk of cardiovascular disease, the Self Evaluation of Cardiovascular Risk Inventory, the Stress Management Checklist Inventory and the Measure Your Lifestyle Inventory. No discussion was made as to the validity of the three inventories. The Self Evaluation of Cardiovascular Risk Inventory included two variables, blood pressure and percentage of body fat, that were measured at the time the inventory questionnaire was administered. The findings of this pilot study showed that the use of stress related adaptive coping techniques were positively related to wellness, although the relationship was not significant. There was no mention of the time span that this pilot study covered. The researchers did admit that the study had limitations because of small sample size and not being more heterogeneous. The value of the study was primarily to identify stress as a potential causative factor in cardiovascular disease and to suggest further studies on the benefit of coping techniques to mediate those causes.

Epel (2009) completed a literature review citing studies involving psychological stress and metabolic stress on cellular aging. One interesting aspect of stress as it relates to aging is the fact that stress will tend to cause dysregulation in the hormonal system. Stress will shift the

levels of anabolic hormones that are in charge of the promotion of growth and repair in the body and leads to lower levels of androgens and IGF-1. At the same time, stress will increase the levels of cortisol that in turn may increase insulin causing a preferential deposit of abdominal fat that will in turn, release cytokines such as TNF-a and IL-6. Both of these promote inflammatory responses in the body. Stress will also lead to a disruption of the normal hypothalamic pituitary adrenal negative feedback loop.

A critical concept involved in cellular and biological aging of an organism is the telomere/telomerase maintenance system. Telomeres are a protective nucleoprotein end cap on a DNA strand. Telomerase is a ribonucleic reverse transcriptase cellular enzyme that has the ability to repair and add length to the telomeres. This is significant because when cortisol levels are raised by stress, it is suggested that the telomere/telomerase maintenance system is compromised, leading to shorter telomeres. Shortened telomeres are suspected in such diseases as cardiovascular disease, insulin resistance and diabetes, chronic kidney disease and stroke (Epel, 2009).

In surveying the literature about stress, it became clear that psychological stress effects every organ system in the body, and if unrelenting, will cause dysbiosis and disease. Cohen, Hamrick, Rodriguez, Feldman, Rabin and Manuck (2002), conducted research on the effect of stress on the lungs. It has been well established that stress will raise cortisol levels, and because cortisol can suppress the inflammatory immune response, they hypothesized that the release of more cortisol under stress could be associated with a greater incidence of upper respiratory infections. The study investigated three main hypotheses, 1) Since immune competence is

compromised by cortisol, will participants with larger acute stress induced cortisol be more likely to have increased risk of upper respiratory infection, 2) Natural Killer cells play a role in killing invading viruses, would those with a smaller acute stress induced rise in natural killer cytotoxic reactivity be more likely to have an episode of upper respiratory infection when stress levels were high vs. low and 3) Are greater acute stress induced rises in blood pressure associated with higher rates of illness in those confronted with stressful events in their natural environment. This is a well-designed research study that enrolled 114 college students who participated in two laboratory sessions and a twelve week follow-up. Measures taken during the laboratory sessions included cardiovascular outcomes, immune assays, cortisol assays, catecholamine assays, and whole blood Cr-release assay. Measures of background variables included the stressful life events scale, neuroticism scale taken from the Eysenck Personality Questionnaire and standard demographic control variables such as age, sex and race. The results of the study showed that participants exhibiting greater cortisol reactivity to acute stressors had increased risk for verified upper respiratory tract infection when naturalistic levels of stress were also high (Cohen et al., 2002).

Research proves that stress has both beneficial and detrimental potential, but chronic stress or perceived stress from which there is no escape, seems not to have an upside, and indeed places an allostatic load on the organism that can result in disease and death.

Bupleurum Presentation and Constitution

Huang Huang, a celebrated Chinese physician suggested in his book, *Ten Key Formula Families in Chinese Medicine*, that there exists a bupleurum constitution and presentation that

will inform the practitioner when the use of one of the bupleurum formulas is appropriate in treatment. Huang describes the bupleurum constitution as a person with medium to slightly thin build, a complexion that tends to be sallow yellow, greenish yellow or greenish pale and without luster. The skin will tend towards dryness and the musculature tone is firm (Huang, 1994).

The bupleurum presentation consists of three aspects not necessarily manifesting equally or simultaneously, they are: fullness and discomfort in the chest and hypochondriac regions of the body, alternating chills and fever, and symptoms along the pathway of the *Shao Yang* channel. The *Shao Yang* regions are the chest and hypochondria, the shoulders and nape of the neck, forehead, hips, lower abdomen, groin, and the lateral aspects of the body. If these regions of the body are affected by distending pain, achiness, lumps, or unusual sensations, this is considered a bupleurum presentation. The distinguishing pulse of this presentation is wiry (Huang, 1994).

Huang also discussed in another work, the signs and symptoms for the use of *Bupleurum and Dragon Bone* (*Chai Hu Long Gu Mu Li Tang Jia Jian*). Patients who complain of many symptoms without having any medical confirmation of their diseases that may include sleeping disorders, being easily frightened, feelings of uneasiness and restlessness, poor appetite, chills, constipation or diarrhea, and pain and fullness in the rib-side are with feeling of restriction. All of these signs and symptoms can be accompanied or made worse by stress, in fact, these are the manifestations of stress in TCM (Huang, 2011).

Bupleurum and Dragon Bone (*Chai Hu Long Gu Mu Li Tang Jia Jian*)

The formula Bupleurum and Dragon Bone (*Chai Hu Long Gu Mu Li Tang Jia Jian*) was chosen as the focus of the current study, not for the purpose originally stated for the formula in Zhang Zhong-Jing's *Shang Han Za Bing Lun* (Discussion of Cold-Induced Disorders and Miscellaneous Diseases) for treating patients who had received improper downward draining herbs, but for the more modern and widely accepted use of the formula to calm the shen. Today, the formula is used for more internally generated disharmonies of the Liver-Gall Bladder system rather than externally-contracted influences. The western concept of psychological stress translates to many of the signs and symptoms most associated with Liver Qi Stagnation and Liver Fire in Classical Chinese medicine. According to Chen and Chen (2009), “ *Chai Hu Jia Long Gu Mu Li Tang* is one of today's most popular formulas for stress management. Similar to *Xiao Yao San* (Rambling Powder) which helps patients cope with daily stressful situations, this formula tranquilizes the *Shen* (spirit), clears heat, and helps patients rest and fall asleep. Many psychosomatic disorders stem from Liver qi stagnation or Liver fire” (Chen & Chen, 2009, p. 720).

The original composition of the formula consisted of Bupleurum (*Chai Hu*), Dragon Bone (*Long Gu*), Scutellaria (*Huang Qin*), Ginger (*Sheng Jiang*), Minium (*Qian Dian*), Ginseng (*Ren Shen*), Cinnamon (*Rou Gui*), Poria (*Fu Ling*), Pinellia (*Ban Xia*), Rhubarb (*Da Huang*), Oyster Shell (*Mu Li*), and Jujube (*Da Zao*). Zhang Zhong-Jing included the use of the substance *Qian Dian* or Minium. This ingredient is also called red lead or lead oxide, and when ingested, it is dissolved in the stomach acid, leading to lead poisoning. Obviously, we no longer

use this substance so any modern iteration of the formula minus the original ingredients would be designated as “*Jia Jian*” meaning modified with additions or subtractions. The formula being used in this study has such a designation.

Although highly unlikely, taking this herbal formula may result in the following side effects; dry mouth, loose stools, headache, bloating, cramps, dizziness, light-headedness, feeling warmer than usual and nausea. There is also mention that this formula may reduce the effects of antibiotics.

The majority of research conducted on Bupleurum and Dragon Bone (*Chai Hu Long Gu Mu Li Tang Jia Jian*) has been in China and Japan. In Japan, the formula is known as *Saiko-ka-ryukotsu-borei-to* (SKRBT). In 1994 a study was conducted in Japan using the SKRBT formula to study its effect on serum corticosterone levels in mice. The mice were subjected to several different stressors that included immobilization, forced-swim, electric shock and psychological stress. Corticosterone is a glucocorticoid produced by rodents that is similar to cortisol in humans. The researchers found that the effect of SKRBT on serum corticosterone in stress models depends more on psychological stress than on physical stress. In the psychologically stressed mice, the formula exhibited an anti-stress effect that was dose-dependent. This action may be related to the concentration of the formula in the blood (Sasaki, Suzuki, Yoshizaki & Ando, 1994).

