Workplace stress, mindfulness based stress reduction (MBSR) and gas discharge visualization (GDV): Innovative practical measurements in Organization Development (OD) and Employee Wellness

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We certify that we have read this dissertation and approved it as adequate in scope and quality. We have found that it is complete and satisfactory in all respects, and that any and all revisions required by the final examining committee have been made.

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Dedication

This dissertation is dedicated with eternal love to my husband, Pär, and my children, Vera and Markus.

A father's wish, a daughter's promise, a dream fulfilled…in loving memory of my dad.

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Abstract

Employee stress is a current costly business challenge affecting profits, productivity, attrition, engagement, and overall wellbeing of employees. Furthermore, the effects of stress at work are a pressing concern among business leaders and scholar practitioners. Mindfulness based stress reduction (MBSR) meditation is an intervention that has been proven to reduce stress. However, assessments used to measure employee stress and intervention effectiveness remain unchanged and are not representative of the modern workforce population.

This study used a mixed methods convergent design to test an innovative stress measurement, gas discharge visualization (GDV), in conjunction with free writing related to qualitative self-reported perceived stress, as well as the effectiveness of the guided breathing meditation from an MBSR intervention in a field study for 3 consecutive months for 2 different company work teams; 1 workgroup within a F500 company and a second workgroup within a start-up company.

The quantitative findings indicated mixed results. For some months the paired *t* test did not show the data were statistically significant. However, for some months the paired *t* test did indicate a reduction in employee stress. Therefore, the data are inconclusive as to a definitive answer if the MBSR was truly effective or not. The qualitative analysis suggests that perceived stress is individualized and that coping skills used to address stressors are either favorable or adverse. The converged quantitative and qualitative analysis indicated mixed results. The first analysis was inconclusive. However, the second and more in-depth analysis showed a strong, statistically significant correlation.

Key words: workplace stress, occupational stress, stress, stress history, Hans Selye, Richard Lazarus, Walter Cannon, Konstantin Korotkov, Jon Kabat-Zinn, stress surveys, stress measurements, gas discharge visualization, GDV, human biofield, human energy field, biofield, mindfulness, stress intervention, stress management, organization development, integrative health, employee wellness, employee wellbeing, integrative wellness, energy psychology, meditation, breathing, workplace wellness, John Creswell mixed methods design, mixed methods methodology.

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Chapter 1: Introduction to the Research

In an intense global economy, business leaders and organization development (OD) researchers and practitioners are inundated with complex business problems. Challenges range from developing innovations to reducing expenses while increasing performance and profitability. A common business practice to overcome such challenges involves workforce reduction; the remaining employees are then required to perform their job duties with added responsibilities and fewer resources, which leads to employee stress (Channuwong, 2009; Kohler & Munz, 2006; LeFevre, Kolt & Matheny, 2006; Raitano & Kleiner, 2004; Mulki, Jaramillo, & Locander, 2008; Randall, Nielsen & Tvedt, 2009; Stein, 2001).

Meaning of Stress

Stress means different things to different people; therefore, there are several definitions of the term. Stress researcher Hans Selye (1974) defined stress as "the nonspecific response of the body to any demand made upon it" (p. 14). Every demand placed on the body creates a nonspecific demand to adjust and adapt to the problem, resulting in an individual reacting to the specific demand, which requires a second reaction of adaptation. These reactions involve both physical as well as emotional reactions. The National Institute for Occupational Safety and Health (NIOSH) defined job stress as "the harmful physical and emotional responses that occur when the requirements of the job do not match the capabilities, resources, or needs of the worker" National Institute for Occupational Safety and Health [NIOSH], 1999, p. 7). Stress at work leads to a variety of consequences for both the employee and the organization. In a 2011 study conducted by The American Psychological Association, 70% of Americans

indicated that work was a significant source of their stress: a consistent finding of the past 5 years (American Psychological Association [APA], 2011). Another study conducted by NIOSH (1999) showed that 40% of employees indicated their jobs were very or extremely stressful.

Global and Financial Issues

Just as in the United States, workplace stress is a common problem worldwide. While the United States and the Netherlands place more work demands on employees requiring longer working hours (Kenny & Cooper, 2003), countries such as Canada and the United Kingdom are finding that stress is a major contributor to employee disease, depression, and injury, and lowered company productivity (Price, 2004; Ryan & Watson, 2004). In a stressful work environment, employees develop a negative attitude toward their work and experience decreased motivation, performance, and efficiency. Employee reactions to stress may include physical ailments, psychological effects, and unhealthy coping habits. Examples include high blood pressure, heart disease, higher cortisol levels, escalated conflict, depression, and excessive consumption of alcoholic beverages. Early signs of workplace stress include headache, insomnia, difficulty concentrating, short temper, and upset stomach. Workplace stress also results in organization effects such as absenteeism, presenteeism, turnover, and increased sick leave.

The financial impact of workplace stress also affects businesses all around the globe. Workplace stress is estimated to cost United States organizations more than $300 billion dollars every year in lost productivity, absenteeism, turnover, and medical, legal, and insurance costs (Rosch, 2001). In Canada, the issue of workplace stress costs 6 billion Canadian dollars annually (Price, 2004). Further, the United Kingdom reports that

an estimated 200 million working days each year are lost due to illnesses caused by workplace stress (Ryan & Watson, 2004). Additional financial effects include employee lawsuits for workplace stress with monetary awards (Rosch, 2001), an increase in workers' compensation, and an increase in disability claims (NIOSH, 1999). These and other reports suggest that workplace stress is a growing global epidemic.

Business Responses to Stress

To address workplace stress, many organizations have responded by integrating stress management interventions (SMIs) such as mindfulness-based stress reduction (MBSR) programs (Kabat-Zinn, 1990) and relaxation techniques such as breathing practices, meditation, guided imagery, and yoga (Feldman, Greeson & Senville, 2010; Schure, Christopher & Christopher, 2008). The purpose of these programs is to improve the workplace environment and reduce employee stress. Although they have been proven effective and continue to gain interest, these programs are not part of current standard business practices. One proposed reason for this is that executives require interventions to be effective and inexpensive, and require low time investment with an immediate change (Applebaum, 1975; Burke, 2008; Kotter, 1996). Secondly, in order to measure effectiveness, today's researchers, clinicians, human resource professionals, and OD consultants use traditional quantitative surveys and questionnaires that were developed and validated 15-25 years ago (Beck, Ward, Mendelson, Mock, & Erbaugh, 1961; Brantley, Waggoner, Jones & Rappaport, 1987; Cohen, Kamarck & Mermelstein, 1983; Maslach & Jackson, 1981; Rosenberg, 1965; Vitaliano, 1985). While they are practical to use within business environments, these survey measurements are outdated and do not represent today's workforce, organization, and global economy.

Stress research spans over 9 decades, originating during World War I with studies addressing stress disorders of front line soldiers (Selye, 1956). To date, most clinical research includes quantitative studies with few workplace quantitative studies and even fewer qualitative studies (Bellarosa & Chen, 1997; LeFevre et al., 2006). Over the years, stress research has resulted in testing a variety of SMIs, yet without the development of new measurement assessments and neither representing the modern workforce nor producing significant positive business changes. Thus, the need for an OD intervention in this field is undeniable.

Background of the Problem

In the 1970s, NIOSH initiated epidemiological studies on the effects of organization work factors. As a result of these studies, NIOSH recognized occupational stress or job related stress as a workplace safety and health hazard. At some point, all individuals experience stress, both in and beyond the workplace. However, employees respond to stress at work in a variety of ways. Many employees show up for work, but do not work to their full capacity (Willingham, 2008). Other employees decide that the stress is too much and quit voluntarily. The American Psychological Association (2007) reports that "fifty-two percent of employees report that they have considered or made a decision about their career such as looking for a new job, declining a promotion or leaving a job based on workplace stress" (p. 11). Some former employees start their own businesses and remove themselves from the employee workforce population altogether (Hewlett & Buck Luce, 2006).

Kenny and Cooper (2003) conducted a literature review of occupational stress interventions focused on exploring conceptual frameworks for research and included

current field research. Their findings revealed no field research utilizing scientific methodology in this area. Another finding was that intervention programs developed by organizations varied by objective, structure, and participating employee groups. The lack of best practices, standards, methodology, and evaluations supports the growing need for an OD change intervention with respect to reducing work-related stress.

An OD intervention. Few researchers have proposed the need for an organization-wide intervention to address occupational stress. Newman and Beehr (1979) reviewed human resources and organizational effectiveness models and found that the theoretical models proved ineffective due to the fact that they were not applied in the real-world context of the organization. Other researchers stress the need for a change intervention with special emphasis on the organization's culture (Applebaum, 1975; Barclay, 2010; Burke, 2008; Kohler & Munz, 2006; Wasylyshyn, 2001). These researchers reflect a view that developing an OD intervention to address stress in the workplace through the organization's culture is at the very early stages of influence with leadership to incorporate new policies and standard practices.

Some companies such as Google have proactively initiated SMIs available for all employees and not just the senior leadership team. Forward-thinking business and health leaders such Warren Buffet and William Kizer, Sr. have devoted their careers supporting a non-profit organization, Wellness Council of America (WELCOA), as a national resource to other businesses for "building and sustaining results-oriented worksite wellness programs" (Wellness Council of America [WELCOA], 2008, p. 10). Wellness programs and workplace wellness address a myriad of challenges and include SMIs, work-life balance programs, smoking cessation, dependent care assistance, nutrition

instruction, and exercise classes (Azzone et al., 2009). Patrick Geraghty, President of Blue Cross Blue Shield of Minnesota stated, “We have to make wellness something that businesses are focused on because we spend so much time in the workplace” (P. Geraghty, personal communication, July 13, 2011). Although promising, these business initiatives and leader perspectives are outside of the norm and are not part of standard business operational practices.

Intervention methods and assessments. According to research findings, SMIs are a common method by which to address employee stress within organizations. These interventions include a variety of techniques such as deep breathing, listening to music, guided imagery, and formal training in Jon Kabat-Zinn’s MBSR (Bellarosa & Chen, 1997). While several intervention types exist and options continue to increase, assessment tools to measure intervention effectiveness remain outdated, and modern and newly developed assessments are nonexistent.

The continued use of outdated assessments poses many challenges to the validity of tools used to assess employee stress and stress interventions. For over 90 years, researchers, business leaders, and OD practitioners have continued to use questionnaires and surveys, clinical instruments, and laboratory tests for data collection, diagnosis, and assessment of workplace stress. However, the most frequently used questionnaires, surveys, and clinical measurements were created and validated over 25 years ago (Centre for Studies on Human Stress, 2012). Some questionnaires still in use were developed almost 3 decades ago through grants provided by the National Institutes of Health (NIH) and NIOSH. Other one-time-use questionnaires contain outdated benchmarking data and survey questions, and are unrepresentative of today’s workforce population.

There is a global need to improve the work environment, address and reduce employee stress, develop new assessment tools that reflect the modern workforce and modern businesses, and offer practical solutions to business challenges. Historical research and practices offer decades of opportunities yet lack any development in these areas, resulting in using the same practices and assessments while expecting different results: Albert Einstein's definition of insanity.

Business leaders are desperately searching for something new to help with organizational challenges other than old theories and techniques wrapped in a new package (Brookfield, 2005; Morgan, 2006; Weisbord, 2004). Moreover, OD pioneer Chris Argyris (1975) claimed that individuals tend to play it safe by not violating or questioning the status quo. Argyris proposed that developing new ways of doing things such as effective problem solving, learning, and theories of action occur only when individuals challenge the existing state of affairs.

These challenges present several questions. Why do researchers, leaders, and practitioners keep using the same tools to measure the same variables but expect different results? When will someone take a risk and do something different? As a result of these challenges and ensuing questions, a need presents itself for contemporary work-related stress research using innovative methodology and methods.

Problem Statement

Research on stress, stress within organizations, SMIs, stress reduction techniques, and measurements to assess stress yields varied and minimal results. Awareness of the concept and impact of stress is documented as early as post-World War I; these reports primarily consist of clinically conducted stress research. Acknowledgement of the

severity of on a global level as well as in organizations is conclusive. Further, research supports the effective results of stress reduction techniques. However, one of the gaps in previous research is the usage of out-of-date assessments to measure intervention effectiveness. These previously validated assessments represent a population group and business challenges from yesteryear. Also, these measurements do not include variables such as global economy and workforce diversity. Additional research needs to be done on new assessments. Yet again, there is a total lack of quantitative and qualitative research conducted in the workplace using modern assessments with current and valid metrics.

Purpose of the research. One purpose of this research study is to introduce a new practical instrument, gas discharge visualization (GDV), to assess employee stress in the workplace. Invented by Russian biophysicist, Dr. Konstantin Korotkov, GDV was originally used to assess stress and performance of cosmonauts and athletes in the former Soviet Union (Korotkov, 2002). The GDV digital camera and propriety software measure both traditional variables of physical and emotional stress and include a new variable: the human energetic biofield. In 1994, at the U.S. NIH, a panel of scientists on manual medicine concerned with alternative and complementary medicine coined the term *biofield* (National Institutes of Health [NIH], 1994; Rubik, 2004) to describe the biologic field of subtle energy that "permeates the physical body, also extends outward from the body for several inches" (NIH, 1994, p. 3). Some scientists, researchers, and practitioners claim that when the biofield is out of balance, the physical body and emotional state is also out of balance (Benor, 2004; Brennan 1988; Gerber, 2001; Koopsen & Young, 2009; Korotkov, 2002; NIH, 1994; Rubik, 2004) and can be influenced with biofield practices (Kemper et al., 2011).

The term *biofield* is recognized by people and cultures all over the world in a variety of culturally equivalent terms, including: Ki (Japan), Doshas (India) Prana (India), Qi (China), Bioenergy (US/England), Subtle Energy (US/England), Tane (Hawaii), Mulungu (Ghana), Human Energy Field (Russian Federation), and Oki (Huron; Koopsen & Young, 2009; Korotkov, 2000; NIH, 1994). The term biofield is accepted by the U.S. NIH's National Library of Medicine's PubMed database as subject heading search term. Furthermore, the National Library of Medicine and the National Center for Complementary and Alternative Medicine (NCCAM, a division of the NIH) partnered to create a subset of the PubMed database entitled the CAM Database for Complementary and Alternative Medicine. At the time of this research, the CAM database contained over 462,000 peer-reviewed journal articles dating back to 1966, including 25,252 articles matching the term "bioenergetic," 35,875 including the term "stress," 595 including the term "energy field," 311 including the phrase "breathing exercise," and 175 including the phrase "mindfulness based stress reduction" (National Center for Biotechnology Information, 2013).

For over 8 years, the NIH and the NCCAM have conducted research on and awarded grants to study the human biofield using non-traditional and Western assessment instruments and interventions (Rubik, 1994, 2004; Schwartz, 2007). Studies involving the biofield include biofield therapies such as stress reduction (Korotkov, 2011a), deep breathing, therapeutic and healing touch, yoga/tai chi/qi gong (Kemper et al., 2011), acupuncture, acupressure, and Reiki (Rubik, 2004). GDV was one of the assessment instruments used in those studies (Rubik, 2004; Schwartz, 2007). Major U.S. academic institutions conducting human biofield and stress research use GDV cameras as an

assessment instrument (Rubik, 2004; Korotkov, 2011a). Furthermore, GDV cameras are part of hundreds of clinical stress studies in countries such as the Netherlands, United Kingdom, Russia, Sweden, and Canada (Korotkov, Matravers, Orlov & Williams, 2010; Korotkov, 2006, 2011a). However, up until now, no researchers have used GDV to assess workplace stress and the effectiveness of stress interventions in an actual business setting.

A second purpose of this research is to explore correlational ties between GVD quantitative measurements and other captured qualitative data to assess workplace stress. While GDV is a clinically proven instrument to measure stress and has received a U.S. Patent as a stress instrument (Korotkov, 2011b), thus far it has not been used to measure stress in the workplace.

A third purpose of the research study is to measure the effectiveness of an SMI using a mixed methods design methodology. A mixed methods research design is a procedure for collecting, analyzing, and mixing both quantitative and qualitative research and methods in a single research study to understand a research problem (Chatterji, 2005; Creswell & Plano Clark, 2007; Creswell & Zhang, 2009). The mixed methods design employed for this research study is a concurrent triangulation design with a convergence model variance (Creswell, 2009; Creswell & Plano Clark, 2007). The quantitative approach is a quasi-experimental pretest-posttest and interrupted time series design, whereas the qualitative process is a phenomenological design containing a post intervention qualitative questionnaire and a follow-up interview.

A mixed methods methodology combining a quasi-experimental method with a phenomenological approach involves conducting quantitative and qualitative research within a real world context (Campbell & Stanley, 1963; Ross & Morrison, Shadish, 2002;

Shadish, Cook, & Campbell, 2002). This process allows the researcher to study a natural phenomenon and participants' lived experiences (Creswell, 1998). Mixing both methodologies offsets any inherent weaknesses within each methodology if it were used as a standalone method (Creswell, 2009).

This study specifically examines two full time employee workgroups within two different for-profit businesses during a period when increased stress is likely, such as during seasonality or a product and service launch. The participants will use a stress management technique once per month for 3 consecutive months with a pre-post intervention GDV camera measurement, followed by a post intervention qualitative self-reported free write as well as a qualitative follow-up interview.

Research questions. The research questions for this study are as follows:

1. What effect does a 10-minute stress management intervention, used once per month for 3 consecutive months have on employee stress among members of a work team within the workplace?
2. How do the GDV camera stress measurements compare with qualitative, self-reports of stress?

Significance of the Study

Addressing employee stress is a challenging business problem. If business leaders choose to ignore employee stress and workplace causes of stress, organizations may face even greater consequences. Organizations already face losses exceeding $200 billion dollars a year in lost productivity, increased compensation claims, litigation claims, greater turnover, and higher healthcare costs. In fact, a majority of employee doctor visits are related to workplace stress (American Psychological Association [APA], 2011).

Therefore, business leaders cannot afford to make decisions regarding employee stress based on the status quo.

In addition to employee stress, assessments used to measure stress and determine the effectiveness of SMIs are outdated. Years ago these assessments were valid; however, used today, these assessments provide false positive and outdated information to business leaders. In order for business leaders to make sound business decisions regarding stress change initiatives, researchers and practitioners need to provide current and valid data reflecting today's employee workforce and modern business challenges. Therefore, in order to conduct valid research with sound business change recommendations, OD practitioners and researchers cannot afford to use outdated assessments and measurements.

The findings of this study may provide a modern alternative to measuring employee stress and the effects of a change intervention in the actual workplace. Likewise, the study has the potential to introduce the new measurement of GDV to OD practitioners and researchers as a valid and practical assessment. Furthermore, the study could be beneficial by providing a solution to a global business problem that is practical, up-to-date, inexpensive, and effective.

Dissertation Layout

Chapter 2 provides a literature review of current information about stress, employee and occupational stress, the history of stress, the effectiveness of SMI techniques, and measurements used for assessing stress. Gaps in the current understanding of methods used as measurements as well as with researchers and practitioners are highlighted. Chapter 3 provides an explanation of the research

methodology and methods outlined in this study. Chapter 4 presents the research findings and collected data. Chapter 5 includes a discussion of the findings and collected data.

Definitions

Human energy biofield. A subtle body possessing various energetic anatomical structures connected to the emotional body surrounding the physical body, including electromagnetic fields of energy and information.

Stress management techniques. A specific instruction or exercise targeted to reduce stress in a person.

Stress management interventions (SMIs). A specific stress management technique that is applied, used, and/or performed: an individual puts the technique into practice.

Gas Discharge Visualization (GDV). Based on the Kirlian effect, GDV uses modern optics, electronics and computer processing to analyzing weak photon emissions from diverse organic subjects simulated by a pulsed electromagnetic field.

Naturally occurring stress environment. For this study, a naturally occurring stress environment within a business is defined as an organization experiencing non-synthetic stress induced by business events. Examples include peak seasons such as holiday shopping months in the retail industry, new product development, new product launch, and fashion week in the health, beauty, and fashion industries.

Chapter 2: Literature Review

Introduction

An extensive literature review revealed several areas that have a direct bearing on the current research study. This section offers a synthesis of the findings: a review of the history and theories of stress, types of stress, effects of stress, organization responses to stress, SMIs, and stress measurements.

History and Stress Theories

For over 9 decades, studies of stress have been gaining popularity within the behavioral, social, and health sciences. The term stress originated from the field of physics to denote how manmade structures must resist deformation caused by external forces. In physics, stress referred to the external pressure or force applied to a structure, while strain denoted the resulting internal distortion of the structure (Hinkle, 1974). Borrowing the term from physics to apply it to the behavioral sciences, Hans Selye (1974) adopted the term stress and changed its usage to mean circumstances that place physical or psychological demands on an individual. Historically, the three main theorists of stress are physiologist Walter Cannon, endocrinologist Hans Selye, and psychologist Richard Lazarus.

Walter Cannon: The fight or flight response. Physiologist Walter Cannon (1939) was the earliest researcher and theorist to focus on the body's reactions to stress. Cannon conceptualized the body's reaction to stress as a *fight or flight* response, in which the body reacts to stress by either confronting or fleeing from a threatening situation. Cannon's fight or flight response was revealed by an increase in psychophysiological activities such as an increase in heart rate, blood pressure, pulse rate, and adrenaline.

Cannon stated that the fight or flight response represented a continued struggle for organisms' ongoing survival; organisms that could adjust, restore their normal state, and maintain stability were more likely to survive than other organisms.

Hans Selye: General adaptation syndrome. Hans Selye (1936, 1956, 1964, 1974) contributed significantly to stress research by studying the response to various types of demand made on the body. He concluded that most diseases were a direct result of the physical body's response to stress, specifically due to excessive, inadequate, or dysfunctional adaptive reactions to stressors. Selye (1956) termed these conditions "diseases of adaptation" (p. 66) and claimed that choosing the wrong reaction is equivalent to death by biological suicide (Selye, 1975).

Selye's (1936) stress theory of General Adaptation Syndrome (GAS) is derived from experimental science. He conducted a series of animal studies in which he observed applied stimulus events and their effects. In particular, Selye recorded observations of short-term and long-term bodily reactions resulting from a variety of provoked stimuli that produced three types of reactions in three distinct stages: the alarm reaction, the resistance/adaptation stage, and exhaustion.

Selye (1956, 1974) suggested that the alarm reaction is the body's initial response to a stressor as a means to defend itself: for example, an observed animal experienced stress resulting from various imposed stressors, that is, external forces impinging on the body causing an immediate reactive change. If the animal reacted in shock, using resources to fight the stimuli or to escape the stimulus, this was noted by a defensive process to the body and identified as the *alarm* response. The alarm stage was characterized by increased adrenaline and corticosterone levels, blood pressure, heart

rate, and respiration, as well as decreased immune response. The second stage, resistance, follows the alarm reaction if the simulation stressor treatment continues; the animal becomes resistant to the stressor, and shock symptoms disappear. The stage of exhaustion follows with continued exposure to the stressor. If the adverse stimulation or stressor treatment persists and the animal can no longer resist the simulation, the prolonged exposure to the stressor will cause the animal to lose its resistance and give way to the state of exhaustion. In this final stage, Selye's work showed increased vulnerability to disease, almost complete elimination of immune system function, and irreversible tissue damage or defense actions to the animal. If the stimulation continued beyond the state of exhaustion without stopping, the animal would eventually die.

From his research, Selye (1976) created another definition of stress as "a state manifested by a syndrome which consists of all the nonspecifically induced changes in a biological system" (p. 64). An outcome of his work is the concept that the stressor came first and then the experience of stress.

Richard Lazarus: Three stage model. Another prominent stress researcher, Richard Lazarus, presented a different approach to stress theory. Lazarus (1966) investigated stress from a psychological perspective and created a stress model focusing on an individual's appraisal or perception of a specific threatening situation as the identified source of stress. Lazarus' three stage model includes a primary appraisal identified by an individual's initial perception of the threatening situation, a secondary appraisal of an individual's resources and options, and a third appraisal of the possible consequences of an individual's reactions and outcome behaviors. Outcome behaviors

consist of two general types: a direct action to change the stressor, or a coping action to change an individual's perception of the situation.

Transactional relationship. Lazarus (1966) also proposed that stress was caused by a transactional relationship between a person and his/her environment as well as his/her understanding of the event. This transactional relationship reflects a person's motives, beliefs, and personal agendas related to an environment that poses harm, threat, or challenges as understood by the person (Lazarus, 1990). Thus, psychological stressors are different for all individuals.

While transaction implies a process, relationship implies a "constantly changing interplay between person and the environment" (Lazarus, 1990, p. 4). The stress relationship is "one in which demands tax or exceed the person's resources" (Lazarus, 1990, p. 3). Lazarus' transactional model includes two units of analysis: appraisal and coping. Appraisal refers to the meaning and evaluation of the event; it is the person's analysis of the threat and proposed harm based on emotional processes of significance and projected outcome of an event. The appraisal process leads to three different kinds of stress: harm, threat, and challenge (Lazarus & Folkman, 1984). Harm refers to a previously experienced psychological damage or loss. Threat is the anticipation of harm. Challenge results from a person feeling confident about mastering particular demands. These different kinds of stress are embedded in emotional reactions, thus illustrating the relationship between stress and emotions.

As an individual evaluates and determines an appraised situation as stressful, coping processes are initiated to manage the troubled person as well as the environment relationship (Lazarus, 1966, 1990; Lazarus & Folkman, 1984). The coping component of

the stress-relevant person-environment transactions refers to the "cognitive and behavioral efforts made by the individual to master, tolerate, or reduce internal and/or external demands and conflicts" (Folkman & Lazarus, 1980, p. 223). These efforts reflect attempts to change the person-environment realities and are often part of a reappraisal process by which events are constantly reevaluated. From Lazarus' research, another definition of stress emerges as "a particular relationship between the person and the environment that is appraised by the person as taxing or exceeding his or her resources and endangering his or her well-being" (Lazarus & Folkman, 1984, p.19).

Psychoneuroimmunology. The growing field of psychoneuroimmunology is focused on the link between stress and disease. Lazarus and Folkman (1984) stated that stress is based on the relationship between the body's integrative systems – primarily the nervous, immune, and endocrine systems – and how the environment, social interactions, an individual's perception of the environment, and an individual's emotional state produce a physical stress response.

Later work. Lazarus (1990) spent over 50 years researching stress. In his later years, he supported research examining the effects of stress as well as exploring life events, daily hassles, and personal emotional reactions to stress. In his later work, Lazarus criticized clinical stress research, the imbalance between clinical research and realistic application, as well as the measurements of stress. He believed researchers should measure beyond stress and include measurements of emotion. Lazarus advocated for a multidimensional exploration of emotions such as anger, anxiety, pride, and compassion. Furthermore, he proposed that this extended research encompass what a person has at stake in life in general, how a person interprets the world and self, and how

harm, threats, and challenges are managed. Lazarus believed this new type of "research on how emotions affect health outcomes can tell us much more than research on stress and health outcomes" (Lazarus, 1990, p. 12).

Types of Stress

Depending on the individual's perception of the stress and its degree of desirability, stress can be mild, moderate, or severe. Also, the duration of time experiencing the stress can be short-term or chronic.

Mild, moderate, and severe. The three degrees of desirability for stress are mild, moderate, and severe (Stein, 2001). Mild stress is commonly identified as the most tolerable; for some individuals, mild stress can be motivating. For example, mild workplace stress can be positive and act as a motivating force to increase employee productivity, meet an immediate deadline, or temporarily work longer hours and meet the demands of the organization. Therefore, for some individuals, the degree of desirability for mild stress is high and the stress can be self-managed. However, other individuals may be vulnerable to mild stress; for them, it can trigger reactions such as anxiety, nervousness, and lower occupational productivity resulting from a low degree of desirability. These individuals may also seek out or need help to regulate and manage this level of stress. The second degree, moderate stress, is commonly associated with an individual experiencing mild stress over an extended period of time, which transforms into moderate stress. Furthermore, individuals perceiving mild stress as motivating may perceive moderate stress as a trigger for emotional and physical reactions. The final degree, severe stress, has the lowest degree of desirability with the strongest effects on individuals, such as depression, ulcers, heart disease, hypertension, and fatigue, as well as

linkage to workplace absenteeism, poorer job performance, and lower job satisfaction (Stein, 2001).

As mentioned earlier, an individual's perception of the degree of desirability of stress affects his/her ability to use and or cope with stress, as does the longevity of the stress. The longevity of stress is identified into two categories: short-term and chronic.

Short-term and chronic stress. As with the effects of stress, people interpret the longevity of stress differently; therefore, stress longevity has unequal significance across individuals. Some research indicates that short-term stress is associated with daily stressful events, life events, or hassles of life (Gruen, Folkman, & Lazarus, 1988; Johnson & Johnson, 2010; Thoits, 1995). Daily stressful events such as highway congestion, changes of weather, or a public speaking event can bring about a temporary moment of stress. These examples illustrate daily stress that is short lived. In contrast, chronic stress is stress over a prolonged or extended period of time: again, interpreted differently by individuals. For example, an individual experiencing the daily hassle of highway congestion everyday for several months may then begin to experience symptoms of emotional and physical effects of chronic stress. The same can be stated regarding ongoing stress in the workplace; what began as a daily hassle can easily convert into chronic stress and lead to emotional and physical effects (Lazarus, 1993) as well as negative consequences for the human energetic biofield (Bundzen, Korotkov, Nazarov, & Rogozkin, 2002; Korotkov, 2002, 2003; Korotkov, Bundzen, Bronnikov, & Logikova, 2005; Korotkov et al., 2010; Korotkov, Williams, & Wisneski, 2004; NIH, 1994; NIH, NCCAM, 2005). Regardless of whether stress is short-term or chronic, its effects impact everyone.

Effects of Stress

Stress affects people differently and people interpret as well as respond to stress differently. Stress is a highly personalized phenomenon; one person's stress can increase motivation, whereas another person's stress can decrease motivation. Some individuals thrive in a hectic environment, almost requiring it for their daily existence. However, others may become extremely upset or apprehensive if they cannot follow a slow, orderly pace, and are suddenly faced with an unexpected change (Rosh & Hendler, 1982). The term *eustress* commonly denotes a *good* stress that can be motivational and improve performance. In contrast, the term *distress* is considered a *bad* stress and is the most familiar form of stress that can be demotivating and lead to a decline in performance. The linkage between stress, employee performance, engagement, and motivation continue to be heavily researched in the modern workplace (Azzone et al., 2009; Bellarosa & Chen, 1977; Kohler & Munz, 2006; Lamontagne, Keegle, Louis, Ostry, & Landsbergis, 2007; Randall et al., 2009; Schure et al., 2008).

Eustress and distress. The distinction between eustress and distress is how an individual perceives and interprets the stressor and chooses to react to it (Selye, 1956, 1964, 1974). Eustress is associated with positive perceptions of and reactions to stressors, whereas distress is primarily the result of negative perceptions of and reactions to stressors (Edwards & Cooper, 1988; Harris, 1970; LeFevre et al., 2006; Nelson & Simmons, 2003). Whether a particular stressor represents eustress or distress is not solely determined by the perception of the stressor alone but also the individual's perception of the stressor's other characteristics such as timing, source, degree to which the individual has control over the stressor, and the degree to which the individual considers the stressor

to be desirable (LeFevre et al., 2006). However, some research indicates that other perceptions of stressors, such as with dispositional stress, are caused by the characteristics of an individual's personality traits. Research on individual differences has not been able to provide a unified theoretical account for the wide range of perceptions and reactions that individuals display during stressful encounters.

Dispositional stress, one type of workplace stress, can take form of task-related stress such as work overload or underutilization (van Dierendonck, Garssen, & Visser, 2005). A second type of workplace stress, situational stress, is derived from organizational sources and the types of stressors encountered as a result of one's role, job description, and job responsibilities. Situational stress can take the form of employee ambiguity as well as an imbalance in person-organization fit.

Physical effects. Physical effects of stress range in degree of severity as interpreted by the individual. Unmanaged stress can result in damaging physical effects. Once the physical effects of stress affect the individual's body, some of these effects can become difficult to manage. Furthermore, stress may lead to or worsen physical disorders and diseases such as heart disease, high blood pressure, gastrointestinal disorders, endocrine disorders, headaches, sweating, tremors, and ulcers (Lazarus, Deese, & Osler, 1952; Selye, 1936; Stein, 2001). Stress is considered a contributor to other physical problems such as obesity, self harm, substance abuse, lung cancer, muscular disorders, and cardiovascular disease (Channuwong, 2009; Feldman et al., 2010; Schure et al., 2008). Furthermore, Selye's (1936) clinical experiments with small animals showed that, over time, chronic stress led to death. Rosch and Hendler (1982) concur with Selye; their research found that chronic stress in humans led to death. At the Penny George Institute

for Health and Healing, cardiologist and vice president Courtney Jordan Baechler (as cited in "How to survive," 2012) claimed that "all diseases are affected by stress" (p. 1), arguing that stress plays a role in any illness where the body is trying to heal itself.

Emotional effects. Emotion-focused effects of stress impact diverse qualities such as motivation, anger, anxiety, and depression. Coping strategies range from favorable coping techniques such as exercise to adverse coping strategies such as consumption of excessive alcohol or unhealthy eating.

Some research findings suggested that emotion-focused coping strategies and emotion-focused SMIs such as meditation training as well as awareness and mindfulness training help to alter the mind's immediate reaction to and symptoms of stress (Johnson & Johnson, 2010; Pearlin, Menaghan, Lieberman, & Mullin, 1981; Stein, 2001). Miller, Fletcher, and Kabat-Zinn (1995) described mindfulness practice as having the capacity to "abate or short-circuit the flight or fight reaction characteristic of the sympathetic nervous system, particularly in stressful or anxiety-producing social situations where it is nonadaptive" (p. 197). For this reason, the ancient practice of mindfulness has received increasingly greater attention as an approach to drive changes in perception and emotional behavior. Another ancient practice of meditation – being aware of and focusing on one's breathing – can increase calm, reduce tension, enhance self esteem, and increase the effectiveness of stress management coping (Stein, 2001). By changing a person's perspective of the appraised situation, an individual is more likely to control and mitigate a negative or unhealthy reaction and maintain a sense of emotional wellbeing. In other words, some research suggests that individuals who believe that they can change their perceptions through self-confidence and mastery are in more control and are

emotionally healthier (Fleishman, 1984; Folkman, Lazarus, Gruen, & DeLongis, 1986). Other research suggests that the ability to coping with stressors is correlated with age, indicating that an increase in emotion-focused strategies is more prevalent among older individuals (Johnson & Johnson, 2010).

Regardless of age, perception, or coping mechanism, emotional stress reactions have been observed to significantly impact an individual's emotional state. For example, increased workload may be an emotional stressor, resulting in the individual experiencing anxiety. Therefore, an individual's reactions to stressful events are in fact more important than the events themselves (Johnson & Johnson, 2010).