There are ample studies that implicate stress in hypertension and atherosclerosis. A 2013 study of the effect of the administration of SKRBT to hypertensive rats showed that the formula increased the number of endothelial progenitor cells (EPC) that function to repair vascular

injuries. The study also showed that there was a reduction in levels of IL-6, a pro-inflammatory cytokine, that is also involved in many disease conditions. The researchers concluded that the administration of SKBRT exhibited a protective effect on the cardiovascular system by increasing the function of EPCs, couple with an anti-oxidant effect that may influence the link between chronic inflammatory conditions and cardiovascular disease (Iijima, Daikonya, Takamatsu, Kanno, Magariyama, Yoshikawa, Takamiya, Ueda, Yakubo, Matsumoto, Ueno, Yamori, Fukuda & Kitanaka, 2013).

Literature Review Integration

The discussions in this chapter have relied on studies that have measured the physiological manifestation of stress (Selye, 1936; Sterling & Eyer, 1988; Graham et al., 2006; Hawkey & Cacioppo, 2004; Cummings & Nutter, 1993; Epel, 2009; Cohen et al., 2002). For the most part the scientific method engaged in these studies tends to be reductionist in nature. Organ systems like the cardiovascular or immune systems are studied in isolation and not in an integrated manner that considers the system in relation to the whole organism. The primary constructs of Chinese medicine do not perceive the body and mind in a reductionist manner. A central pillar of Eastern medical thought is that the mind and body form a continuum, and there is no distinction in the functioning of either. In treatment, the implication is that there is no difference in the way diseases of the mind are treated from those of the body (Daniel and Hoedeman (1997). The herbal formula used in this clinical trial functions according to Chinese medical principles. The current study was designed to fill the existing gap in the literature regarding the possible impact that the formula Bupleurum and Dragon Bone has on stress. To the

extent that it is possible in a small scale study, other factors in the lives of the study subjects will also be considered so that the current study is carried out in the holistic spirit of Traditional Chinese Medicine. Chapter Three will detail the method and procedures engaged in the current study.

Chapter Three: Method

Design

This capstone project is a small sample non-randomized clinical trial. It employed a mixed method research design to explore the impact of a proprietary modified herbal formula, Bupleurum and Dragon Bone (*Chai Hu Long Gu Mu Li Tang Jia Jian*), on perceived stress. The design of this research project included a pre-intervention measurement, an intervention, and a post-intervention measurement. In addition to these measurements, demographic information was gathered to explore the possible correlation of these variables on the Perceived Stress Scale Scores.

The Bupleurum and Dragon Bone Formula

The exact composition of the formula being used in this clinical trial is as follows:

- Bupleurum Chinese (*Chai Hu*) root 67.5mg
- Prepared Pinellia ternate (*Ban Xia*) rhizome 54.00mg
- Zingiber officinale (fresh ginger) (*Sheng Jiang*) rhizome 38.25mg
- Zizyphus jujube (*Da Zao*) (Red date) fruit 38.25mg
- Codonopsis pilosula (*Dang Shen*) root 38.25mg
- Os draconis (*Long Gu*) (Dragon bone) 36.00mg
- Concha ostreae (*Mu Li*) (Oyster shell) 36.00mg
- Coptis chinensis (*Huang Lian*) rhizome 36.00mg
- Cinnamon cassia (*Gui Zhi*) twig 22.50mg
- Cinnamon cassia (*Rou Gui*) bark 22.50mg

- Poria cocos sclerotium (*Fu Ling*) 22.50mg
- Poria paradisis (*Fu Shen*) (spirit Poria) 22.50mg
- Rheum officinale (*Da Huang*) rhizome 15.75mg
- Microcrystalline cellulose (Inactive ingredient) 50.00mg

In this formula, Radix Ginseng (*Ren Shen*) has been removed and Radix Codonopsis pilosula (*Dang Shen*) has been substituted due to its more neutral temperature and its equal ability to strengthen the middle *jiao*. The addition of Cinnamon cassia bark is to warm the spleen and encourage the production of qi and blood. Although Poria cocos (*Fu Ling*) is a normal ingredient in the formula, in this composition, Poria paradisis (*Fu Shen*) is added because of its stronger shen calming influence. Scutellaria (*Huang Qin*) was eliminated and Coptis (*Huang Lian*) included because it enters the Liver and Scutellaria (*Huang Qin*) does not. One of the herbs in this formula, namely Prepared Pinellia ternate (*Ban Xia*) has a toxicity warning in its raw form, as you can see, the prepared form is used in this formula, and the presence of Zingiber officinale (*Sheng Jiang*) insures that any potential toxicity is neutralized. No other herbs in the formula carry toxicity warnings.

For the clinical trial, the herbal formula was dispensed in 90 capsule bottles. Each capsule contained 450 grams of active ingredients and 50 grams of inactive microcrystalline cellulose. The formula was a 10:1 extract, meaning that 10 pounds of raw herbs were used to make 1 gallon of liquid, the liquid was then dried to an extract powder. Each participant in the study was given 2 bottles for a total of 180 capsules. Participants were instructed to take 2 doses per day, morning and evening, consisting of 3 capsules each. Each dose delivered 1,359 grams of the

active ingredients and 150 grams of the inactive ingredients. The dosing schedule was not modified according to differences in body weight.

Human Subjects Ethical Considerations

The current study was carried out consistent with current Federal guidelines for the ethical treatment of human subjects. The proposal for the current research was reviewed and approved by the Yo San University Institutional Review Board (IRB). A copy of the IRB approval letter is included in Appendix K.

Sample

The twenty participants in this research were solicited from the general population. The researcher conducted two rounds of recruitment. Inclusion criteria were as follows: male or female, between the ages of 20 and 80, must have either completed high school or possess a GED, must possess the ability to read and understand the study parameters, must self-identify as suffering from stress and must demonstrate a willingness and capacity to follow through with study directions and activities.

The exclusion criteria were as follows: individuals who were receiving acupuncture treatments, pregnant and nursing mothers, individuals who showed any indication of cognitive disorders, psychoses or severe specific anxiety or psychological conditions (e.g. bi-polar/ phobias/ obsessive/compulsive, etc.), individuals taking an herbal formula for stress, individuals who had a history of taking the herbal formula Bupleurum and Dragon Bone, individuals taking pharmaceutical drugs for high or low blood pressure, depression, anxiety or insomnia, individuals taking anti-psychotic or anti-seizure pharmaceutical drugs, and individuals from

“protected populations” as designated in the Yo San University IRB Handbook were all excluded.

Instruments

The first instrument used in the research was the advertisement text placed in the *Santa Monica Mirror*, *The Argonaut*, *UCLA Daily Bruin* and *Blue Pacific*. The purpose of this advertisement was to recruit potential participants in the clinical trial. See Appendix A.

The second instrument employed was the Pre-Screening Telephone Interview. At the top of the questionnaire the researcher logged the date and time of the interview, and then asked the questions covering all the inclusion and exclusion criteria. The prospective participant answered each question with a yes or no answer, and the researcher noted the answer on the interview sheet. At the conclusion of the interview, the researcher informed the prospective participant if she/he had met the inclusion and exclusion criteria to be eligible to participate in the research study. The prospective participants were informed immediately if they were eligible to participate. See Appendix B.

The third instrument consisted of an Oral Presentation. This instrument was read to the participants at the beginning of the data collection session introducing the researcher as the principal investigator and giving the participants specific instructions as the procedures and order for completing each element of the data gathering. Specific instructions were necessary to insure that the data integrity was maintained, and that the researcher did not see any data results that contained identifying information of the participants. All forms were sealed in an envelope and were given to the acupuncturist on site who was doing the tongue and pulse diagnosis. All data

was first given to current researcher's advisor, de-identified, and then transmitted to the current researcher for analysis. See Appendix C.