Human energetic biofield effects. In addition to the emotional and physical effects of stress, contemporary scientific researchers are discovering new findings related to the energetic effects of stress, including its impact on the human energy biofield. In 1993, the NIH commissioned researchers to conduct empirically-based research on the human energy biofield and acknowledged the existence thereof as a field of energy extending around the human body (Rubik, 2004). Whenever something impacts the human energy biofield, it will also have an effect on a person's physical and emotional states. While new in theory, practice, and belief in Western cultures, ancient cultures in India, China, Russia, Eastern Europe, and the Mediterranean have long acknowledged and researched the human energy biofield and the effects of stress on the human body and emotions (Katchmer, 1993; Korotkov et al., 2010; NIH, 1994; NIH, NCCAM, 2005; Rubik, 2004; Schure et al., 2008; Tiller, 2004).

Researchers exploring the human energy biofield are in consensus with a general definition of the human energy biofield as a subtle energy surrounding the physical body

consisting of various high frequency vibrations (Gerber, 2001; Tiller, 2004). These subtle energies are measureable and photographable by using specifically designed cameras such as the GDV camera (Korotkov, 1995; Korotkov et al., 2010). The GDV camera captures an image of the human physical, emotional, and energetic biofield, "based on the well-known Kirlian effect" (Korotkov et al., 2010, p. 13). Research by Russian biophysicist Konstantin Korotkov (2002) in the human energy biofield and quantum physics resulted in the development of the first GDV camera in 1995.

GDV cameras are currently used in over 39 countries around the world. In 2011, the U.S. Patent Office issued a patent to Dr. Korotkov (2011b) for use of the GDV camera to assess stress in the human body. Moreover, GDV measurements have earned the recognition of specialists in many areas including traditional medicine (Bundzen, Korotkov & Unestahl, 2002), complementary and alternative medicine, professional sports and fitness (Bundzen, Korotkov, Nazarov et al., 2002; Korotkov, 2002), spas and health resorts (Korotkov, 2002), the beauty industry (Korotkov et al., 2010), psychology and psychophysiology (Korotkov, 2002), religious and spiritual centers (Korotkov, 2002; Korotkov, Orlov, & Madappa, 2009), and applied research (Korotkov, 2002, 2011). To date, however, GDV is not used in the applied business environment to measure employee and work group stress.

Conbere and Heorhiadi (2008) introduced a new concept of working with subtle energetic fields and OD practitioners being trained in working with these fields. They suggested practitioners begin working with subtle energy fields as a means to acquire a new set of skills including a new understanding of the self as a practitioner, for individual and group development, and for whole-organization development. This new awareness

and acquired skills can be especially helpful working with groups and conducting OD interventions.

As noted by Cooper (1988), in order to maximize the effectiveness of stress interventions in the workplace, one must direct them at the individual and the organization. If delivered from an OD change perspective, interventions would be comprehensive, addressing the individual, the organizational environment, and the individual-organizational interface (Hurrell, 1995; Kohler & Munz, 2006). The OD approach considers the entire system. This comprehensive view would explore various types of stress related problems and possible interventions, including physical, emotional, and human energetic biofield assessment. However, to date, most subtle energetic and human biofield practices are limited to clinical and hospital settings, focusing on integrative health for oncology, pain management, as well as end of life care.

Responses to Stress

Responses to stress in organizations, governments, and agencies confirm that stress is a global problem. Unlike businesses in the European Union, the United States remains one of the few industrialized nations resisting the need to take necessary actions to better understand and protect workers from occupational stress. Consequently, even though an organization may be aware of and acknowledge stress in the workplace, organizational leaders tend to tolerate, ignore, or deny employee stress as an organizational issue and instead consider it a personal issue. Over time, employee stress and causes of stress become part of the accepted norms, status quo, and organizational culture. In contrast, few organizations and OD researchers in the United States are

challenging the status quo and addressing employee stress through contemporary initiatives (Kohler & Munz, 2006).

Organization response. Recently, the topics of occupational stress and employee stress management have received increased attention from business leaders, government agencies, researchers, and practitioners. These players have been working to identify various theories, models, and practices to mitigate the effects of stress in the workplace. Stein (2001) proposed that organizations should implement stress management programs to increase profits and control worker burnout. Bellarosa and Chen (1997) concurred with Stein's assertion, as their research indicated that organizations make efforts to implement or expand stress management programs to reduce costs associated with stress in the workplace such as increased healthcare spending and workers' compensation, or to avoid the possibility of litigation.

To address employee stress, organizations respond by implementing SMIs. These interventions are typically part of work-life balance and corporate wellness programs within an organization's Employee Assistance Programs (EAPs). However, several challenges arise as a result of responding to employee stress through these programs. First, an SMI presents an added expense. Another challenge is the lack of SMI standards: best practices set forth by business leaders and practitioners. To complicate matters, business leaders and practitioners are unable to come to a consensus as to which SMIs are effective applications (Kohler & Munz, 2006). These inconsistent and disagreeable business practices result in each organization determining its own standards and means to address stress. For example, some organizations may offer an SMI consisting of a single service employee stress questionnaire, while other organizations may offer a variety of

SMI programs such as onsite meditation rooms, massage, and courses in guided breathing exercises. Furthermore, some organizations may offer SMI programs to senior leadership only, whereas other organizations may offer programs to all employees (Azzone et al., 2009; Burns, 1975; Kohler & Munz, 2006; Lamontagne et al., 2007; Randall et al., 2009; Schmidt-Wilk, Alexander & Swanson, 1996).

OD research practitioners Kohler and Munz (2006) proposed that stress management programs should go beyond addressing employee stress and include the employee, the organizational environment, and the employee-organizational interface, thereby encompassing an organizational change intervention to address stress. Mulki et al. (2008) concurred with Kohler and Munz, suggesting that management programs and initiatives should be part of the organization's culture, including practices, procedures, norms, and values. While these researchers' positions are holistic in nature, most organizations respond to workplace stress by implement SMIs that vary across business unit and businesses. Furthermore, these interventions are commonly decentralized as opposed to an integrated, organization-wide program embedded within an organization's culture with consistent availability to all grade levels of workers (Azzone et al., 2009; Burns, 1975; Kohler & Munz, 2006; Lamontagne et al., 2007; Randall et al., 2009; Schmidt-Wilk et al., 1996).

Global government response. Stein (2001) proposed that government public health agencies became involved in stress management programs to protect the public from disease and injury, as well as protect employees from abuse in the workplace. While Stein's research is of one position, government agencies share similar concerns regarding the importance of addressing stress in the workplace. Domestically, the NIH, part of the

U.S. Department of Health and Human Services, and the National Institute of Occupational Safety and Health, part of the Centers for Disease Control and Prevention, stated that stress in the workplace and employee stress are occupational hazards as well as a global epidemic. These organizations conduct research studies and award research grants to researchers who work to understand stress as well as to develop better ways of managing stress.

However, even with these government agencies advocating the dangers of stress as an occupational hazard, no formal legal framework exists to address, control, monitor, or prevent occupational stress and protect employees from its consequences.

Global agency response. Internationally, agencies around the globe demonstrate their commitment to a less stressful world by conducting research and creating programs and assistance addressing stress across industries. Agencies such as the World Health Organization, the United Nations' International Labor Organization, the Canadian Institute of Stress, and the International Stress Management Association (ISMA) publish articles discussing new research geared toward practical and theoretical application of stress management programs. In addition, the ISMA has chapter branches in 11 countries including Australia, France, Georgia, Germany, China, Japan, the Netherlands, Russia, Spain, the United Kingdom, and the United States. Furthermore, the Canadian Institute of Stress, founded by Hans Selye, provides educational programs to researchers and practitioners for certification in stress and wellness.

These combined organizational efforts confirm the awareness of stress as a global problem and the fact that no individual or organization is immune from the effects of

stress. To respond to this problem, government agencies and organizational leaders need to proactively address stress in the workplace.

Stress Management Interventions

As previously mentioned, organizations typically respond to workplace stress by implementing a variety of SMI programs. However, these differences pose several challenges. First, the programs differ from organization to organization, by program intervention, as well as by occupation within an organization, thus lacking in practice standards.

Gaps and challenges. For example, some organizations may offer stress management programs only to senior executives or provide office space for SMIs but do not subsidize such services to employees (Azzone et al., 2009; Bellarosa & Chen, 1997; Kohler & Munz, 2006; Lamontagne et al., 2007; Randall et al., 2009; Schmidt-Wilk et al., 1996; Schure et al., 2008). Secondly, most research is conducted outside of the business setting and there is not enough documented research evaluating stress interventions within a non-clinical environment. Also, research indicates an inconsistency among practitioners' design of SMI programs, as well as discrepancies regarding which type of stress-reduction intervention is best. Some researchers argue that meditation or specific forms of meditation are the most effective types of intervention, while other researchers propose that one should simply make several intervention options available. Other researchers claim that it does not matter which technique is used, but rather that one should simply choose one and put it into action (Azzone et al., 2009; Bellarosa & Chen, 1997; Lamontagne et al., 2007). Still other researchers focus on the effectiveness of practiced interventions, arguing that some interventions are less effective than others.

To complicate matters, researchers are further divided in terms of recommending certain interventions based on their cost of implementation.

Types of stress interventions. The most commonly known and used and most effective SMIs found in the literature review include: meditation, guided breathing exercises, mindfulness training, visualization, music therapy, and physical exercise such as yoga (Bellarosa & Chen, 1997; Kabat-Zinn, 2002; Lamontagne et al., 2007). For the purpose of this research, the researcher chose to review two types of interventions: breathing techniques and Kabat-Zinn's (1994) MBSR. The justification for the choice of these two interventions is based on the case, as discovered in the literature review, that business leaders prefer interventions that are low cost, based on theory, and proven to be effective.

Breathing. Breathing techniques are typically used to reduce pain, tension, and anxiety. Evidence supporting this technique is documented as early as the 1940s when French obstetrician Dr. Fernand Lamaze observed former Soviet childbirth practices that used breathing as a means to help the mother cope with pain during labor. Dr. Lamaze brought these techniques to the United States where hospitals around the country began to use his method for labor and pain management (Janke, 1992). Since the 1970s, stress reduction techniques such as breathing have developed increasing interest in the area of workplace stress management, resulting in many changes to the modern workplace related to employee satisfaction, retention, reduction of healthcare costs, absenteeism, and increased productivity (Murphy & Sauter, 2003; Nigam, Murphy, & Swanson, 2003; Richardson & Rothstein, 2008). Dr. Jordan Baechler (as cited in "How to survive," 2012) asserted that using breathing techniques to reduce stress is a "tactic that anyone can do

anywhere, anyplace, anytime" (p. 6). A common goal of breathing techniques for stress reduction is to counteract the rapid, deep, and irregular breathing typically associated with stress or anxiety. Breathing is a natural, low cost intervention that immediately reduces the stress response in the body (Conrad et al., 2007; Feldman et al., 2010).

Mindfulness Based Stress Reduction (MBSR). MBSR is an intervention in which mindfulness practices are used as a tool to alleviate a variety of symptoms. Developed in the late 1970s by Jon Kabat-Zinn (1990), MBSR is typically used in clinical settings. Based on several Buddhist principles, MBSR is practiced without spiritual or religious motivations. MBSR is a practice that uses breathing to build awareness and acceptance by paying attention to the present moment non-judgmentally and with purpose (Kabat-Zinn, 1990; Yeganeh & Kolb, 2009). MBSR is typically taught as an 8-week course that includes instruction in meditation, guided awareness, guided breathing, and Hatha yoga (Kabat-Zinn, 1990). Currently, MBSR is one of the most well-researched and documented stress interventions, with over 30 years of research demonstrating its positive effects. During that time, over 18,000 people have completed an MBSR program. The MBSR program at the Stress Reduction Clinic and Center for Mindfulness in Medicine, Health Care, and Society at the University of Massachusetts Medical School is the oldest and largest academic medical center-based stress reduction program in the world (Center for Mindfulness in Medicine, Health Care, and Society, n.d.). Other university-based, medical-based, and private instruction MBSR programs exist around the globe. MBSR audio trainings are available on compact disc and range from 10-45 minute guided breathing meditations. Research has shown that even 5 minutes of mindfulness breathing practice can reduce stress and be restorative and healing (Kabat-Zinn, 1990).

Traditional Measurements

Measurable solutions with a theoretical foundation will be of great value to organizations. Thus, a recent trend exists of looking at clinical protocols for use in the workplace. However, Baechler (as cited in "How to survive", 2012) asserted, "even with all of the advancements in medicine, as clinicians, we don't have a good tool to measure and compare people's stress" (p. 1). Furthermore, while numerous stress studies have shown the detrimental health impacts of stress on the working population, a vast majority of studies are focused on clinical, academic, and medical settings (Feldman et al., 2010; Schure et al., 2008). A majority of clinical research studies are conducted with a non-workforce population such as patients and students; many of these studies involve synthetic stress situations (Feldman et al., 2010; LeFevre et al., 2006; Newman & Beehr, 1979; Schure et al., 2008; Stein, 2001). However, very little literature exists measuring stress interventions in business settings and with employees. Of the measurements used within the workplace, survey questionnaires are the most traditionally used measurement tools.

Survey questionnaires. The literature review indicates that the historically preferred method to measure effectiveness of stress interventions is the self-report survey (Bellarosa & Chen, 1997; Frew, 1974; Kohler & Munz, 2006; Lamontagne et al., 2007; Schmidt-Wilk et al., 1996). Typically, surveys consist of a series of quantitative questions linked to particular measurement variables such as emotional and physical effects. However, survey questionnaires present several challenges. First, researchers disagree regarding a preference for empirically quantitative surveys or interpretive qualitative surveys. Some researchers argue that empirical survey measurements are the most valid

method of assessment and prefer them to interpretive surveys (Frew, 1974; Kohler & Munz, 2006). However, other researches claim just the opposite and prefer qualitative measurements, arguing that these questions provide a deeper insight into personal stress experiences (Bellarosa & Chen, 1997; Frew, 1974; Lamontagne et al., 2007; Schmidt-Wilk et al., 1996). Another challenge is that some researchers claim that surveys, regardless of whether they are quantitative or qualitative, are ineffective measurements (Raitano & Kleiner, 2004); however, these researchers do not offer an alternative measurement method. Moreover, Lazarus (1990) argued that the best method to measure effectiveness is by using a mixed method of both empirical and interpretive surveys, thus giving researcher practitioners a well-rounded picture of participants' experiences and state.

The consensus among researchers is that survey questionnaires are practical to use, especially in the workplace setting. However, in reviewing stress questionnaires, the researcher found that standard survey questions were essentially unchanged from their original form since conception, outdated, and unrepresentative of present day business, global, and employee challenges. Thus, the survey benchmarking data and survey questions are representative of a population and global business lens from decades past. Thus, it is important to question the validity of the data gathered from such measures.

Clinical measurements. In addition to survey questionnaires, clinical researchers and medical practitioners such as neuroscientists used biofeedback modalities, lab tests, and clinical observations to measure the effectiveness of stress management programs and interventions. Lab tests such as saliva collection evaluate cortisol levels, which fluctuate under stress. Biofeedback measurements consist of a variety of clinical

instruments. For example, researchers and practitioners use electromyographic (EMG) technology for relaxation exercises, which is associated with muscle tension, insomnia, and temporomandibular joint (TMJ) disorders. Invented in 1924 by psychiatrist Hans Berger, another biofeedback instrument, the electroencephalogram (EEG), is used to record the electrical activity of the cerebral cortex, which is associated with the treatment of anxiety and migraine headaches. In 1903, physiologist Willem Einthoven invented the electrocardiogram (EKG), a tool that is still used today to record the electrical activity of the heart, which is associated with measurements for heart arrhythmias (Andreychuk & Skriver, 1975; Bellarosa & Chen, 1997; Braud, 1978; Lamontagne et al., 2007; McGrady, 1994; Peper & Tibbitts, 1992; Schmidt-Wilk et al., 1996; Stein, 2001; Telles, Nagarathna, & Nagendra, 1995; Trudeau, 2000).

All of these clinical measurements are considered reliable and valid instruments and are used today in clinical stress research; however, two of these mainstream measurements were invented more than 83 years ago. Using a biofeedback modality requires attached self-adhesive sensors or electrodes on the person's body that connect to a biofeedback monitor, which limits its practicality in a non-clinical setting. Furthermore, biofeedback measures the physiological changes in response to varying stimuli, thereby omitting emotional and human biofield measurements.

New Measurements

In recent years, an emergence of consciousness and brain-based discussions has increased research and mainstream interest in these subjects. Practitioners such as Deepak Chopra have introduced numerous books, services, and practices regarding consciousness, meditation, and stress reduction breathing into mainstream society.

Bridging eastern and western practices, Chopra and others integrate alternative, non-allopathic information to raise awareness of various practices to reduce stress (Chopra, 2009). However, western-based cultures tend to cling to scientific evidence and prefer to embrace findings from scientific fields such as neuroscience.

Neuroscience and brain-based measurements. Emerging awareness from brain-based research and neuroscience are revealed using the latest imaging technology. Neurological imaging techniques such as functional magnetic resonance imaging (fMRI) have illustrated that meditation does affect a person's brain functioning (Davidson et al., 2003). The current widespread and growing use of meditation and other stress techniques in hospital and clinical settings as well as academic research centers along with neurological imaging is providing additional information regarding stress and stress-reduction interventions.

From past stress research and neuroscience surfaced modern practitioners such as David Rock and Jeffrey Schwartz. Rock and Schwartz (2006a) integrated neuroscience, the study of the anatomy and physiology of the brain, with psychology, the study of human mind and human behavior, and applied research for individual and organizational effectiveness such as addressing stress as well as OD change interventions. During the 2008 and 2010 National Organization Development Network annual conferences, Rock presented his findings and application as the keynote speaker. Rock supported the finding that stress in the workplace and employee stress affect the human brain and energy. He stated that if an employee experiences stress, the brain responds by producing signals that something is not right; the perceived event can overpower a person's rational thought as well, as causing more stress and making the situation worse (Rock & Schwartz, 2006a).

Methods used to assess brain activity typically involve imaging technologies such as the previously mentioned fMRI or positron emission tomography (PET) along with brain wave analysis technologies of quantitative electroencephalography (QEEG). These technologies "have revealed hitherto unseen neural connections in the living human brain" (Rock & Schwartz, 2006a, p. 2). Rock and Schwartz (2006b) note that "we live in a materialistic world where organizations respect things that can be measured" (p. 1) and that "senior executives, being academically trained and analytical, will want a theory base, evidence and research to support the introduction of any new way of thinking into their organization" (Rock & Schwartz, 2006b, p. 1). The measurements to which they are referring are brain-based measurements such as the previously mentioned fMRI.

Rock and Schwartz term their exploration of neuroscience in the workplace *social neuroscience*. A review of their research describes a hypothetical view of brain activity if one were to take an fMRI scan of an employee at an organization. In other words, their research does not include actual imaging of employees' brain responses along with an interpretation of the images taken within an actual work environment, but rather links clinical neurological studies in a controlled environment to real world situations in the workplace (Rock, 2008; Rock & Schwartz, 2006a, 2006b).

Given the known position that OD is about theory, research, and application, the researcher recognized the need to explore and identify a practical, reliable, and non-invasive means by which to evaluate and assess stress in the workplace and employee stress outside of an fMRI or outdated survey questionnaire instruments: a modern instrument that could practically be used within the workplace. Clearly the need for a new approach exists.

Computerized Gas Discharge Visualization (GDV). Another emerging concept has emerged from brain-based research and neuroscience integrated with physics and biofields. While western science is rooted in empirical theory and discovery, the east is rooted in biofields, measurable by meridians within practices such as acupuncture. The advancement of physics, sciences, and technology has allowed researchers to explore previous unknowns and provide new discoveries and insights: for example, the invention of the computerized GDV camera, which provides visual feedback of a person's biofield and physical and emotional responses to symptoms related to stress (Korotkov, 2000).

History. The GDV camera is based on the Kirlian Effect and the electrophotonic (EPC) method. Pioneered by inventors Semyon and Valentin Kirlian in 1939, the Kirlian Effect and EPC method refer to the illumination of a weak photon emission that amplifies a gas discharge from an object when placed within an electromagnetic field and the capture of that illumination on photographic material (Korotkov, 2000). Kirlian continued to conduct research and investigated electrophotonic imaging until his death in 1978 (Korotkov, 2000).

The Kirlian method influenced a variety of practical applications on biological subjects from people to plants to water. More than 1,000 publications exist regarding the Kirlian Effect involving human subjects in scientific experiments (Korotkov, 2002). Many researchers have struggled to reproduce Kirlian method images, as the method required using a darkroom to process the photographic paper. In 1978, the growth of this method's application led to the formation of the International Union of Medial and Applied Bioelectrography (IUMAB). The IUMAB has many purposes, including consolidating research methods, supporting scientists around the globe, and identifying as

well as solving application challenges. Difficulties included reproducing data to meet methodological standards, modeling technical means, absence of statistical comparison of data, quantitative processing of images, standards of research methods, and inconvenience of processing equipment requiring the photographic process and darkrooms (Korotkov, 2002).

Then in 1995, Russian biophysicist Dr. Konstantin Korotkov invented the GDV camera, which digitized the Kirlian effect and EPC method through the use of modern computer technology, software data processing, and digital optical video imaging. Later in 2000, the IUMAB elected Dr. Korotkov to be their President.

Technique. The principle of GDV is described as follows; a participant's finger is positioned on the optical glass. On the backside of the glass, an electromagnetic field generates pulses at 10 microseconds for 0.5 seconds in duration, which stimulates the excitement of gases around the object (GDV grams) and generates a glow around the finger. The term *gram* is used to denote an image as is commonly used in other applications such as an electrocardiogram. This glow is captured with an optical system and camera as a GDV image, which is then transformed into video signals and is recorded as a computer file (see Figure 1).

Each finger image is captured both with and without a polymer filter, accounting for moisture on the skin surface, which changes gas emissions and influences the parameters of GDV gram generation (see Figure 2). The GDV software processes these raw data images using basic parametric mathematical calculations. Each finger emission image is analyzed with more than 30 parameters for the total and normalized area such as

brightness, symmetry and entropy, density, area, sector, age, probability, and traditional Chinese and Korean acupuncture points (Korotkov, 2000, 2002).

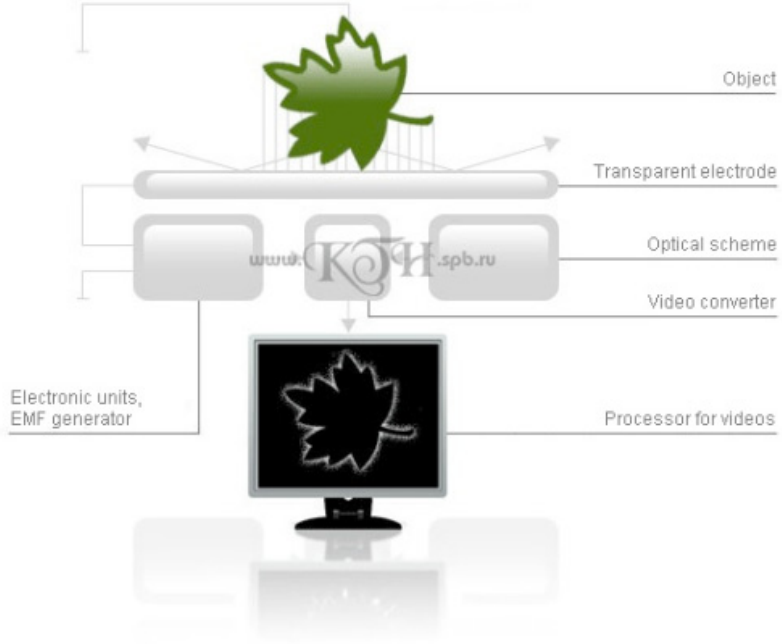

Figure 1. GDV technical process. Copyright 2011 by Kirlionics Technologies International. Reprinted with permission.

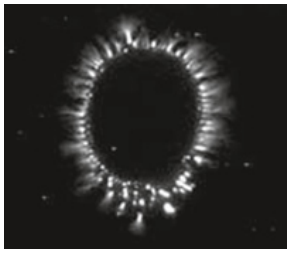

Figure 2. GDV gram image of a single finger.

GDV gram calculation uses a variety of GDV software module applications such as GDV Diagram, which measures stress and anxiety. GDV Diagram calculates the 10 fingertip images with and without a filter, resulting in two corresponding graphs that depict the biofield, physical and emotional responses, and level of stress indices showing the ratio of physical and emotional fields. The quantitative parameters of each finger's luminosity image are presented in the form of a point situated in a multidimensional

parameter space. The person's level of anxiety is determined by the distance between the points produced through the film, both with and without the filter. A smaller distance between points equates to a lower anxiety level and a larger distance between points indicates a higher anxiety level. The stress scale ranges from 0-2 (low stress level), to 2-4 (normal stress level), to 4-6 (heightened stress level), to 6-8 (high stress level), to 8-10 (distress; see Figure 3).

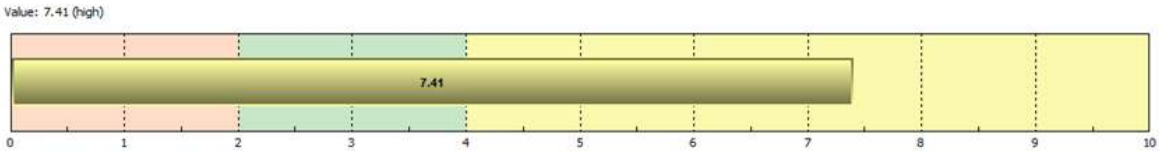

Figure 3. GDV Diagram Stress Index with scales ranging from 0 to 10 denoted in pink, green, and yellow zones.

The GDV camera is recognized around the globe as a valid, reliable, and scientific camera to capture the human biofield as well as individuals' stress and anxiety levels (Korotkov, 2002; Korotkov et al., 2010). Also, the GDV camera and supporting software is the first computerized device in the world that measures the distribution of human biofield and emotional and physical states in a manner that is non-invasive, supported by scientific research, inexpensive, valid, and reproducible.

GDV has been used in clinical studies in Russia, England, Germany, Slovenia, the United States, and is used in 63 countries around the world (Korotkov et al., 2010). Furthermore, GDV cameras have been used in research published in over 160 peer-reviewed journal articles and clinical studies addressing subjects such as complementary and alternative medicine, stress, and consciousness (Korotkov, 2011). Research involving GDV cameras has been conducted at academic institutions such as John Hopkins University, University of Arizona, University of California Berkeley, George Washington

University, and Penn State (Korotkov, 2011; Korotkov et al., 2004; Rubik, 1994), as well as at U.S. government agencies such as the NIH (Wisneski & Anderson, 2009), and in corporate research and development at companies such as Aveda (Korotkov, 2011; Korotkov et al., 2010). However, all of these applications of GDV, including measuring stress, have been performed in a clinical setting. GDV is yet to be used to measure stress in a non-clinical setting and in an actual business environment.

Synthesis of Literature

Based on an extensive review of literature on stress, workplace stress, and employee stress, Figure 4 illustrates common themes and the key points related to this research study, including organization environmental stressors, personal stressors, employee stress indicators, status quo, stress management technique intervention, desirable and undesirable aftereffects, and employee and work group states and performance. Each key point section includes details that illustrate the specific meaning of the key point.

The overview figure provides a comprehensive overview of key themes related to the literature review, which was then used to design the research study. The proposed study integrates the topic of stress, prior clinical and workplace stress research, SMIs, and traditional measurement methods, and adds value by introducing a new measurement method.

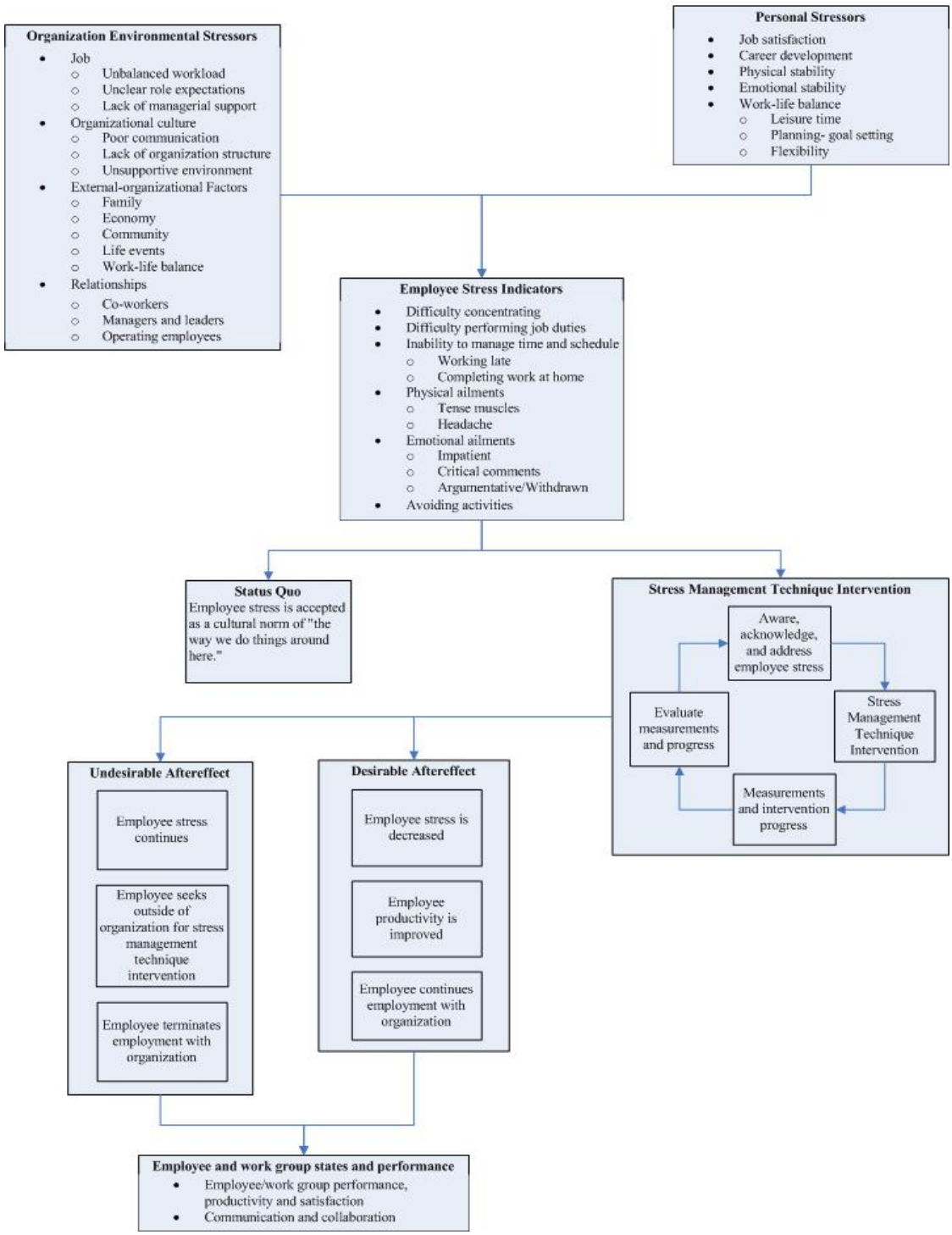

Figure 4. A synthesis of the reviewed literature identifies the common themes, actions, and effects of stress, stress interventions, and outcomes not using an intervention.

Summary

As noted throughout this chapter, various approaches to address and measure stress have been used in a great number of clinical, academic, and medical settings. However, very little literature exists examining the effects of interventions on stress in a workplace setting, especially when using a new and valid measurement tool. Given the lack of exploration of stress interventions for a specific workplace population as well as a modern measurement tool, an innovative and whole systems examination is needed to fully understand the impact of stress faced by employees and the best ways to intervene to mitigate that stress and evaluate the effectiveness of such interventions.

The following chapter outlines the proposed research study, which aims to explore the effectiveness of an SMI and compare traditional survey measurements with GDV measurements. Specifically, the study will examine the effects of an intervention within the workplace while comparing a traditional stress assessment survey to a GDV, newly used in workplace stress measurement.

Chapter 3: Research Methodology

This chapter describes the methods and procedures and is divided into the following sections: research design, sample, procedures, data collection methods, and data analysis methods.

Research Design

The present investigation was a mixed methods research study using a convergent design. The purpose of a convergent design is to collect different but complementary data on the same topic using both quantitative and qualitative methods (Creswell & Plano Clark, 2011). In this design, the researcher collected both quantitative (QUAN) and qualitative (QUAL) data at the same time; first in one complete phase and then in two subsequent complete phases. The data for each phase were then compared to determine the presence of a convergence, differences, or some combination of the two.

The convergent design was previously known as a concurrent triangulation (CTA) design with a CTA convergence model where two different methods, quantitative and qualitative, are triangulated about a single topic (Creswell & Plano Clark, 2007; Creswell & Plano Clark, 2011). Creswell and Plano Clark (2011) changed the term to *convergent design* as the previous term was often confused with triangulation, which is typically associated with qualitative research.

According to Creswell and Plano Clark (2011), convergent design occurs when the researcher collects both quantitative and qualitative data during the same phase of the research process, separately analyzes the data, and then merges the two sets of results into an overall interpretation to compare, validate, confirm, relate, or produce a more complete understanding of the merged results.

Other purposes for using this design include bringing together the strengths of one method to offset potential weaknesses of the other method. Plano Clark and Creswell (2008) claim that convergent design's effectiveness "rests on the premise that the weaknesses in each single method will be compensated by the counter-balancing strengths of another" (p. 110). In essence, either method could be considered be weak if used as a standalone. For example, a quasi-experimental methodology is generally considered weak as a standalone due to a small sample size (Creswell & Plano Clark, 2007). The convergent design is typically used in a shorter data collection time period. To strengthen the convergent design, the researcher can conduct the research in complete multiple phases (Creswell & Plano Clark, 2007).

The convergent design consists of a four-step process (see Figure 5). First, the researcher collects both the quantitative and qualitative data regarding the research topic. Both the data sets are concurrent but independent of one another and are of equal importance in answering the research questions. Second, the two sets of data are separately analyzed using the appropriate quantitative and qualitative procedures. Third, once the two sets are analyzed, the results are merged for comparison. Fourth, in the final step, the data are interpreted to "what extent and in what ways the two sets of results converge diverge from each other, relate to each other, and/or combine to create a better understanding in response to the study's overall purpose" (Creswell & Plano Clark, 2011, p. 78).