The fourth instrument used was the Waiver of Liability and Hold Harmless agreement. Because this clinical trial included an herbal formula that was to be ingested, it was necessary to inform the participants that they would assume all responsibility for any potential harm that was possible from ingesting the herbal formula. This instrument released the researcher, Yo San University, the Board of Directors and any and all employees from any litigation or monetary compensation as a result of injury or harm that may have occurred from taking the herbal formula. See Appendix D.

The fifth instrument was the Informed Consent. This form described in clear language whom the primary investigator was and all contact information, the purpose of the research, the procedures, possible risks and benefits, and confidentiality measures. The participants were also informed of their rights as participants and who to contact if they had any further questions as to any aspects of the research or their rights. The Informed Consent also included a disclaimer as to limits of liability. See Appendix E.

The sixth instrument presented was the Life Questionnaire. This document was used to gather demographic background information on the participants. This data was not used in the statistical analysis to answer the research question but was used incidentally to see possible correlations and perhaps form future hypotheses. See Appendix F.

The seventh instrument employed was the 14 item Perceived Stress Scale (PSS). Responses for each item of the scale could be answered from 0 to 4, with 0 corresponding to

Never, 1 to Almost Never, 2 to Sometimes, 3 to Fairly Often and 4 to Very Often. The scale is used to assess the degree to which the participants evaluated their lives as being stressful during the preceding month. Items were not tied to any particular event and were sensitive to the non-occurrence of events as well as life circumstances. Scores of the PSS-14 were obtained by reversing the scores of the seven positive items on the scale. See Appendix G.

The eighth instrument was the Daily Dosing Log. The participants were asked to take the herbal formula twice each day. The log simply listed day 1 through day 30. Each day had an A.M. and P.M. designation that the participants were to place a checkmark on, or any other indication that they had taken the daily dose. The participants were informed that they could include anecdotal comments for each day if they were so inclined. The actual number of days the participants took the formula was 29. See Appendix H.

The final instrument employed was a Tongue and Pulse chart. A licensed acupuncturist was on site to conduct a tongue and pulse diagnosis for each participant at the end of the data gathering session and before they began taking the herbal formula. The purpose for gathering this information was to take a baseline reading before the herbal formula was administered and compare the tongue and pulse at the end of the trial period. See Appendix I.

Data Collection Procedures

The data collection process began as soon as 20 eligible participants were approved, after having been qualified through the Pre-Screening Questionnaire. The names of the twenty participants were entered onto a list that was secured in a locked file cabinet at the business office of the primary investigator. Two data collecting sessions were scheduled. The first group

of participants began on September 8, 2103 and completed the trial on October 6, 2013. The second group began on November 10, 2013 and completed the trial on December 8, 2013.

On the day of the data collection, the participants arrived at the designated space at the Yo San University campus and were greeted by the primary investigator. The participants were asked to present a form of identification so it could be compared to the list of approved participants. Once identity had been established, a numerically de-identified packet containing Waiver of Liability and Hold Harmless Agreement, the Informed Consent, the Life Questionnaire, the Perceived Stress Scale, and an empty and unsealed brown manila envelope was given to each participant. Each numbered packet was matched with the name of the participant receiving it, this list that identifies the participant and the packet received, will be kept in a secured and locked area in the office of the primary investigator's advisor. The primary investigator now only used the numerical and de-identified material from then on.

The participants were then instructed to proceed to a licensed acupuncturist, who was present, to have a tongue and pulse diagnosis according to the principles of Chinese medicine. The acupuncturist listed the results for each participant according to the de-identified numeric on the set of documents. The information gathered from this procedure was not used as part of the statistical analysis to answer the research question. The information may be used at a later date to form hypotheses for future research.

The principal investigator read through the Informed Consent, after finishing, he asked if there were any questions. Once all, if any, questions were addressed, the participants were

instructed to sign and date the Waiver of Liability and Hold Harmless Agreement and Informed Consent. The principal investigator verified that all forms were signed by visual confirmation.

All participants then completed the Life Questionnaire and the Perceived Stress Scale. Upon completion of the questionnaires, the participants placed the documents into the manila envelope provided and proceeded to the licensed acupuncturist on site.

The acupuncturist listed the results of the tongue and pulse on the forms provided to the participants and after completion, that form was also placed into the manila envelope, and the envelope was sealed. The acupuncturist maintained possession of the data until they were delivered to the office of the principal investigator's advisor.

Each participant then proceeded to the primary investigator to receive the herbal formula and the Daily Dosing Log. Once the participants received these items, they had completed the first session of the research and were free to leave.

The principal investigator's advisor was the only person to open the envelopes. The principal investigator's advisor then photo copied the Perceived Stress Scale, Life Questionnaire and Tongue and Pulse Diagnosis for each participant and retained all original documents in a locked and secured area of his office. The reason for this procedure was because the principal investigator had a stated conflict of interest statement concerning this research. This procedure ensured that the data collected was free of any bias.

At the end of the one month clinical trial period, the participants returned to the Yo San University campus. The participants were once again identified against a master list of the qualified sample. The participants were given a manila envelope that had been de-identified and

carried only a numeric identifier. The participants once again completed the 14 item PSS and after completing, deposited it and the Daily Dosing Log into the manila envelope and took the envelope to the acupuncturist on site. A tongue and pulse diagnosis was then performed by the acupuncturist. At the end of the tongue and pulse diagnosis, the participants placed the PSS, Daily Dosing Log and Tongue and Pulse sheet into the manila envelope and sealed the envelope and handed it to the acupuncturist. The participants then proceed to the primary investigator and were given the honorarium for their participation. The amount of the honorarium was \$50.00.

The data were collected from the participants using the Perceived Stress Scale developed by Cohen, Karmack and Mermelstein (1983). The Perceived Stress Scale is the most widely used psychological instrument for measuring the perception of stress. The questions are of a general nature and are relatively free of content specific to any sub-group. The reliability and validity of the 14 item PSS were investigated by Cohen and associates (1983) through three studies: two in college students and one in a community smoking-cessation program. Cronbach's alpha measures of internal consistency for the three samples were 0.84, 0.85, and 0.86 respectively. Similarly, Cohen and Williamson (1988) reexamined the psychometric characteristics of PSS in 2,387 residents in the United States. The researchers provided evidence of the reliability of the PSS scale as well as evidence of the construct validity when correlated with other valid measures.

Data Analysis

The data analysis for this capstone project was performed from data obtained from two measurement instruments namely, the 14 Item Perceived Stress Scale and the Life Questionnaire.

Other analyses were performed on the demographic information obtained from the Life Questionnaire. The Perceived Stress Scale is one of the most common metrics used in relation to stress theory; the Life Questionnaire was composed by the principal investigator to gather common demographic data and it has no reliability or validity values attached to it.

The clinical trial was conducted and the data collected to answer the research question: Does a modified proprietary herbal formula Bupleurum and Dragon Bone (*Jia Wei Chai Hu Long Gu Mu Li Tang Jia Jian*) reduce stress? The data from the PSS were used to answer this question, the remainder of the data from the Life Questionnaire were used to make inferences, investigate correlations and, in the future, form new hypotheses for further study.

Table 1: Designation of Instrument and Data Description

Variable	Qualitative	Quantitative	Continuous	Numeric	Ordinal	Interval	Ratio
PSS Score		X		X			
Life Questionnaire	X	X	X		X	X	

The Perceived Stress Scale was designed for samples with at least a junior high school education, for the purposes of this study one of the inclusion criteria was a high school education or GED. The items on this scale are easy to understand and the response alternatives are simple to grasp. The questions are quite general in nature and free of content specific to any sub population group. The PSS-14 scores are obtained by reversing the scores on the seven positive items e.g., 0=4, 1=3, 2=2, etc., and then summing across all 14 items. Items 4,5,6,7,9,10, and 13 are the positively stated items. Table 2 illustrates how the scoring was accomplished for each of the participants using the raw scores to arrive at the coded scores. Only the coded scores were used to do statistical analyses.

Table 2: Pre and Post PSS Scores

Item	Raw Data	Coded Data
1	0	0
2	4	4
3	1	1
4	2	2
5	0	4
6	3	1
7	4	0
8	1	1
9	3	1
10	1	3
11	2	2
12	2	2
13	0	4
14	4	4
Score		29

The next analysis was performed to determine the central tendency of the scores. The mean, median, range and standard deviation for all scores from the participant sample were

computed. The reason for making these calculations was to determine if the scores reflected normal distribution or were skewed.