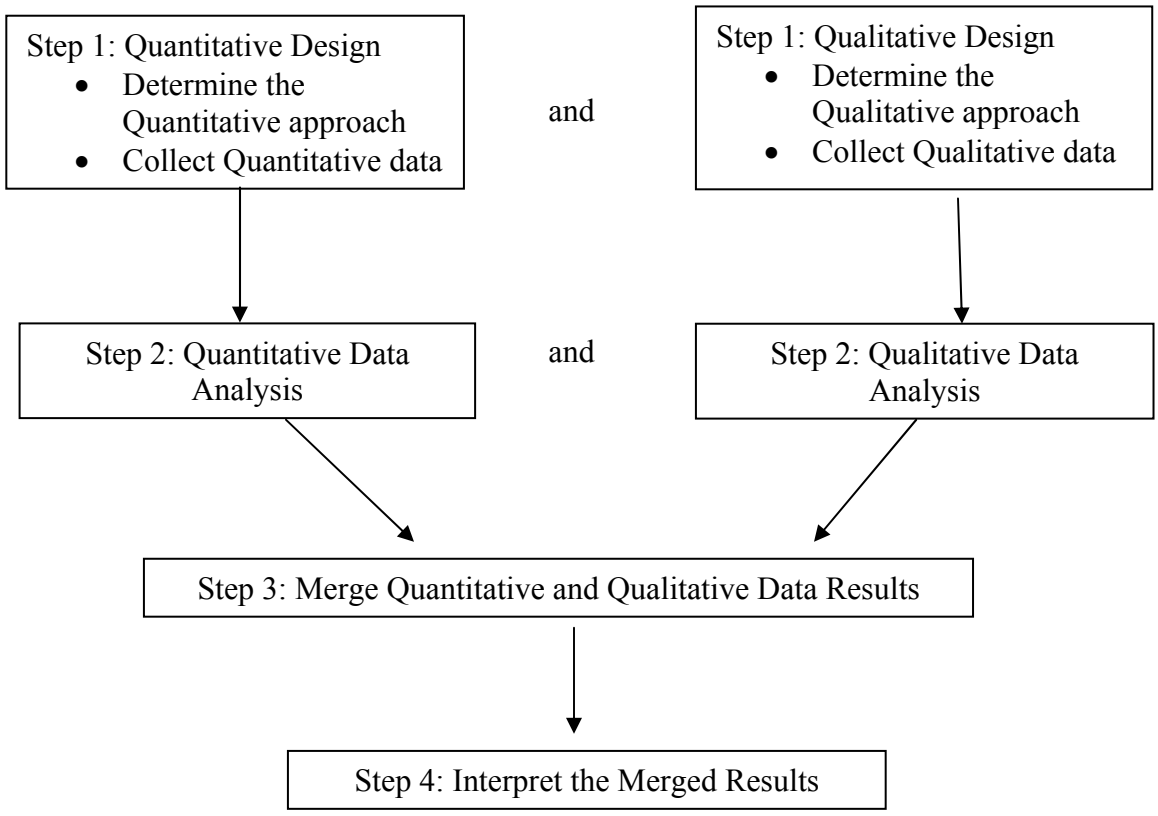

Figure 5. Mixed methods convergent design: Four-step process.

This study used a mixed-methodology design of quantitative and qualitative approaches (Figure 6) to examine the effects of a stress intervention within a business environment as well as introduce a new measurement assessment. A non-randomized quasi-experimental, pre-test and post-test, two group, short time series design was used to collect quantitative data, from the GDV captures (Table 1). These variables were measured before and after the intervention for 3 consecutive months at 4-week intervals. Both groups participated in the 10-minute "Sitting Meditation" MBSR guided breathing intervention (Kabat-Zinn, 1994, tr. 1) after all participants' pre-intervention GDV images were captured.

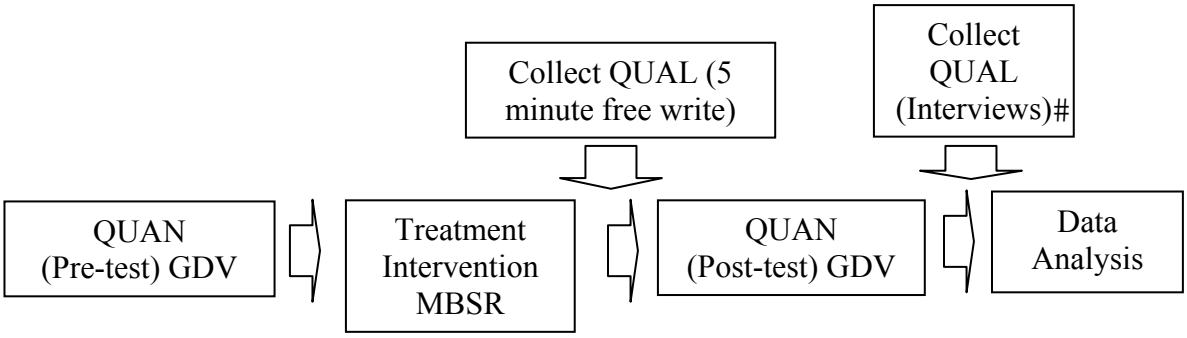

Figure 6. Quantitative and qualitative approaches with employee participants.

Table 1

Schematic of Quantitative Time Series Study Design

Assignment	T_1	T_2	T_3
Work Group A: NR	$O_1X_1O_2$	$O_3X_2O_4$	$O_5X_3O_6$
Work Group B: NR	$O_1X_1O_2$	$O_3X_2O_4$	$O_5X_3O_6$

Note. NR = non-random; O = measurement; X = treatment

A quasi-experimental methodology was chosen as it accommodates conducting a quantitative research study within a real world context, allowing the researcher to study a natural phenomenon (Campbell & Stanley, 1963; Ross & Morrison, 2004; Shadish, 2002; Shadish et al., 2002). Also, the pretest-posttest design supports a research structure without a control group while allowing for observation of participants' experience with a treatment (Shadish et al., 2002). Along with a pretest-posttest design, an interrupted time series design plus two comparison groups strengthened the validity of this research study. The multiple data collection points lessens threats to internal and external validity, allowing the researcher to report if a change has occurred, the timing of changes, and comparison between treatment groups.

The qualitative methods used were a semistructured post intervention 5-minute free writes and follow-up interviews. One week prior to the quantitative data collection

and 1 week after the program completion, the researcher met with each company team manager and asked a series of qualitative interview questions related to employee stress and productivity (see Appendix A). In addition, participant follow-up interviews occurred over the telephone 1 week after the program completion. These interviews took were conducted over the telephone. The researcher transcribed the responses using her laptop computer. All noted responses remained on the researcher's computer, which is password protected and stored in a locked home office.

Data collection at T_1, T_2, and T_3 included stress levels as measured by GDV image captures. The data collection at each measurement time point (T_1, T_2, and T_3) was completed in 1 hour for each group. After the pre-intervention GDV images were captured, the participants completed a 5-minute free write questionnaire. Following the free write, the post-intervention GDV images were captured. This process was repeated at T_2 and T_3 with the same groups of participants. Following the third intervention, each participant was scheduled for an individual in-depth telephone interview, which took 30 minutes. All the interviews and transcriptions were completed by the researcher.

The framework for creating the research design "needs to state the conditions under which a particular phenomenon is likely to be found as well as the conditions when it is not likely to be found" (Yin, 2009, p. 54). As mentioned earlier, both organizations were experiencing a naturally occurring stressful time period within their organization. Given that this research was a non-clinical study and was conducted in an actual business environment, the quasi-experimental methodology was deemed suitable for this research (Shadish et al., 2002) and presented dual advantages of convenience and practicality. In addition, this supports Yin's (2009) condition component.

The work groups agreed to participate in this research over a period of 3 consecutive months, a time frame that was chosen for many reasons. First, since organizations are concerned about the usage of time, money, and other resources, a brief yet effective intervention could be more desirable than one that takes a longer time period to implement. Also, a 3-month timeline is a common time period for change or decision-making within organizations (Kotter, 1996). Secondly, short-term goals are becoming shorter, as are long-range plans, in the modern world of technology and globalization where business management expects to see some short-term progress with change initiatives (Schermerhorn, 2011). Most people work more comfortably in 3-month time spans rather than in longer time spans (Jaques, 1982). Furthermore, a time series design with a pre-test and post-test can provide a higher internal validity, thus accounting for the absence of randomization (Ross & Morrison, 2004).

The mixed methods design was used for the purpose of collecting rich data. Ross and Morrison (2001) stated that quantitative and qualitative data are more valuable combined than when used separately; "both provide unique perspectives that when combined are likely to yield richer and more valid understanding" (Ross & Morrison, 2001, p. 1,039), as well as broader and more complementary perspectives on research outcomes.

Sample

Human subjects protection. The researcher received approval for conducting research with human subjects through the Institutional Review Board (IRB) at the University of St. Thomas prior to the initiation of this research study. The IRB process

ensures the welfare and rights of human research participants are protected under the Belmont Report and Common Rule Title 45 CFR 46.

Inclusion criteria. This study involved a total 18 participants; 8 from one company (Company A) and 10 from a second company (Company B). All participants from each company are part of the same work team. Since this study is a two-group comparison, participants needed to be part of a workgroup and meet the following criteria:

1. Fulltime employees in a work group
2. Experiencing naturally occurring stress
3. Speak and understand English
4. No implantable heart devices

Procedures

Recruitment. The participating organizational work groups were identified through personal and professional networking resources. The researcher has been in the business industry for over 15 years and practicing energy interventions for over 3 years, and has developed an extensive international network. The recruitment email is attached in Appendix B.

Screening and informed consent. Potential participating organizations were screened to see if they met the inclusion criteria. For organizations meeting the criteria, the researcher scheduled a time to meet with the potential participants. During this meeting, the potential participants were informed about the purposes of this study, what it involved, and how the data would be collected. Potential participants were also informed about the standard principles for protecting human subjects as well as the right to refuse,

withdraw from, or stop participating in the study at any time. Additionally, at this meeting the researcher answered all of the potential participants' questions. Individuals agreeing to participate in the study were given a Letter of Consent and Confidentiality Agreement (Appendix C) to sign and were given a copy to keep for their records.

Once the participants were identified, the researcher collected the signed consent forms, assigned each participant a random numerical identification number, and entered the data into an excel file sheet marked Dissertation Data Intervention Company A Work Group and Company B Work Group. The numerical ID designated the participant for each data capture so that he/she would not be identified by individual name, thus ensuring anonymity and confidentiality of each participant.

Site. The research study took place on-site at the organization in a room that could accommodate the size of the work group and allowed the groups to be undisturbed during the breathing intervention and data collection process. T_2 and T_3 occurred on the same day of the week at the same time in 4-week intervals for 3 consecutive months.

Data Collection Methods

The researcher used multiple sources to collect the data. Triangulating the data sources strengthens the validity of the study and determines whether or not the hypotheses will be proven true (Yin, 2009). The data collection methods are divided into two groups: quantitative and qualitative sources.

Quantitative instruments and techniques. The quantitative data collection method used the GDV Compact camera to capture pre-intervention and post-intervention photographs. The researcher is trained in GDV technology, has received advanced certifications in GDV imaging and the operation of the GDV Compact camera (GDV

Korotkov Technique Level 1, GDV Korotkov Technique Level 2, and GDV Korotkov Technique Advanced GDV), and owns a GDV Compact camera and all GDV software modules. The following protocol was followed to capture participants' GDV images:

1. The researcher turned on the camera and connected the camera to the laptop computer using the GDV camera cable, which allows the digital images to be instantly seen on the computer as well as to be stored using the GDV Diagram software.
2. The researcher calibrated the camera by capturing a series of 10 photographs using the calibration object, which allowed the researcher to capture test images to ensure that the participants' images would be clear and undistorted.
3. Once the camera was calibrated, the researcher verbally communicated the capture procedures and demonstrated the finger placements to the participant. Finger placement began with the left hand thumb, placing the thumb pad with light pressure and holding it still on the camera lens. The researcher identified individual images by the participant's user identification number. The researcher first captured images with the filter and then without the filter, moving from the left hand thumb, index finger, middle finger, ring finger, and pinky finger to the right hand thumb, index, middle finger, ring finger, and pinky finger. This process continued for each participant with both pre-intervention and post-intervention GDV camera images.
4. After all images were captured, the researcher turned off the camera and disconnected the camera cable from the computer.

5. These steps were repeated for each data collection session during the 3 consecutive months.

Qualitative data. Qualitative data were collected at three intervals during the study. One interval occurred prior to the group intervention and involved interviewing the managers. For the managers, their pre-and follow-up interviews used the same questionnaire, with the post interview adding one question. The manager interviews were each scheduled for 30 minutes.

Participant qualitative data was collected after each MBSR breathing intervention with a 5 minute free write. The question from the 5 minute free write remained the same or all 3 months. After the third intervention, the participants were scheduled for follow-up interviews. These interviews took place 1 week following the third intervention. The researcher interviewed the participants via telephone at a time that was convenient for them about their experiences in participating in the program and practicing the MBSR breathing technique. The changes in their thoughts, feelings, and perceptions were also explored. The interviews were scheduled for 30 minutes each. For the interviews, the researcher used a semistructured interview guide (Appendix D), which "involves asking a series of structured questions and then probing more deeply with open-form questions to obtain additional information" (Gall, Gall & Borg, 2007, p. 246). All interviews were transcribed by the researcher and saved on her personal computer using password protection.

Intervention. The MBSR breathing intervention lasted 10 minutes during each interval. Participants were led through an audio-guided exercise focusing on full and

relaxed breathing and guided awareness of bodily sensation. This process repeated for each data collection event.

Limitations

Limitations of the study included various elements of the research design. The optimal study design for this research was quasi-experimental due to the non-randomized population sample as well as having no control group. Several variables were not controlled and need to be considered as potentially confounding given the quasi-experimental time series measure design.

The threats to the validity of this research study involve additional root causes to stress experienced by employees such as personal economic crises, medical and mental chronic illness, recreational drug and alcohol usage and/or dependency, mourning, and/or family crisis. This study did not investigate those root causes.

Another limitation is that this research involved two work groups each from different organizations, therefore eliminating other work groups from each company. This was a limiting factor given that the employee work groups interact with other full-time, part-time, and contractual colleagues across the organization. While employee stress may occur in other areas of the organizations, this research focused on the two work groups. A limitation exists that if additional work works participated in the study and increased the overall sample size, this could potentially result in more robust results. In contrast, field research of two work groups as opposed to more than two work groups has the potential to result in valuable collected data that would otherwise be missed within the bounds of this time sensitive study.

The study's sample of participants was comprised of working adults. The participants completed the same 5-minute free write questionnaire at three points in time over 3 months and were likely to be affected by the historical effect (e.g., a participant's attempt to recall previous answers and note any perceived changes since the last response time).

Also, participants were not randomly selected for participation in this research study; thus, this design did not control for volunteer bias. Stone-Romero (2009) termed nonrandom sampling *convenience sampling*, which is based on one's availability to participate in a study. An example of a convenience sampling strategy is used when selecting participants in a workplace.

Lastly, no control group was used. As a result, unseen variables or other factors not controlled by the researcher were difficult to predict and counteract.

Delimitations

Delimitations of a research study define the limits to a particular population. For purposes of this proposed study, the researcher purposely did not select individuals with an implantable heart device (IHD) as the camera battery placement is directly under the camera lens, on top of which participants must place their fingers in order for the researcher to capture a camera image. Although the GDV camera uses a standard AC power and there have been no clinical or reported problems capturing camera images of individuals with IHDs nor requests by the manufacturer to limit GDV photographs of people with IHDs, the researcher preferred to err on the side of caution by not including this group of people within the study.

The proposed research focused on for-profit businesses. All participants were full-time employees of the organization. Some participants may have owned company stock in the business. This delimitation identifies the intentional exclusion of other types of businesses such as non-profit or government. This study also was bound by the constraints of employees within a work group, the work group managers, all of whom were operating within a naturally occurring stress period in their business cycle. Both participating companies were within this boundary as each company was at the completion phase of a project.

Data Analysis Methods

The researcher used several data analysis methods involving both quantitative, qualitative, and mixed methods convergent data.

Quantitative data. Quantitative data analysis occurred first, using proprietary GDV Diagram software module to scientifically calculate a stress index for each individual. After the calculations, the data were entered into an Excel file on a personal password-protected computer accessible only by the researcher.

Secondly, quantitative analysis included conducting a descriptive statistical analysis using IBM SPSS Statistics Software GradPack 18 and Excel for mathematical calculations. The descriptive analysis occurred following an additional method of data analysis, which included conducting a *t* test analysis to assess the effectiveness of the intervention for each month and across the time series for the whole group.

Qualitative data. Qualitative data analysis occurred first with data from each group, and secondly with a cross group analysis.

Interviews. The researcher followed qualitative analysis methods from Creswell (2009) and Yin (2009). The following protocol was utilized to analyze qualitative data from interviews:

Creswell's six stage process. Qualitative data analysis begins with organizing and reading every interview transcript before moving on to the next transcript. Creswell (2009) identifies a six-stage process to qualitative data analysis:

1. First Stage: Organize. This stage involves transcribing interview data and field notes, and arranging data by the sources of information.
2. Second Stage: Read. This stage involves reading through the data to get a general sense of the information and its overall meaning.
3. Third Stage: Code. The coding stage involves organizing the data into segments or chunks of text and labeling each with a specific term.
4. Fourth Stage: Description of Themes: The fourth stage involves creating a description of the labeled text, and then generating themes or categories from the coding process.
5. Fifth Stage: Interconnected and Sub Themes: The fifth stage involves an advanced description of the primary themes or categories to identify subthemes or interconnected themes.
6. Interpretation and Meaning of Data: The final synthesis of the data involves combining the concepts and themes to identify what they collectively imply. At this stage, conclusion will be drawn about how the phenomenon under investigation operates.

Yin's techniques. In conjunction with Creswell, the researcher used Yin's techniques for analyzing qualitative data. According to Yin (2009), data collection should include an analytic strategy and techniques to analyze the collected data. The research followed Yin's strategy of examining the data outputs to determine "whether any meaningful patterns are emerging" (p. 128). The researcher identified patterns in the collected data from the manager pre- and follow-up interviews, free writes, as well as individual follow-up interviews. The pattern identification analysis occurred separately for Company A leader and Company B leader, as well as a cross comparison between Company A leader and Company B leader. The same pattern identification occurred for the work groups, with a separate analysis for Company A work group and Company B work group.

Mixed methods convergent data. Mixed methods convergent data analysis included conducting a standard Pearson's correlation using IBM SPSS Statistics Software GradPack 18. The quantitative data component used was the GDV stress data. The qualitative data component was quantified qualitative data. Both sets of data were used for conducting the correlational statistic to test the relationship between GDV stress scores and the self-reported stress free writes.

Researcher Bias

According to Yin (2009) a good researcher "must have a firm grasp of the issues being studied…as well as unbiased by preconceived notions" (p. 69). The researcher adopted several processes to remain neutral and aware of personal potential biases. First, using Yin's test of possible bias by self-reflection, the researcher maintained awareness to the "degree, in which the researcher is open to contrary findings and compelling

evidence" (p. 71). Secondly, the researcher maintained focus on answering the research questions by using a mixed method combination of traditional measurements as well as contemporary GDV measurements. Lastly, given the researcher's experience in GDV technology and passion for biofield research, the researcher remained committed to report any contradictory and unusual findings (Ivancevich & Matteson, 1980). In addition, triangulating the data through multiple data collection points reduces the likelihood of researcher bias. Furthermore, Stone-Romero (2009) stated, "it is generally wise to collect data from multiple sources" (p. 43). Collecting data from multiple sources can avert challenges such potential as researcher bias.

Summary

This investigation used a mixed methods research study employing a convergent design, non-randomized quasi-experimental, pre-test and post-test, two group, short time series design with qualitative approaches. The overall structure of collecting and analyzing the data supported the purpose of combining traditional qualitative measurements while introducing a new quantitative measurement. In addition, the research design and methods supported a field research study and analyses. Furthermore, the research design of multiple data collection sources supported an enriched research study (Yin, 2009), adding to the body of knowledge related to the topic of workplace stress and a new stress measurement tool.

Chapter 4: Results

This research explored employee stress as experienced by fulltime employees within a work team in an actual workplace environment. In addition, this research explored using a new quantitative measurement tool, GDV, in the workplace and comparing GDV stress results with two qualitative self-reported measurements of stress; a participant free write and follow-up interviews. The following two research questions were examined:

1. What effect does a 10-minute stress management intervention, used once per month for 3 consecutive months, have on employee stress among employees of a work team within a workplace?
2. How do the GDV camera stress measurements compare with qualitative self-reports of stress?

These questions were investigated with a convergent mixed methods methodology using a quasi-experimental design for the quantitative component and open-ended questions for the qualitative components to examine the relationships between a new quantitative stress measurement and qualitative self-reported perceived stress data.

A mixed methods methodology was chosen for two reasons. First, both the quantitative and qualitative components have positive qualities that the other does not. For example, the quantitative methodology allows for conducting statistical analyses and evaluation of the data. Alternatively, qualitative methodology allows for emergent themes and meanings. Secondly, a mixed methods design strengthens the rigor, depth and breadth of the research by examining emerging information from one method and reinforces this information through further examination by the other method.

Full-time employees within a work team from two different organizations were invited to participate in the research study. From Company A, a total of 15 people signed consent forms to participate with 8 people actually participating. From Company B, a total of 11 people signed consent forms to participate with 11 people participating. However, for both groups, not all people participated in the study for all 3 months. This was due to absentees from traveling and work schedules. Additionally, one person relocated out of state.

The following results are organized by sequence of data collection. The first section compiles the quantitative data analyzing GDV pre-post intervention stress measurements by participants, company, and whole group. The second section compiles the qualitative data by participant free writes, participant follow-up interviews, and manager pre-post interviews. In the final section, the quantitative and qualitative analyses are correlated and compared to identify where they agreed, differed, and complemented each other.

Quantitative Data Results

Quantitative data were analyzed to test the significance that there would be a positive impact on the stress levels of participants who received a MBSR breathing stress intervention, as measured by GDV camera stress pre-post measurements. The paired samples *t* test summaries (Table 1) indicated that when the mean whole group differences among participants experiencing a MBSR breathing stress intervention for 10 minutes used once per month for 3 consecutive months were converted into effect sizes, the Month 1 values were .732, Month 2 values were .328, Month 3 values were .034, and pair 4 testing Month 1 pre intervention to Month 3 post intervention values were .114

Therefore, using a generally statistically significant level of $p < .05$ (Gall et al., 2007), Months 1 and 2 were not statistically significant; however, Month 3 was statistically significant. Exploratory studies typically use a significance level of $p < .10$, therefore, pair 4 testing Month 1 pre intervention to Month 3 post intervention is borderline significant. Table 2 illustrates the mean for the whole group by month including Month 1 pre with Month 3 post comparison.

Table 1

Whole Group Paired Samples Test Pre-Post Intervention

		Paired Differences				
		95% Confidence Interval of the Difference				
		Lower	Upper	t	df	Sig. (2-tailed)
Pair 1	Month 1 Pre-Intervention GDV Stress Level - Month 1 Post-Intervention GDV Stress Level	-.71849	.51849	-.349	13	.732*
Pair 2	Month 2 Pre-Intervention GDV Stress Level - Month 2 Post-Intervention GDV Stress Level	-1.31972	.47543	-1.016	13	.328*
Pair 3	Month 3 Pre-Intervention GDV Stress Level - Month 3 Post-Intervention GDV Stress Level	.05432	1.19768	2.349	14	.034*
Pair 4	Month 1 Pre-Intervention GDV Stress Level - Month 3 Post-Intervention GDV Stress Level	-.13624	1.09260	1.734	10	.114**

Note. *$p < .05$, **$p < .10$

Table 2 presents the mean for the whole group by month including, Month 1 pre with Month 3 post comparison. Table 3 illustrates descriptive statistics and the paired differences of the means. Month 1 and Month 2 indicate an increase in stress whereas Month 3 and Month 1 pre with Month 3 post show a decrease in stress.

Table 2

Whole Group Paired Samples Statistics

		Mean	N	Std. Deviation	Std. Error Mean
Pair 1	Month 1 Pre-Intervention GDV Stress Level	3.6186	14	.76883	.20548
	Month 1 Post-Intervention GDV Stress Level	3.7186	14	1.17474	.31396
Pair 2	Month 2 Pre-Intervention GDV Stress Level	3.7229	14	1.70982	.45697
	Month 2 Post-Intervention GDV Stress Level	4.1450	14	2.20083	.58820
Pair 3	Month 3 Pre-Intervention GDV Stress Level	3.6533	15	1.26649	.32701
	Month 3 Post-Intervention GDV Stress Level	3.0273	15	.70369	.18169
Pair 4	Month 1 Pre-Intervention GDV Stress Level	3.4727	11	.79216	.23885
	Month 3 Post-Intervention GDV Stress Level	2.9945	11	.44019	.13272

Table 3

Whole Group Paired Samples Test

		Paired Differences		
		Mean	Std. Deviation	Std. Error Mean
Pair 1	Month 1 Pre-Intervention GDV Stress Level - Month 1 Post-Intervention GDV Stress Level	-.10000	1.07120	.28629
Pair 2	Month 2 Pre-Intervention GDV Stress Level - Month 2 Post-Intervention GDV Stress Level	-.42214	1.55456	.41547
Pair 3	Month 3 Pre-Intervention GDV Stress Level - Month 3 Post-Intervention GDV Stress Level	.62600	1.03232	.26654
Pair 4	Month 1 Pre-Intervention GDV Stress Level - Month 3 Post-Intervention GDV Stress Level	.47818	.91458	.27576

Table 4 illustrates the percentage change of mean GDV stress levels by group and whole group. In Month 1, Company A showed an increase in stress, Company B showed a decrease in stress, and Whole Group recorded an increase in stress. In Month 2, Company A showed an increase in stress, Company B showed a decrease in stress and Whole Group recorded an increase in stress. For Month 3, Company A, Company B, and Whole Group all showed a decrease in GDV stress levels. For Month 1 pre and Month 3

post scores, Company A, Company B, and Whole Group showed a decrease in GDV stress levels.

Table 4

Groups: GDV Pre-Post Percentage Increase/Decrease of Stress Measurements

	Percent Change			
Groups	Month 1	Month 2	Month 3	Month 1 Pre with Month 3 Post
Company A	-27.4%	-33.2%	20.7%	1.9%
Company B	13.3%	6.0%	13.1%	26.6%
Whole Group	-2.8%	-11.3%	17.1%	16.3%

Note. (Month 1 N=14; Month 2 N=14; Month 3 N=15, Month 1 Pre-Month 3 Post N=11)
-% is an increase in stress measurement; +% is a decrease in stress measurement

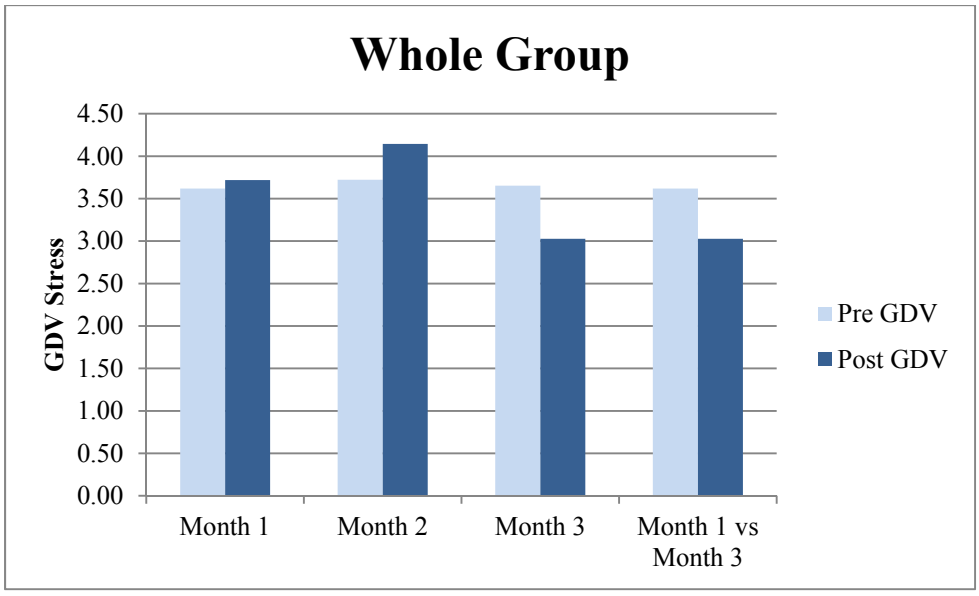

Figure 7. Company A and Company B combined participants' pre-post GDV stress measurements.

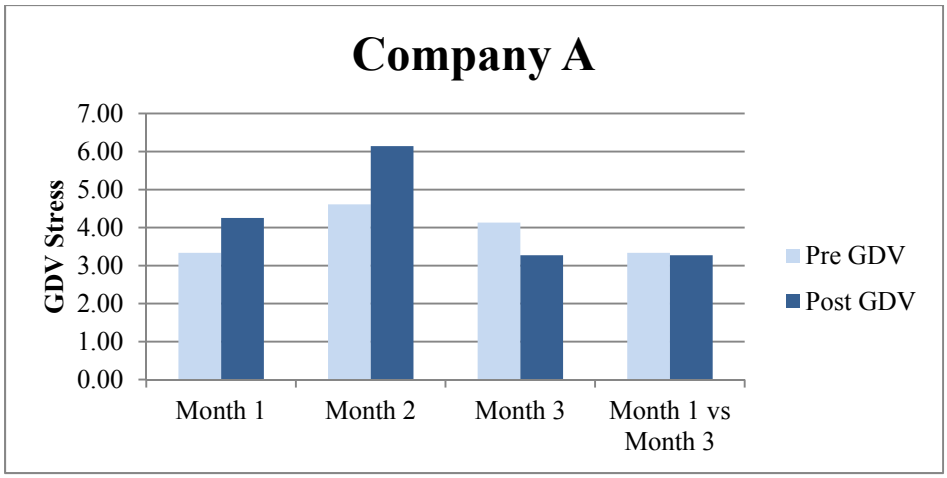

Figure 8. Company A combined participants' pre-post GDV stress measurements.

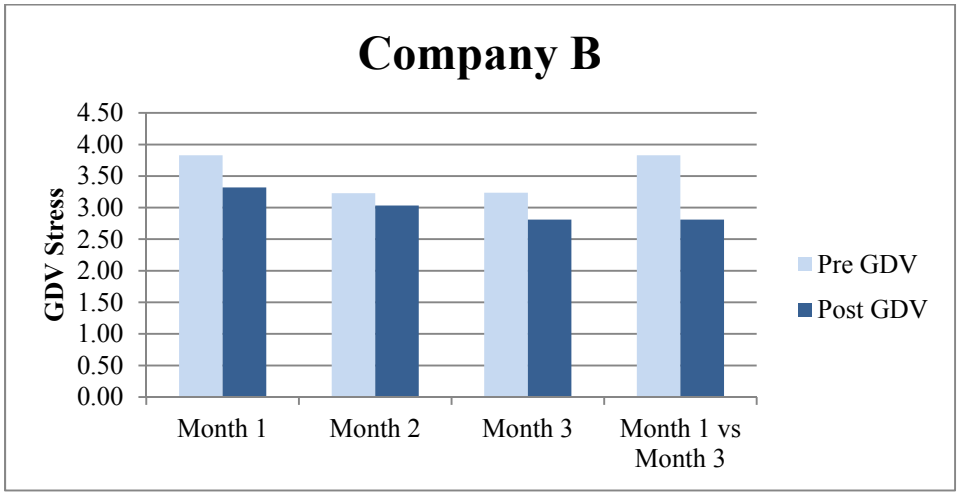

Figure 9. Company B combined participants' pre-post GDV stress measurements.

Additional quantitative data were analyzed to show each participant's percent change in stress measurements by month and also comparing Month 1 pre to Month 3 post measurements. The following data are presented by company and illustrate each group participant's percent changes.

Company A

Table 5 shows percent changes for Company A participants. Following Table 5 are bar graphs for each participant (Figures 10-17) showing the individual measurement percent changes for each month as well as Month 1 pre and Month 3 post interventions.

Table 5 illustrates Company A participants' percent changes in stress measurements for Month 1, Month 2, Month 3, and Month 1 pre intervention with Month 3 post intervention. Month 1 showed two participants with a decrease in stress and four participants with an increase in stress. Month 2 showed one person with a positive decrease in stress and four participants with a minus increase in stress. Month 3 showed five participants with a decrease in stress and two people with an increase in stress. Month 1 pre to Month 3 post intervention showed 3 people with a decrease in stress and two participants with an increase in stress.

Table 5

Company A Participants: GDV Pre-Post Percentage Increase/Decrease of Stress Measurements

	Percent Change			
Participants	Month 1	Month 2	Month 3	Month 1 Pre with. Month 3 Post
1A	6.3%	19.8%	9.8%	7.5%
2A	-41.9%		-1.3%	-28.2%
3A	3.4%	-108.2%	3.4%	11.4%
4A	-55.2%	-65.3%		
5A	-34.4%		44.9%	-13.0%
6A			-9.3%	
7A	-46.2%	-60.4%	20.8%	44.3%
11A		-5.2%	42.3%	

Note. (Month 1 N=6; Month 2 N=5; Month 3 N=7; Month 1 Pre with. Month 3 Post N=5) -% is an increase in stress measurement; +% is a decrease in stress measurement; blank cells denote no available measurement

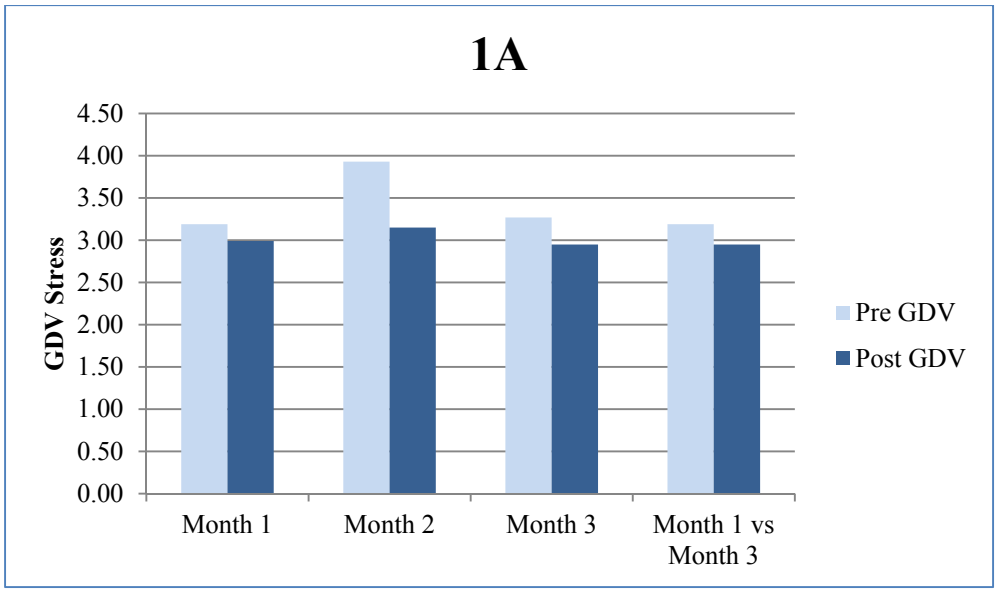

Figure 10. Participant 1A Company A pre-post GDV stress measurements.