Comparisons were made between the pre and post intervention scores. After the data were compiled, either a two-tailed or one-tailed dependent t-test was performed to ascertain the statistical significance of the hypothesis. The remainder of analysis was accomplished by examining data pertinent to categories on the Life Questionnaire. As mentioned before, this questionnaire was composed by the principal investigator, and as such, has not been subjected to any tests for reliability or validity. These metrics and categories will be used for correlation analysis.

Chapter Four: Results

Data overview

The main focus of this clinical trial was to determine the effects of a modified and proprietary classic herbal formula known as *Bupleurum and Dragon Bone* (*Chai Hu Long Gu Mu Li Tang Jia Jian*) on the test scores achieved by a sample of twenty participants taking the fourteen item Perceived Stress Scale. The clinical trial hypothesis was that the scores achieved on the Perceived Stress Scale would be lower after taking the herbal formula for a period of one month, than the scores achieved prior to taking the herbal formula. The accompanying null hypothesis stated that there would be no change in scores between the pre and post intervention on the Perceived Stress Scale.

This clinical trial consisted of the participation of twenty human subjects from a possible pool of thirty eligible participants who were pre-screened in a telephone or in-person interview where inclusion and exclusion criteria were met.

Univariate Descriptive Results

1. Age

The trial population consisted of 20 participants, the median age was 53, the mean age was 52.8, the standard deviation was 13.3, and the range of ages was 27 to 76. See Table 3 below.

Table 3: Participant Age

<i>Variable</i>	<i>N</i>	<i>Mean</i>	<i>SD</i>	<i>Median</i>	<i>Minimum</i>	<i>Maximum</i>
<i>Age</i>	20	52.8	13.3	53	27	76

Participant ages were further arranged into quartile groups as follows: 27-45, 46-52, 54-62 and 64-76. See Table 4 below.

Table 4: Age Groups

<i>Variable</i>	<i>N</i>	<i>Percent</i>	
27-45	5	25.0	
46-52	5	25.0	
<i>Age Groups</i>	54-62	5	25.0
	64-76	5	25.0
Total	20	100.0	

An ANOVA or analysis of variance of the pre and post change in scores on the Perceived Stress Scale comparing the four age groups in Table 2 above, was not significant ($F(3,16)= 1.97$, $p=.159$). As displayed in Table X below, the youngest age group and middle age group, those aged 54 to 62, showed greater average decreases in perceived stress, -13.6 and -12.6 respectively

compared to the second youngest and oldest age groups with average decreases of -5.6 and -3.0 respectively. See Table 5 below.

Table 5: ANOVA

<i>Age Group</i>	<i>N</i>	<i>Mean</i>	<i>SD</i>	<i>F</i>	<i>p Value</i>
27-45	5	-13.6	9.1	1.97	0.159
46-52	5	-5.6	9.3		
54-62	5	-12.6	5.5		
64-76	5	-3.0	8.6		
Total	20	-8.7	8.9		

2. Gender

The participant population consisted of 15 females and 5 males. See Table 6 below.

Table 6: Gender

<i>Variable</i>	<i>Frequency</i>	<i>Percent</i>
<i>Gender</i>		
<i>Female</i>	15	75.0
<i>Male</i>	5	25.0
<i>Totals</i>	20	100.0

3. Ethnicity

Participants could choose from the categories of African-American, Caucasian, Hispanic or Other. One participant who chose the “Other” category, identified as Asian and has been designated as such. Another participant choosing “Other” self- identified as Caucasian/Latin and has been designated as such. A third choosing “Other” did not specify a particular ethnic background and has been identified as “Other.” See Table 7 below.

Table 7: Ethnicity

<i>Variable</i>	<i>Frequency</i>	<i>Percent</i>
<i>Ethnicity</i>		
<i>African-American</i>	2	
<i>Caucasian</i>	14	
<i>Hispanic</i>	1	
<i>Asian</i>	1	
<i>Caucasian/Latin</i>	1	
<i>Other</i>	1	
<i>Totals</i>	20	100.0

4. Education

Of the 20 participants, 9 had completed graduate studies, 12 had completed college studies and only 2 had gone no higher than a high-school education. See Table 8 below.

Table 8: Education

<i>Variable</i>	<i>Frequency</i>	<i>Percent</i>
<i>Education</i>		
<i>High School</i>	2	10.0
<i>College</i>	12	60.0
<i>Graduate School</i>	6	30.0
<i>Totals</i>	20	100.0

5. Military Service

Of the total population of participants, 2 identified as having performed military service and 18 identified as having not performed any military service. See Table 9 below.

Table 9: Military Service

<i>Variable</i>	<i>Frequency</i>	<i>Percent</i>
<i>Military Service</i>		
<i>Yes</i>	2	10.0
<i>No</i>	18	90.0
	20	100.0

6. Occupation

The 20 participants were requested to specify their occupations, the breakdown is as follows: 1 Actress, 2 Acupuncturists, 1 Administrative Assistant, 1 Artist, 1 Construction Worker, 1 Counselor, 1 Film Producer, 1 Homemaker, 1 Paralegal, 1 Real Estate Agent, 3 Retirees, 2 Self-employed, 3 Teachers and 1 Travel Agent. See Table 10 Below.

Table 10: Occupation

<i>Variable</i>	<i>Frequency</i>	<i>Percent</i>
<i>Actress</i>	1	5.0
<i>Acupuncturist</i>	2	10.0
<i>Adm. Asst.</i>	1	5.0
<i>Artist</i>	1	5.0
<i>Construction</i>	1	5.0
<i>Counselor</i>	1	5.0
<i>Film Production</i>	1	5.0
<i>Homemaker</i>	1	5.0
<i>Paralegal</i>	1	5.0
<i>Real Estate</i>	1	5.0
<i>Retired</i>	3	15.0
<i>Self Employed</i>	2	10.0
<i>Teacher</i>	3	15.0
<i>Travel Industry</i>	1	5.0
<i>Total</i>	20	100.0

Marital Status

The 20 participants were asked to select one of the following choices: Single, Married, Separated and Divorced. The responses were, 9 Singles, 6 Married, 1 Separated and 4 Divorced. See Table 11 below.

Table 11: Marital Status

<i>Variable</i>	<i>Frequency</i>	<i>Percent</i>
<i>Marital Status</i>		
<i>Single</i>	9	45.0
<i>Married</i>	6	30.0
<i>Separated</i>	1	5.0
<i>Divorced</i>	4	20.0
<i>Total</i>	20	100.0

8. Household Income

The participants were asked to provide data on household income. Of the 20 participants, 3 declined to provide information, of the 17 that provided data, the breakdown is as follows: 1=10K, 1=11K, 1=19K, 3=25K, 2=30K, 1=35K, 2=60K, 1=78K, 1=97K, 1=100K, 2=136K and 1=150K (see Table 12 below). The mean income of the 17 respondents was 60.4K. The Standard Deviation was 47.2K, and the median income was 35K. See Table 12 below.

Table 12: Income

<i>Variable</i>	<i>Frequency</i>	<i>Percent</i>
<i>Income</i>		
<i>10K</i>	1	5.88
<i>11K</i>	1	5.88
<i>19K</i>	1	5.88
<i>25K</i>	3	17.64
<i>30K</i>	2	11.76
<i>35K</i>	1	5.88
<i>60K</i>	2	11.76
<i>78K</i>	1	5.88
<i>97K</i>	1	5.88
<i>100K</i>	1	5.88
<i>136K</i>	2	11.76
<i>150K</i>	1	5.88
<i>Totals</i>	17	99.96

The income data were further broken down into three groups to perform more statistical analysis. The four income groups were 10K – 25K, 30K – 60K and 78K-150K. An ANOVA or analysis of variance of the pre and post change in scores on the Perceived Stress Scale was conducted and found to be not significant ($F(2,14)=0.90$, $p\text{-value}=.432$). As displayed in Table

13 below, those in the higher income group, earning between 78K and 150K annually, reported the least decrease in perceived stress compared to the other two groups, although the middle income group decreased slightly more than those earning the least per year. See Table 13 below.

Table 13: ANOVA for Income Groups

<i>Variable</i>	<i>N</i>	<i>Mean</i>	<i>SD</i>	<i>F</i>	<i>p-value</i>
<i>Income</i>					
<i>10K-25K</i>	3	-10.0	2.6	0.9	0.432
<i>30K-60K</i>	9	-12.4	9.6		
<i>78K-150K</i>	5	-5.8	9.6		
<i>Total</i>	17	-10.0	8.9		

9. Perceived Stress Scale Scores

The Perceived Stress Scale scores were calculated according to the formula mentioned on page 38. The Raw Data Pre-Formula Score indicates how the participants answered the 14 items on the scale during the data collection session. The Coded Data Pre-Formula Score indicates the scoring after the reversal on the seven positive items on the Perceived Stress Scale. The same method was used to obtain the Post Formula Scores. See Table 14 below.

Table 14: Perceived Stress Scale Scores

<i>Participant</i>	<i>1</i>	<i>2</i>	<i>3</i>	<i>4</i>	<i>5</i>	<i>6</i>	<i>7</i>	<i>8</i>	<i>9</i>	<i>10</i>
<i>Pre Raw</i>	33	25	35	40	36	36	34	30	30	35
<i>Pre Coded</i>	23	27	9	40	34	14	32	26	26	33

<i>Participant</i>	<i>11</i>	<i>12</i>	<i>13</i>	<i>14</i>	<i>15</i>	<i>16</i>	<i>17</i>	<i>18</i>	<i>19</i>	<i>20</i>
<i>Pre Raw</i>	36	34	35	28	32	30	30	33	29	38
<i>Pre Coded</i>	26	38	25	30	30	24	28	23	31	22

<i>Participant</i>	<i>1</i>	<i>2</i>	<i>3</i>	<i>4</i>	<i>5</i>	<i>6</i>	<i>7</i>	<i>8</i>	<i>9</i>	<i>10</i>
<i>Post Raw</i>	31	14	36	30	33	33	31	24	30	31
<i>Post Coded</i>	17	20	9	14	25	14	11	12	20	23

<i>Participant</i>	<i>11</i>	<i>12</i>	<i>13</i>	<i>14</i>	<i>15</i>	<i>16</i>	<i>17</i>	<i>18</i>	<i>19</i>	<i>20</i>
<i>Post Raw</i>	38	10	34	26	30	27	36	29	28	31
<i>Post Coded</i>	34	24	30	16	18	27	8	18	16	11

When all scores had been tabulated, the Pre Formula Coded Scores were compared to the Post Formula Coded Scores to arrive at the Net Score Change. See Table 15 below.

Table 15: Net Score Change

<i>Participant</i>	<i>1</i>	<i>2</i>	<i>3</i>	<i>4</i>	<i>5</i>	<i>6</i>	<i>7</i>	<i>8</i>	<i>9</i>	<i>10</i>
<i>Pre- Coded</i>	23	27	9	40	34	14	32	26	26	33
<i>Post- Coded</i>	17	20	9	14	25	14	11	12	20	23
<i>Net Change</i>	-6	-7	0	-26	-9	0	-21	-14	-6	-10
<i>Participant</i>	<i>11</i>	<i>12</i>	<i>13</i>	<i>14</i>	<i>15</i>	<i>16</i>	<i>17</i>	<i>18</i>	<i>19</i>	<i>20</i>
<i>Pre-Coded</i>	26	38	25	30	30	24	28	23	31	22
<i>Post-Coded</i>	34	24	30	16	18	27	8	18	16	11
<i>Net Change</i>	+8	-14	-5	-14	-12	+3	-20	-5	-15	-11

10: Summary Statistics for Perceived Stress Scale (n=20).

An analysis was done to determine distribution and/or skewness of scores. Skewness (SK) divided by the Standard Error of Skewness (SE) provides an assessment of the normality of distribution. SK/SE values within +/- 2.0, indicate a normal bell-shaped distribution. For the Perceived Stress Scores, the assumption of normality underlying the comparative statistics (*t-test* and ANOVA) have been met. See Table 16 below.

Table 16: Summary Statistics for Perceived Stress Scale (n=20).

	<i>Pre-Formula</i>	<i>Post-Formula</i>	<i>Change</i>
<i>Mean</i>	27.1	18.4	-8.7
<i>Median</i>	26.5	17.5	-9.5
<i>Mode</i>	26	11	-14
<i>Std. Deviation</i>	7.3	7.1	8.9
<i>Skewness(SK)</i>	-0.6	0.6	0.1
<i>Std. Error of SK</i>	0.5	0.5	0.5
SK/SE	-1.2	1.1	0.2
<i>Minimum</i>	9	8	-26
<i>Maximum</i>	40	34	8

11: Significance of Score Decrease

A paired *t-test* was used to determine the significance of the change in perceived stress scores from pre to post formula. The decrease was highly significant ($t(19)=4.37$, $p < .001$). See Table 17 below.

Table 17: Significance of Score Decrease

	<i>Mean</i>	<i>SD</i>	<i>T</i>	<i>df</i>	<i>p-value</i>
<i>Pre-Formula</i>	27.05	7.258	4.370	19	< .001
<i>Post-Formula</i>	18.35	7.081			

Chapter Five: Discussion

This small sample non-randomized clinical trial was conducted to determine if the modified and proprietary herbal formula based on the classic herbal formula *Bupleurum and Dragon Bone (Chai Hu Long Gu Mu Li Tang Jia Jian)* had an effect on perceived stress. The researcher's hypothesis was that administration of the herbal formula for one month would decrease perceived stress. The null hypothesis for this trial stated that there would be no difference between the pre and post formula scores of perceived stress as measured by the 14 Item Perceived Stress Scale. The statistical results obtained from analyzing the pre and post scores determined that the null hypothesis would not be accepted. A paired t-test was used to determine the significance of the change in perceived stress from pre to post test. The decrease in scores was highly significant, ($t(19) = 4.37, p < .001$).

Implications for Theory

Stress has no exact equivalent in the theoretical literature of Chinese medicine, nor do we find a definition of stress in Western literature that will satisfy all in the field of stress research. This clinical trial employed a Chinese herbal formula with a traditional function of harmonizing the *shaoyang*, unblocking the three yang stages, and calming the mind and spirit. The major condition at work here is one of constraint. Constraint can take many forms of physical manifestation including, tightness, anxiety, headache, insomnia, irritability, and hypochondriac pain and distention. In Chinese theory, the organ system that is most involved in this mechanism is the Liver. One of the most important functions of the Liver is the up-bearing and down-bearing of *qi* in the body. In western medical terms, it has been demonstrated in the research

literature that the stress response elicits the release of certain neurotransmitters in the body that cause a cascade of systemic adjustments to divert the body's resources to systems in the body that deal with the fight or flight response. In so doing, the body diverts resources away from the digestive system, immune system and any other organ system not directly involved in survival. In accomplishing this task, there is an impact on the *qi* dynamics in the body that causes stagnation of the Liver *qi*. When the body diverts energy away from the digestive system, for instance, the *qi* mechanism will become stagnant, this may cause an obstacle or blockage in the free flow of energy that is necessary for proper Liver function. Liver *qi* stagnation will lead to more of the *qi* dynamic to become impeded. According to Chinese medical theory, as soon as Liver *qi* is depressed, the depressed *qi* dynamic causes disease.

The current trial demonstrated that the herbal formula *Bupleurum and Dragon Bone (Chai Hu Long Gu Mu Li Tang Jia Jian)* is effective in alleviating the constraint of the *qi* dynamic in the body and relieving the effects of stress. In terms of Western medicine, this formula is effective in regulating the function of the hypothalamic-pituitary-adrenal axis and its relation to the allostatic load placed on the body by stress.

Implications for Practitioners

The formula employed in this clinical trial is well known by most practitioners of classical Chinese medicine and TCM. Any practitioner who has been in practice for any length of time cannot help but notice the role that stress plays in the etiologies of disease states in their patients. The results of this clinical trial demonstrates a practical application for the use of the herbal formula *Bupleurum and Dragon Bone (Chai Hu Long Gu Mu Li Tang Jia Jian)* in the

reduction of stress. In the area of healthy ageing and longevity, this clinical trial has implications for the use of this formula to help restore the normal ‘qi mechanisms’ of the body leading ultimately to a longer and healthier lifespan.