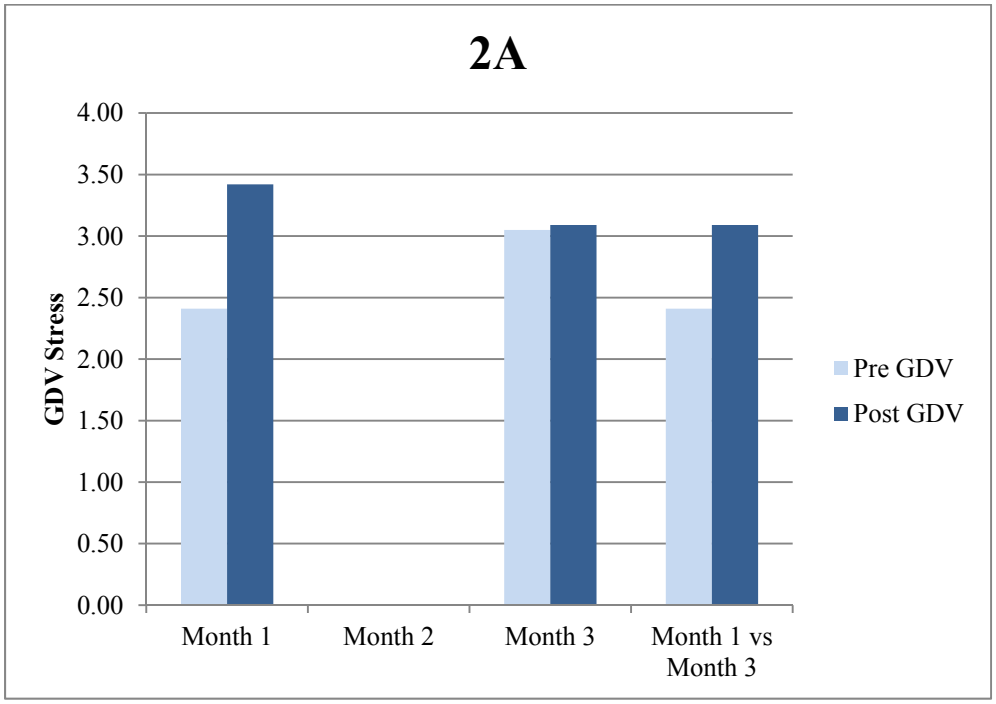

Figure 11. Participant 2A Company A pre-post GDV stress measurements.

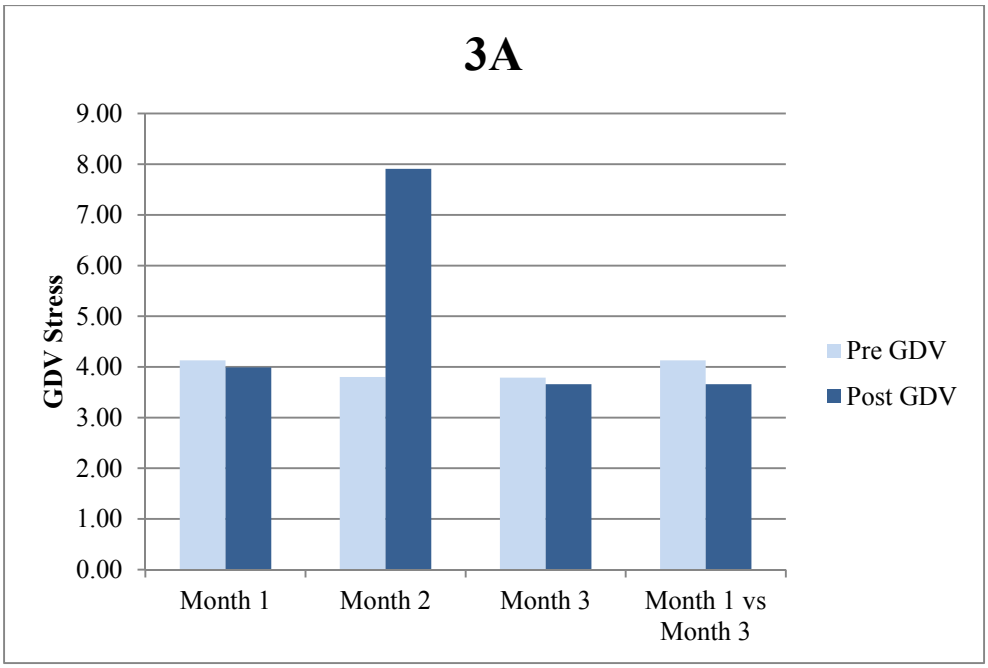

Figure 12. Participant 3A Company A pre-post GDV stress measurements.

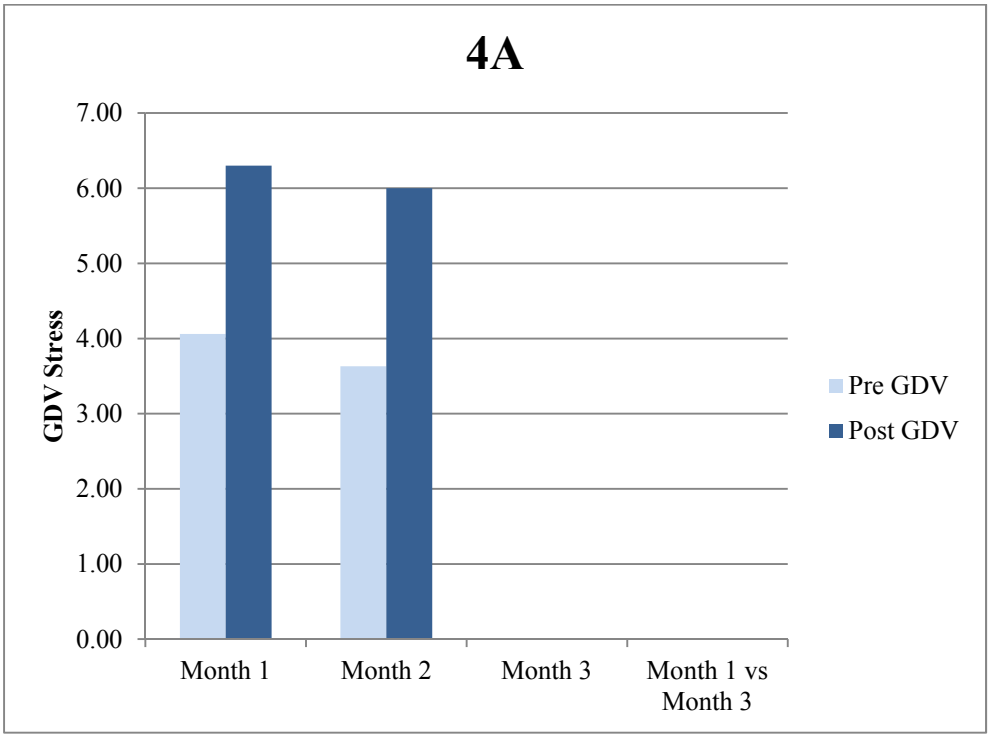

Figure 13. Participant 4A Company A pre-post GDV stress measurements.

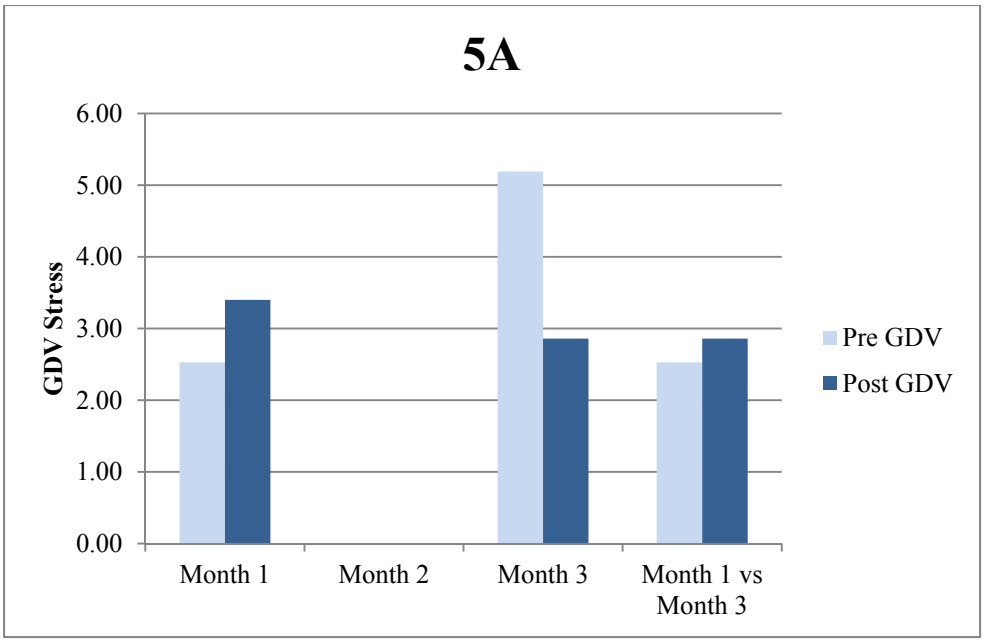

Figure 14. Participant 5A Company A pre-post GDV stress measurements.

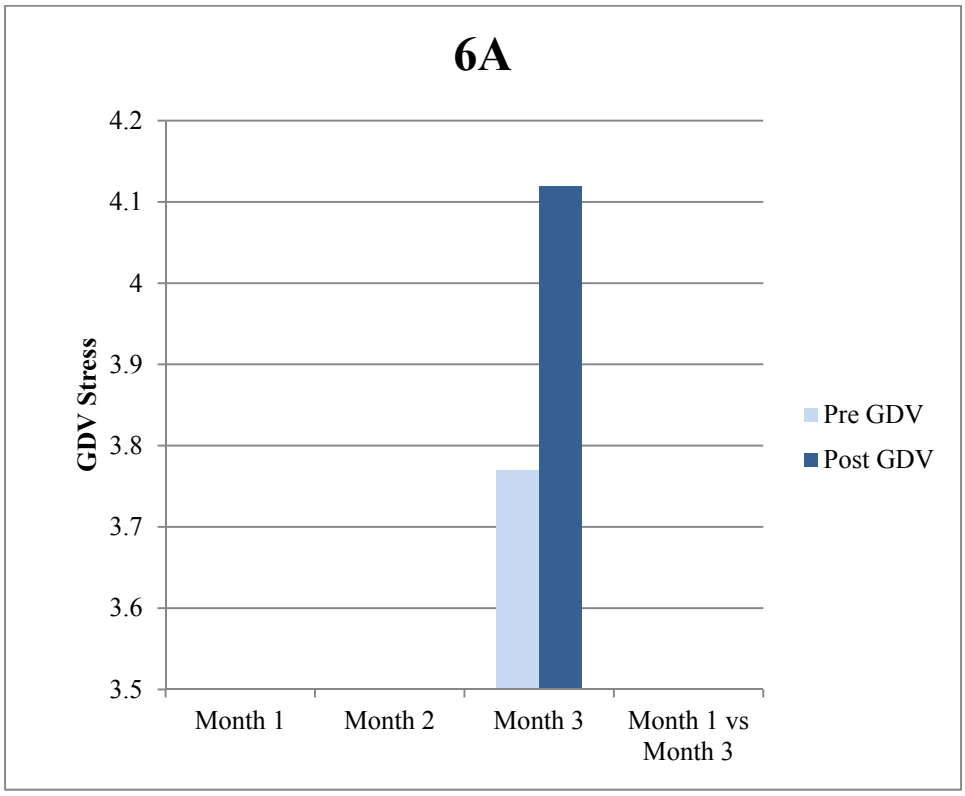

Figure 15. Participant 6A Company A pre-post GDV stress measurements.

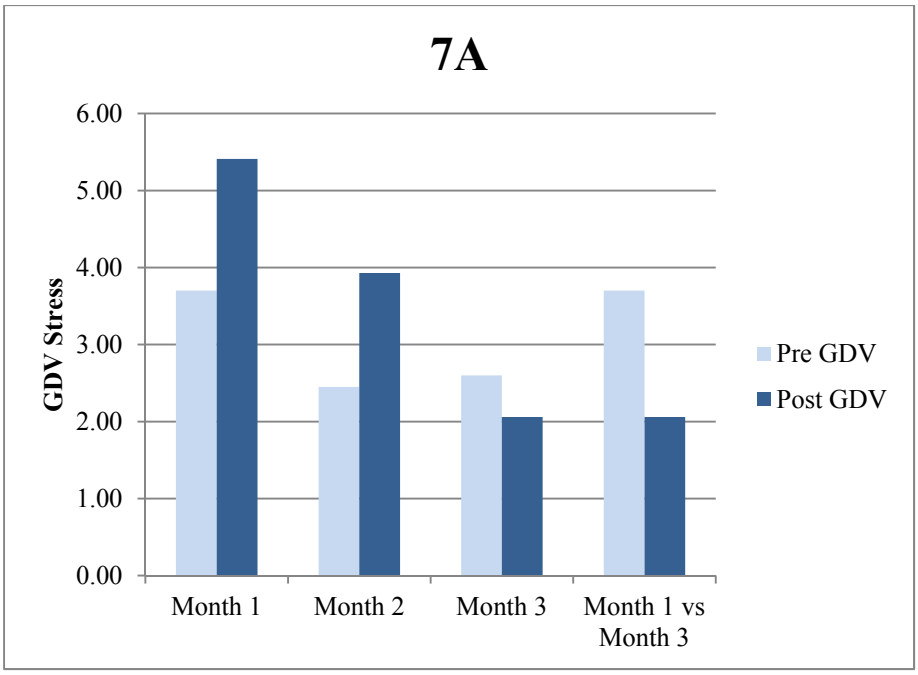

Figure 16. Participant 7A Company A pre-post GDV stress measurements.

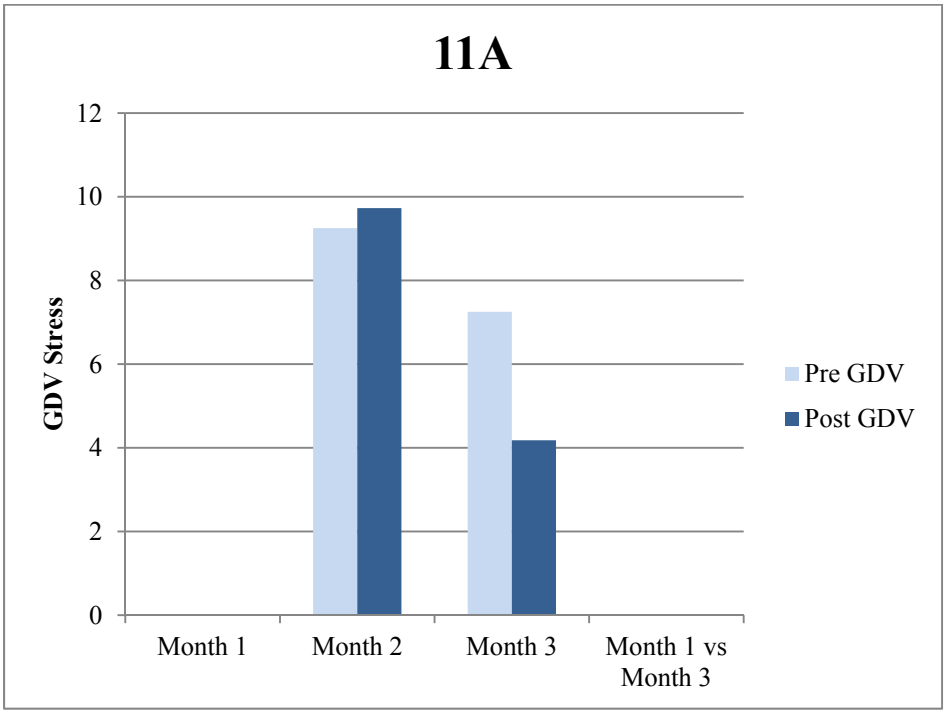

Figure 17. Participant 11A Company A pre-post GDV stress measurements.

Company B

Table 6 illustrates Company B participants' percent changes in stress measurements for Month 1, Month 2, Month 3, and Month 1 pre intervention with Month 3 post interventions. Following Table 6 are bar graphs for each company participant (Figures 18-28) showing the individual measurement percent changes for each month as well as Month 1 pre and Month 3 post interventions. As previously mentioned, blank cells indicate an absence in data collection. Month 1 showed six participants with a decrease in stress and two participants with an increase in stress. Month 2 showed six participants with a decrease in stress and three participants with an increase in stress. Month 3 showed five participants with a decrease in stress and three people with an increase in stress. Month 1 pre to Month 3 post intervention showed four people with a decrease in stress, one participant with an increase in stress, and one person with no change in stress.

Table 6

Company B Participants: GDV Pre-Post Percentage Increase/Decrease of Stress Measurements

	Percent Change			
Participants	Month 1	Month 2	Month 3	Month 1 Pre with Month 3 Post
1B		-27.9%	31.8%	
2B	32.8%	37.9%		
3B	12.1%	20.7%	25.6%	12.4%
4B			29.2%	
5B	22.4%	1.1%	-3.6%	46.0%
6B	20.9%	14.3%	27.7%	28.9%
7B	-13.7%			
8B	31.4%	-32.1%	20.4%	8.2%
9B	6.8%	24.7%	-9.5%	0.0%
10B	-5.5%	-60.2%	-36.3%	-8.7%
11B		27.9%		

Note. (Month 1N=8; Month 2 N=9; Month 3 N=8; Month 1 Pre with Month 3 Post N=6) -% is an increase in stress measurement; +% is a decrease in stress measurement; blank cells denote no available measurement

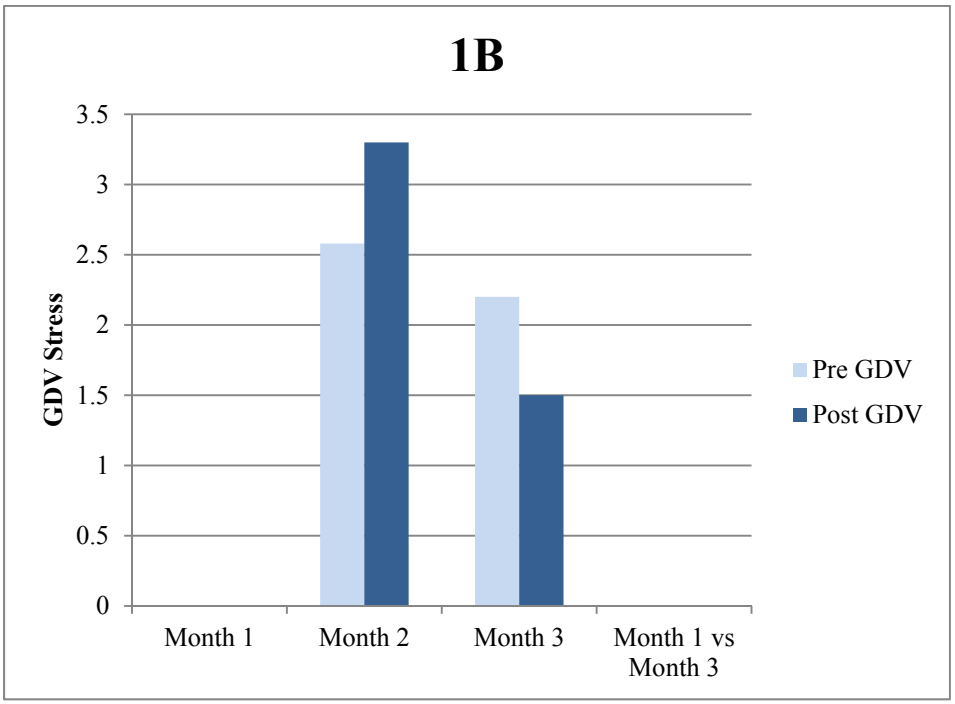

Figure 18. Participant 1B Company B pre-post GDV stress measurements.