Limitations of the Current Study

The first limitation of this study was the sample size. Although the current researcher was able to enlist the minimal amount of participants to establish some validity for the study, many statistical measures for correlation could not be performed when the sample size was broken down into sub-groups because they lacked adequate numbers. Another limitation was all the data was gathered and coded by the current researcher, and although every effort was taken to ensure absence of bias, an independent researcher not having a vested interest in the outcome of the trial could have been employed, which leads to the next limitation. This trial was self-funded by the current researcher, and the budget allocated for the trial did not allow for additional staff. The next limitation was the absence of a control group using a placebo formula to determine if the results of the trial were due to the active ingredients of the *Buplerum and Dragon Bone(Chai Hu Long Gu Mu Li Tang Jia Jian)*, formula or just the “placebo effect”. A further limitation of the trial was the use of four different licensed acupuncturists to perform the tongue and pulse diagnoses; it is commonly accepted that each practitioner may have unique interpretations of these metrics.

Recommendations for Future Research

Future research on the use of *Bupleurum and Dragon Bone(Chai Hu Long Gu Mu Li Tang Jia Jian)* for stress management should be done using a randomized, placebo controlled

trial and the sample size of the study should be much larger to ensure significance. A study including a group currently using Western pharmaceuticals should be included for comparison purposes. Western medical diagnoses of stress could be used as inclusion criteria for participants in a clinical trial, coupled with a differential diagnosis by an Eastern practitioner. An area that needs to be addressed in future studies is that of physiological bio-markers and herbal formulas. Studies should be conducted that measure the effect of herbal formulas on levels of cortisol, norepinephrine, serotonin and other bio-markers involved in the stress response. Further studies also need to be conducted that explore the effect of herbal formulas on areas of the brain involved in the stress response. Elements of potential physical and/or psychological dependence should be explored in future research.

There is an inherent problem in the research of herbal formulas that confound the accepted scientific method. In most cases involving Western medical research on pharmaceuticals, one molecule or active ingredient is being tested; in herbal formulas, there may be tens if not hundreds of active ingredients acting synergistically. In future research, a way must be found to overcome the non-integration of Eastern and Western methodologies.

Conclusion

The current study found that the herbal formula *Bupleurum and Dragon Bone* (*Chai Hu Long Gu Mu Li Tang Jia Jian*) had a statistically significant effect in lowering scores on the Perceived Stress Scale. The fact that the results of the study surpassed minimum standards of significance is promising for further research into this formula. The implication of these findings

is that practitioners of both Eastern and Western medicine have a viable tool to prescribe to their patients who are seeking ways to manage stress.

In terms of the integration of Chinese and Western medicine, the current study suggests that this herbal formula may be able to replace many pharmaceuticals that carry with them the potential of physical and/or psychological dependence and addiction. In addition, it is the function of Chinese medicine to address root causes of disharmony and bring the body back to a state of health, this may vary from the function of Western pharmaceuticals that may be more palliative in nature while not addressing the underlying disharmony.

The current study has shown examples of the detrimental effects of stress on most of the organ systems of the body and epigenetically on the loss of telomere length. The slow accumulation of those effects places an allostatic load on the body that has direct implications for the healthy aging and longevity of human beings. The current study has given Western and Eastern practitioners a viable tool for their patients suffering from stress.

REFERENCES

- Bernard, C. (1961). *Introduction to the Study of Experimental Medicine*. (H.C. Greene Trans.) Collier Books: New York, New York. (Original work published in 1865).
- Cannon, W. B. (1932). Homeostasis. In *The Wisdom of the Body*. Retrieved from www.Panarchy.org/cannon/homeostasis.1932.html.
- Chen, J. K., and Chen, T. T. (2009). *Chinese Herbal Formulas and Applications: Pharmacological Effects & Clinical Research*. City of Industry, California: Art of Medicine Press, Inc.
- Cohen, S., Hamrick, N., Rodriguez, M. S., Feldman, P. M., Rabin, B. S. & Manuck, S. B. (2002). Reactivity and Vulnerability to Stress-Associated Risk for Upper Respiratory Illness. *Psychosomatic Medicine*, 64, 302-310.
- Cohen, S., Kessler, R. & Gordon, L. (1995). *Measuring Stress*. Oxford University Press: Oxford, England.
- Cummings, C. A., & Nutter, J. (1991). The relationship of stress management adaptive coping techniques to cardiovascular disease risk. *Wellness Perspectives*, 7(4).
- Epel, E. (2009). Psychological and metabolic stress: A recipe for accelerated cellular aging? *Hormones*, 8(1), 7-22.
- Flaws, B. (1995). *The Secret of Chinese Pulse Diagnosis*. Boulder, Colorado: Blue Poppy Press, Inc.
- Freud, S. (1915/1959). Instincts and Their Vicissitudes. In *Collected Papers of Sigmund Freud*, (Joan Riviere Ed.) Vol. IV. New York.
- Graham, J. E., Christian, L. M., & Kiecolt-Glaser, J. K. (2006). Stress, Age, and Immune Function: Toward a Lifespan Approach. *Journal of Behavioral Medicine*, Vol. 29, No. 4, doi: 10.1007/s10865-006-9057-4.

- Hallfors, D. D. & Saxe, L. (1993). The Dependence Potential of Short Half-Life Benzodiazepines: A Meta-Analysis. *American Journal of Public Health*, 83 (9), 1300-1304.
- Hallman, R. (2005). The Need for Homeostasis. In *The Living Environment: Biology*, (rev. ed.). New York, New York: AMSCO School Publications.
- Hawkley, L. C. & Cacioppo, J. T. (2004). Stress and the ageing immune system. *Brain. Behav. Immun.* 18, 114-119.
- Hsu, H. & Preacher, W. G. (Eds.) (1981). *Shang Han Lun: The Great Classical of Chinese Medicine*.
- Huang, H. (1994). *Ten Key Formula Families in Chinese Medicine*. (Michael Max, Trans.) Seattle, Washington: Eastland Press.
- Huang, H. (2011). *Huang Huang's Guide to Clinical Application of Classic Formulas*. (Suzanne Robidoux, Ph.D., Trans.) Beijing, China: People's Medical Publishing House.
- Iijima, H., Daikonya, A., Takamatsu, S., Kanno, A., Magariyama, K., Yoshikawa, K., Takamiya, T., Ueda, Y., Yakubo, S., Matsumoto, T., Ueno, T., Yamori, Y., Fukuda, N. & Kitanaka, S. (2013). Effects of the herbal medicine composition "Saiko-ka-ryukotsu-borei-To" on the function of endothelial progenitor cells in hypertensive rats. *Phytomedicine*, 20(3), 196-201.
- IMS Institute For Healthcare Informatics (2010). Retrieved from [www.imshealth.com/deployedfiles/imshealth/Global/Content/StatisticFile/TopLine_Data/Top Therapy Classes by U.S.RXs.pdf](http://www.imshealth.com/deployedfiles/imshealth/Global/Content/StatisticFile/TopLine_Data/Top%20Therapy%20Classes%20by%20U.S.RXs.pdf).
- Maciocia, G. (1995). *Tongue Diagnosis in Chinese Medicine* (Revised Edition).Seattle, Washington: Eastland Press, Inc.
- Maciocia, G. (2005). *The Foundations of Chinese Medicine: A Comprehensive Text for*

- Acupuncturists and Herbalists* (2nd ed.). Churchill Livingstone: London, England.
- NCCAM (2013). Retrieved from nccam.nih.gov/health/whatisacam.
- Sasaki, K., Suzuki, K., Yoshizaki, F. & Ando, T. (1994). Effect of Saiko-ka-ryukotsu-borei-to on Stress-Induced Increase of Serum Corticosterone in Mice. *Bio. Pharm. Bull.*, 18(4), 563-565.
- Sapolsky, R. M. (2004). *Why Zebras Don't Get Ulcers: The Acclaimed Guide to Stress, Stress Related Diseases, and Coping* (3rd ed.). St. Martin's Griffin: New York, New York.
- Scheid, V., Bensky, D., Ellis, A. & Barolet, R. (2009). *Chinese Herbal Medicine, Formulas & Strategies* (2nd ed.). Seattle, Washington: Eastland Press, Inc.
- Selye, H. (1936). A syndrome produced by diverse nocuous agents. *Nature*, 138, 32.
- Smith, N. (2012). Employees Reveal How Stress Affects Their Jobs. Retrieved from www.businessweekdaily.com/2267-workplace-stress-health-epidemic-preventable-employee-assistance-programs.html.
- Sterling, P. & Eyer, J. (1988). Allostasis: A new paradigm to explain arousal pathology. In S. Fisher & J. Reason (Eds.), *Handbook of life, stress, cognition and health* (629-649). New York, New York: J. Wiley & Sons.
- Vogel-Ciernia, A., Scarsski, M. & Stout, D. (n.d.). History of Benzodiazepines. Retrieved from <http://nawrot.psych/nodak.edu/465Projects06/Benzo/History.htm>
- Wikipedia (2014). Retrieved from en.wikipedia.org/wiki/Classic_Chinese_medicine.
- Wikgren, M., Maripuu, M., Karlsson, T., Nordfjall, K., Bergdahl, J., Hultdin, J., Del-Favero, J., Roos, G., Nilsson, L.G., Adolfsson, R. & Norrback, K.F. (2012). ShortTelomeres in depression and the general population are associated with hypocortisolemic state. *Biol. Psychiatry*, Feb.15; 71(4): 294-300. doi: 10.1016/j.biopsych.2011.09.015.

Weber, D. & Hoedeman, W. (1997). A Theoretical and Practical Approach to Psychodynamics Using TCM. *Pacific Journal of Oriental Medicine*, 10, 27.

Appendix A: Text of Advertisement

TEXT OF ADVERTISEMENT

PATICIPANTS NEEDED FOR RESEARCH IN STRESS

As a participant in this study, you will be asked to complete a stress questionnaire at the beginning and the end of the study; take an herbal formula to determine its effect on stress; keep a log of twice daily dosing.

Your participation would involve two sessions, each of which is approximately thirty minutes.

Inclusion criteria: Male, Female or Transgender, 20-80 years of age, command of English language, ability to read and understand study parameters, self-identified as suffering from stress, demonstrates willingness and capacity to follow through with study direction and activities.

Exclusion criteria: Individuals who show any indications of cognitive disorders, psychoses or severe specific anxiety or psychological conditions (e.g. Bi-polar/ Phobias/ or Obsessive/Compulsive), individuals who are presently taking an herbal formula for stress, any individuals who are presently taking or have taken the herbal formula *Bupleurum and Dragon Bone* (*Chai Hu Lon Gu Mu Li Tang*), individuals who are presently taking pharmaceutical drugs to control high or low blood pressure, depression, anxiety or insomnia, individuals who are presently taking anti-psychotic or anti-seizure pharmaceutical drugs, pregnant women and nursing mothers and individuals presently receiving acupuncture treatments.

In appreciation for your time, you will receive an incentive payment at the conclusion of your participation.

For more information about this study, or to volunteer for this study, please contact:

George Lamoureux

at

877-679-5464

Tuesday-Friday 11 a.m. to 6 p.m. or

georgel@jingherbs.com

This study has been reviewed by, and received ethics clearance through, the Institutional Review Board of Yo San University, 13315 W. Washington Blvd., Los Angeles, California 90046

Appendix B: Pre-Screening Telephone Interview

PRE-SCREENING TELEPHONE INTERVIEW

Date: **Time:** **Determination:** **Accepted** **Rejected**

- 1) Are you between the ages of 20 and 80 ? Yes No
- 2) Have you completed High School or possess a GED ? Yes No
- 3) Will you be able to read and understand instructions and informed consent ? Yes No
- 4) Will you be willing to follow study directions and activities ? Yes No
- 5) Do you suffer from Stress ? Yes No
- 6) Do you suffer from or have you been diagnosed with any psychological disorders such as bi-polar, phobias or obsessive/compulsive disorder ? Yes No
- 7) Are you presently taking an herbal formula for anxiety, stress or insomnia ? Yes
No
- 8) Are you now or have you ever taken the formula Bupleurum and Dragon Bone (Jia Wei Chai Hu Long Gu Mu Li Tang) ? Yes No
- 9) Are you presently taking prescription drugs for either high or low blood pressure, depression, anxiety or insomnia ? Yes No
- 10) Are you presently or have you ever taken anti-psychotic or anti-seizure prescription drugs ? Yes No
- 11) Are you pregnant or nursing ? Yes No
- 12) Are you presently receiving acupuncture treatments? Yes No

Appendix C: Oral Presentation

Oral Presentation

Hello,

My name is George Lamoureux and I am the doctoral student and primary researcher conducting this study.

You have all been pre-screened and you are eligible to volunteer for this study. I will now read through the Waiver of Liability and Hold Harmless Agreement and Informed Consent form with you to be sure you understand the study and what is being asked of you.

(Reads through the Waiver of Liability and Hold Harmless Agreement and Informed Consent)

Are there any questions? Does everyone understand the two forms?

You may now sign and date the Waiver of Liability and Hold Harmless Agreement and Informed Consent.

I will now verify that both forms have been signed.

Please place both documents in the manila envelope provided to you.

You may now complete the Life Questionnaire and Perceived Stress Scale.

When you have completed both of the questionnaires, please place both into the manila envelope you were provided and seal the envelope. Once you have sealed the envelope, you may return it to me and I will then distribute the herbal formula and the Daily Dosing Log to you. You will then have completed your first session and you are free to leave.

Thank you for your participation.

Appendix D: Waiver of Liability and Hold Harmless Agreement

WAIVER OF LIABILITY AND HOLD HARMLESS AGREEMENT**FOR GEORGE LAMOUREUX RESEARCH STUDY**

I, _____ am over 18 years of age, fully competent, and eligible to participate in the above named research study. I recognize that I am not required to participate in this research study and choose to do so of my own free will. I recognize that inherent risk is involved in my participation in this research.

I understand that this research may involve the risk of physical and/or psychological injury and death. I voluntarily assume all such risk of personal injury, including death that I may sustain as a result of participating in this research, whether caused by me, the principal investigator, Yo San University, its officers, agents or employees and/or Board of Directors for any such injury.

I FURTHER AGREE AND INDEMNIFY AND HOLD HARMLESS, The principal investigator, Yo San University, its officers, agents and employees and/or Board of Directors from any loss, liability, damage or costs, including court costs, attorneys fees and medical costs that may incur due to my participation in this research study.

I intend to bind other members of my family, my heirs and assigns to this Waiver of Liability and Hold Harmless Agreement.

I have read this document before signing it; I have had an opportunity to consider its meaning, and I understand the document and sign it voluntarily as my own free act and deed.

Printed Name

Signature/Date

Appendix E: Informed Consent

INFORMED CONSENT

This study is being conducted as part of a doctoral research project. George J. Lamoureux is the primary student investigator for this study.

Contact Information

George J. Lamoureux

Yo San University

13315 W. Washington Blvd.

Los Angeles, Ca. 90066

Tel: 213-873-4488

Email: georgel@jingherbs.com

Purpose of This Study

You are being asked to participate in a research study to investigate the effect of an herbal formula known as Bupleurum and Dragon Bone (*Jia Wei Chai Hu Long Gu Mu Li Tang*) on stress.

George J. Lamoureux is conducting this research as part of his doctoral degree program specializing in healthy aging and longevity at Yo San University in Los Angeles, California.

Procedures

You will be asked to listen to a short oral presentation. You will be asked to complete a Life Questionnaire. You will be asked to sign the Waiver of Liability and Hold Harmless Agreement and an Informed Consent. You will be asked to complete a 14 item questionnaire. You will be asked to take the herbal formula for a period of 30 days and maintain a daily dosing log, after which, you will be asked to retake the 14 item questionnaire.

It is anticipated that the total amount of time you will be asked to invest in this study over the course of thirty days is about 8 hours.

Possible Risks

The herbal formula Bupleurum and Dragon Bone has a long and safe history of use. Any substance that is ingested holds inherent risks, although unlikely, the possible side effects of this herbal formula include; dry mouth, loose stools, headache, bloating, cramps, dizziness, light-headedness, feeling warmer than usual, and nausea. It has also been noted that this formula may reduce the effects of antibiotics. The participant assumes all liability in taking this herbal formula.

Possible Benefits

It is the hope of the researcher that the herbal formula may reduce the level of stress in the participant and improve his/her quality of life. It is also hoped that the participant will become aware of the alternative treatments that classical Chinese medicine and herbal formulas have to offer in healthcare.

Financial Considerations

Participants will receive a total honorarium of \$50.00 each for time and travel at the completion of the study having completed all aspects of and activities of the research.

Treatment for Adverse Events

If after ingesting the formula, the participant experiences any unforeseen discomfort, the participant should discontinue the herbal formula immediately. In the event that the reaction becomes serious, the participant is advised to seek immediate medical help or to call 911. In this case, the participant should contact the researcher at the earliest convenience to report the adverse event.

Neither George J. Lamoureux nor Yo San University will provide you with long-term medical treatment or financial compensation except as may be provided through your employer's insurance programs or through whatever remedies are normally available by law.

Confidentiality

Your identity in this study will be treated as confidential. Results of the study, including all collected data, may be published in my dissertation and in possible future journal articles and professional presentations, but your name or any identifiable references to you will not be included. However, any records or data obtained as a result of your participation in this study may be inspected by persons conducting this study or Yo San University's Institutional Review

Board, provided that such inspectors are legally obligated to protect any identifiable information from public disclosure, except where disclosure is otherwise required by law or a court of competent jurisdiction. These records will be kept private in so far as permitted by law.

The data collected for this study will be retained in a secured and locked location for a minimum of three years as required by the IRB and then destroyed.

Termination of Study

You are free to choose whether to participate in this study. You may choose to withdraw from the study or to decline to answer any questions at any time. You will not be penalized or lose any benefits to which you are otherwise entitled if you choose not to participate or choose to withdraw. All data collected on, about, or by you will be destroyed and not used in the data analysis or writing of the findings if you choose to withdraw.

Resources

Any questions you may have about this study will be answered by George J. Lamoureux, Yo San University, 13315 W. Washington Blvd., Los Angeles, Ca. 90066 Telephone: 213-873-4488, Email: georgel@jingherbs.com or, Dr. Larry Ryan, Yo San University, 13315 W. Washington Blvd., Los Angeles, California 90066. Telephone: 310-577-3000, Email: lryan@yosan.edu.

Any questions you may have about your rights as a research subject will be answered by the IRB Coordinator, Yo San University, Telephone: 310-577-3000, Email: irb@yosan.edu.

Appendix F: Life Questionnaire

Appendix G: Perceived Stress Scale

PERCEIVED STRESS SCALE

	Never	Almost never	Sometimes	Fairly often	Very often
	1	2	3	4	5
1. In the last month, how often have you been upset because of something that happened unexpectedly?	0	0	0	0	0
2. In the last month, how often have you felt that you were unable to control the important things in your life?	0	0	0	0	0
3. In the last month, how often have you felt nervous and "stressed"?	0	0	0	0	0
4. In the last month, how often have you dealt successfully with day to day problems and annoyances?	0	0	0	0	0
5. In the last month, how often have you felt that you were effectively coping with important changes that were occurring in your life?	0	0	0	0	0
6. In the last month, how often have you felt confident about your ability to handle your personal problems?	0	0	0	0	0
7. In the last month, how often have you felt that things were going your way?	0	0	0	0	0
8. In the last month, how often have you found that you could not cope with all the things that you had to do?	0	0	0	0	0
9. In the last month, how often have you been able to control irritations in your life?	0	0	0	0	0
10. In the last month, how often have you felt that you were on top of things?	0	0	0	0	0
11. In the last month, how often have you been angered because of things that happened that were outside of your control?	0	0	0	0	0
12. In the last month, how often have you found yourself thinking about things that you have to accomplish?	0	0	0	0	0
13. In the last month, how often have you been able to control the way you spend your time?	0	0	0	0	0
14. In the last month, how often have you felt difficulties were piling up so high that you could not overcome them?	0	0	0	0	0

Appendix H: Daily Dosing Log

DAILY DOSING LOG

DAY	AM	PM	DAY	AM	PM
1	—	—	16	—	—
2	—	—	17	—	—
3	—	—	18	—	—
4	—	—	19	—	—
5	—	—	20	—	—
6	—	—	21	—	—
7	—	—	22	—	—
8	—	—	23	—	—
9	—	—	24	—	—
10	—	—	25	—	—
11	—	—	26	—	—
12	—	—	27	—	—
13	—	—	28	—	—
14	—	—	29	—	—
15	—	—	30	—	—

Appendix I: Tongue and Pulse Diagnosis

TONGUE AND PULSE DIAGNOSIS

Tongue Body:

Color:

Shape:

Tongue Coating:

Color:

Thickness:

Distribution:

Tongue Moisture:

Normal

Wet

Dry

Pulse

Right: Cun

Guan

Chi

Left: Cun

Guan

Chi

General impressions (if any):

Appendix J: Curriculum Vitae of George J. Lamoureux

George J. Lamoureux, MATCM, Dipl. Ac. NCCAOM

533 S. Los Angeles Street, Suite 502

Los Angeles, Ca. 90013

Phone: 213-873-4488

Email: georgel@jingherbs.com**Professional Experience**

Jing Herbs: CEO	2008-Present
<ul style="list-style-type: none"> ❖ Lead the development of company vision ❖ Oversee implementation of long and short term goals ❖ Ensure expenditures are within authorized budget ❖ Ensure company maintains standards and ethics ❖ Ensure company is appropriately organized and staffed ❖ Develop herbal formulas ❖ Conduct herbal consultations 	
Dr. Tea's Tea Garden & Herbal Emporium: Director of Herbal Programs	2006-2008
<ul style="list-style-type: none"> ❖ Ran herbal program ❖ Hire, Fire and maintain staff ❖ Conducted training of herbalists ❖ Conducted consultations 	
Tea Garden and Herbal Emporium: Senior Herbalist/ Board of Directors	2004-2006
<ul style="list-style-type: none"> ❖ Hire, Evaluate, Support Executive Directors ❖ Developed company policy ❖ Accepted fiduciary responsibility ❖ Developed strategic plans ❖ Conducted herbal consultations ❖ Advised herbalists 	
Senior Herbalist/ Vice-President Operations	2002-2004
<ul style="list-style-type: none"> ❖ Provided overall direction to operational activities ❖ Formulated policy ❖ Optimized work flow ❖ Conducted performance reviews 	

- ❖ Conducted herbal consultations
- ❖ Advised herbalists

Senior Herbalist/ Store Manager**1997-2002**

- ❖ Oversaw hiring, firing and maintaining staff
- ❖ Managed daily sales receipts
- ❖ Managed employee payroll
- ❖ Managed stock inventory
- ❖ Advised herbalists

Senior Herbalist**1995-1997**

- ❖ Conducted more complex consultations
- ❖ Approved herbal programs
- ❖ Advised herbalists

Herbalist**1994-1995**

- ❖ Conducted herbal consultations
- ❖ Constructed herbal programs
- ❖ Taught Three treasures concepts

Apprentice Herbalist**1993-1994**

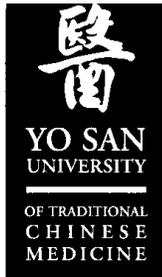
- ❖ Assisted herbalists and Senior herbalists
- ❖ Made tonic elixirs
- ❖ Greeted customers and talked about Three Treasures

Education**University of Connecticut: B. A. Degree****1968-1972****Yo San University: MATCM Degree****1993-1997****Yo San University: Doctoral Candidate****Present**

Certifications

NCCAOM: Certified in Acupuncture and Traditional Chinese Medicine	Active
International College of Medical Qigong: Certified Medical Qigong Practitioner	2012
New York State Acupuncture License	2014

Appendix K: Copy of the Institutional Review Board Approval Letter



June 24, 2013

George J. Lamoureux, Dipl.Ac.,NCCAOM
533 S. Los Angeles St., Suite 502
Los Angeles, CA 90013

Dear George,

Your revised research proposal has been approved, with no additional recommendations effective through March 31, 2014.

Should there be any significant changes that need to be made which would alter the research procedures that you have explained in your proposal, please consult with the IRB coordinator prior to making those changes.

Respectfully,

A handwritten signature in black ink, appearing to be 'Shelley Cerny', with a long, sweeping underline that extends to the right.

Shelley Cerny, L.Ac
IRB Coordinator