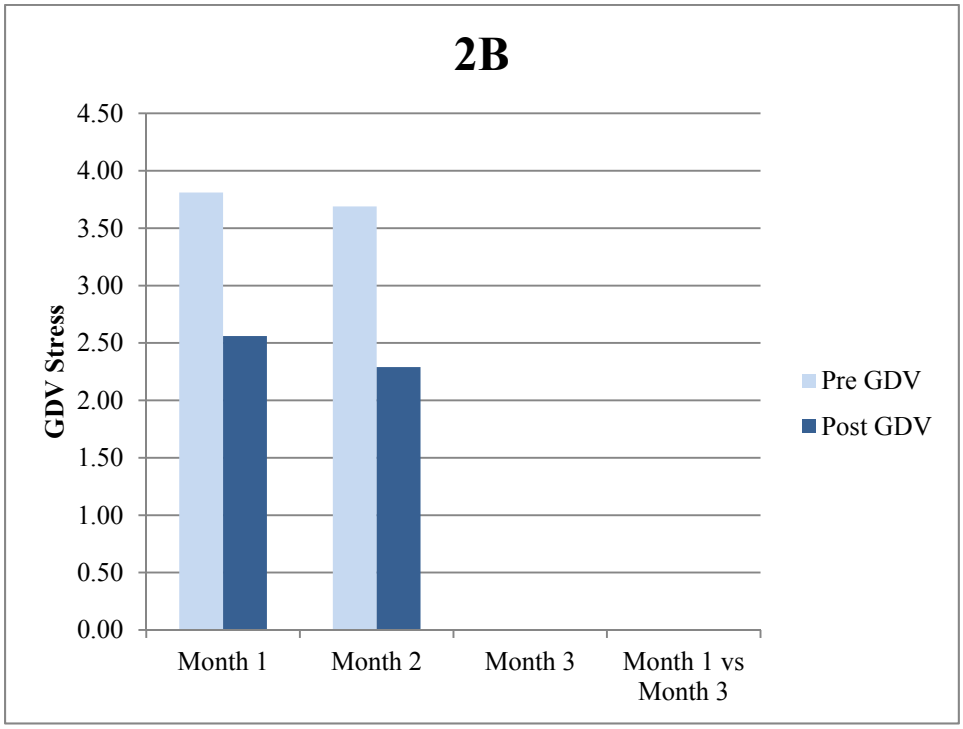

Figure 19. Participant 2B Company B pre-post GDV stress measurements.

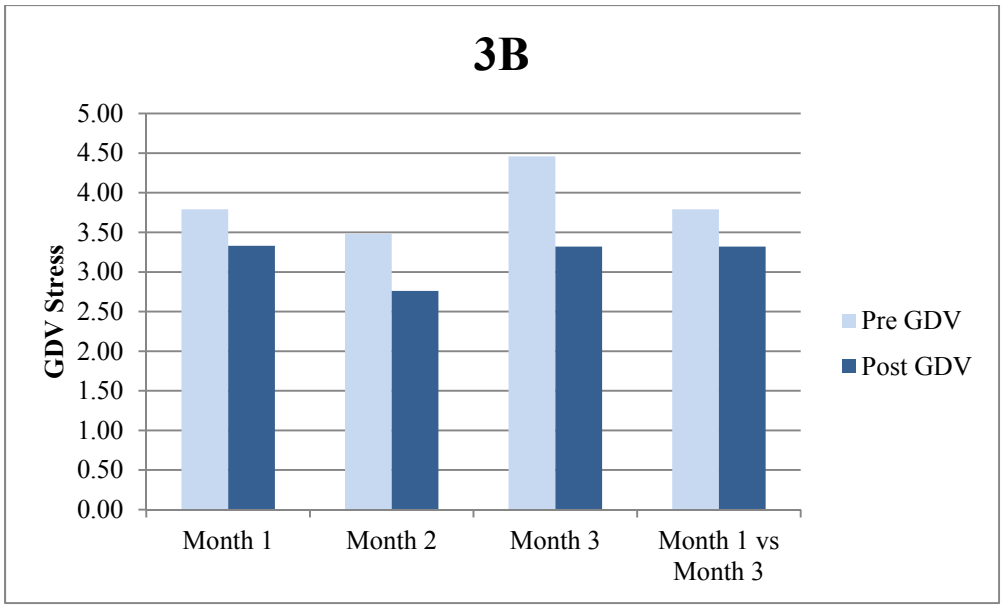

Figure 20. Participant 3B Company B pre-post GDV stress measurements.

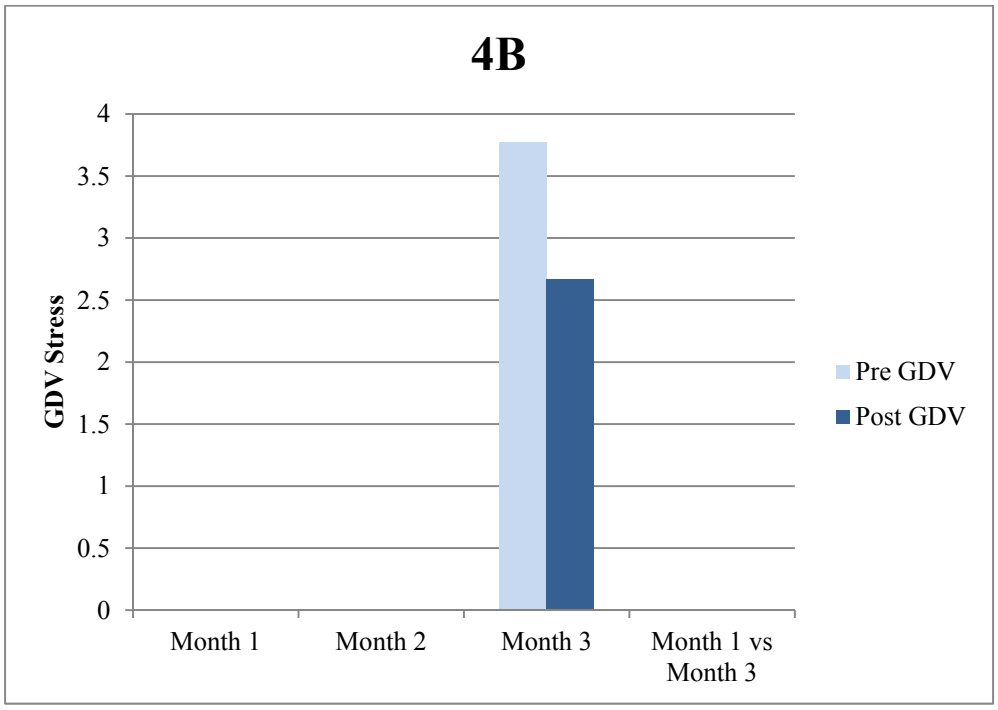

Figure 21. Participant 4B Company B pre-post GDV stress measurements.

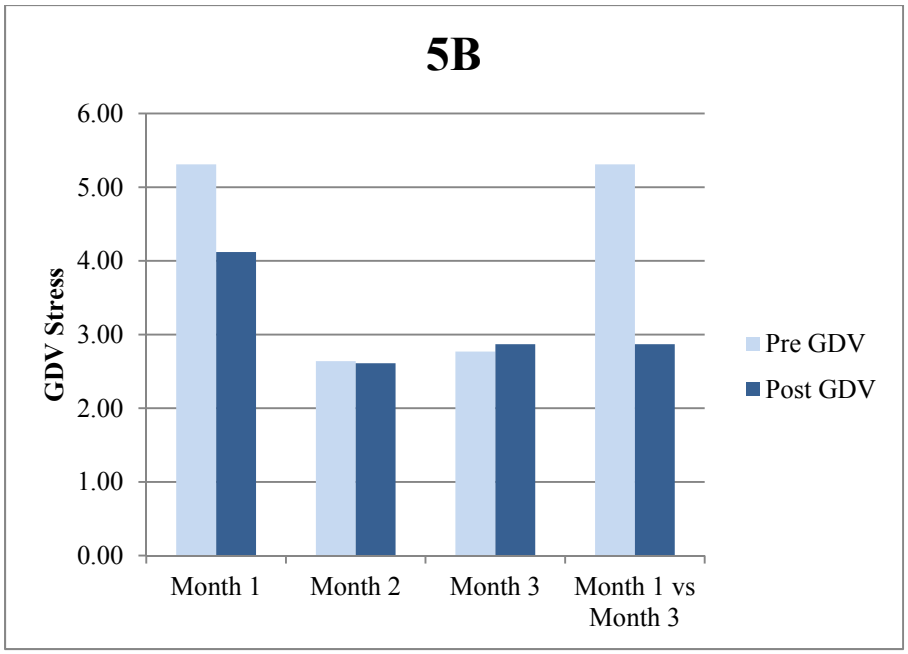

Figure 22. Participant 5B Company B pre-post GDV stress measurements.

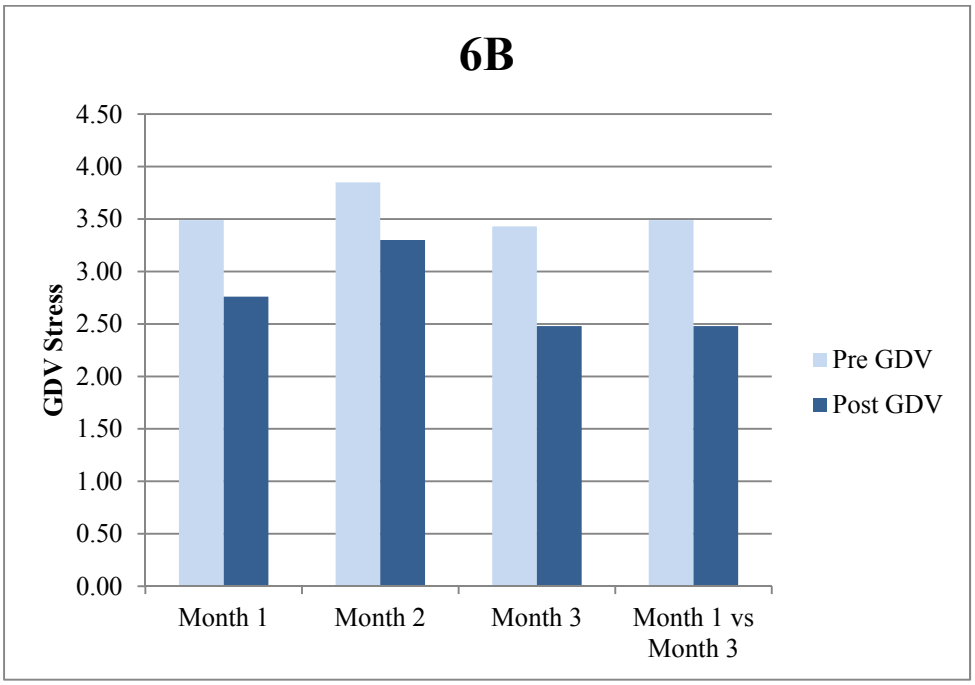

Figure 23. Participant 6B Company B pre-post GDV stress measurements.

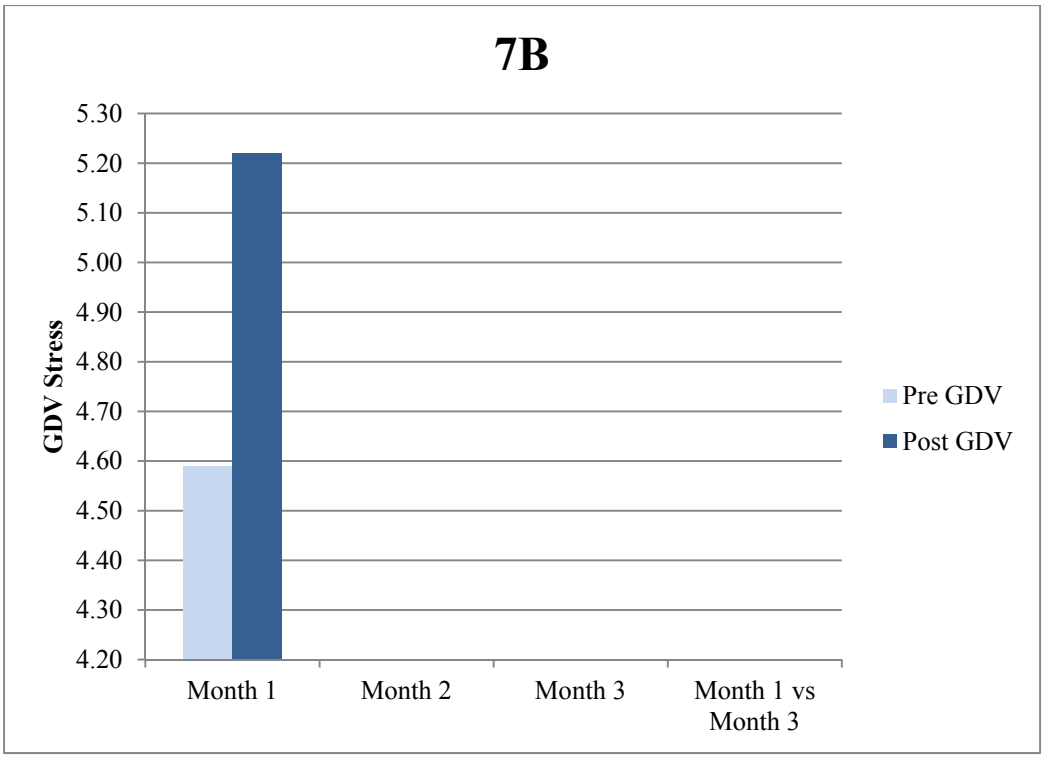

Figure 24. Participant 7B Company B pre-post GDV stress measurements.

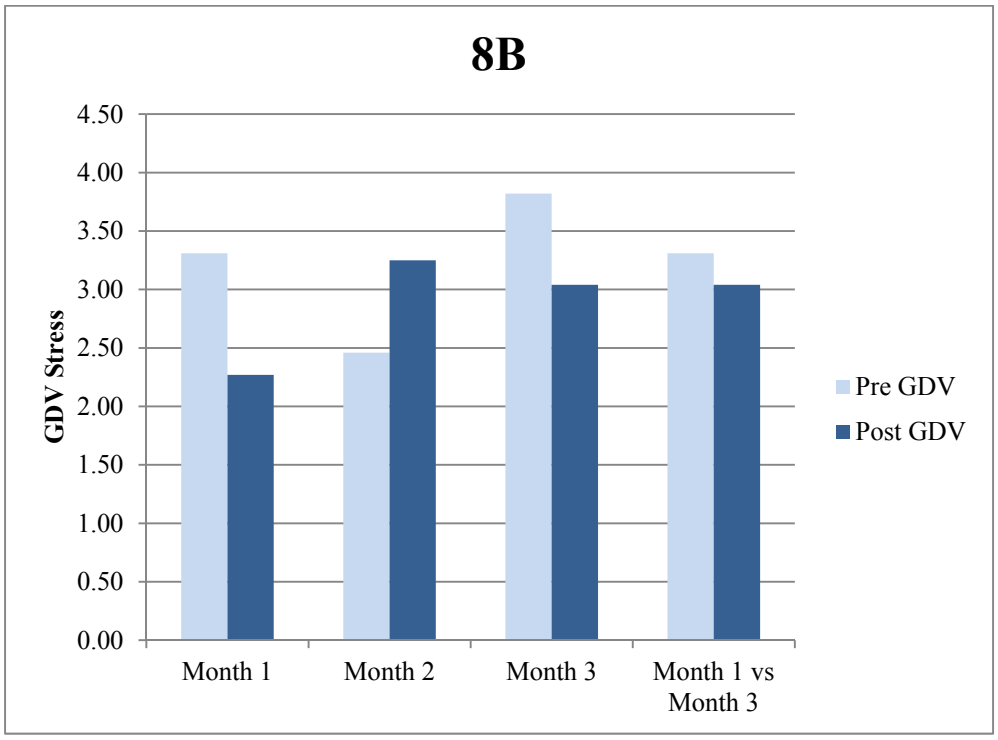

Figure 25. Participant 8B Company B pre-post GDV stress measurements.

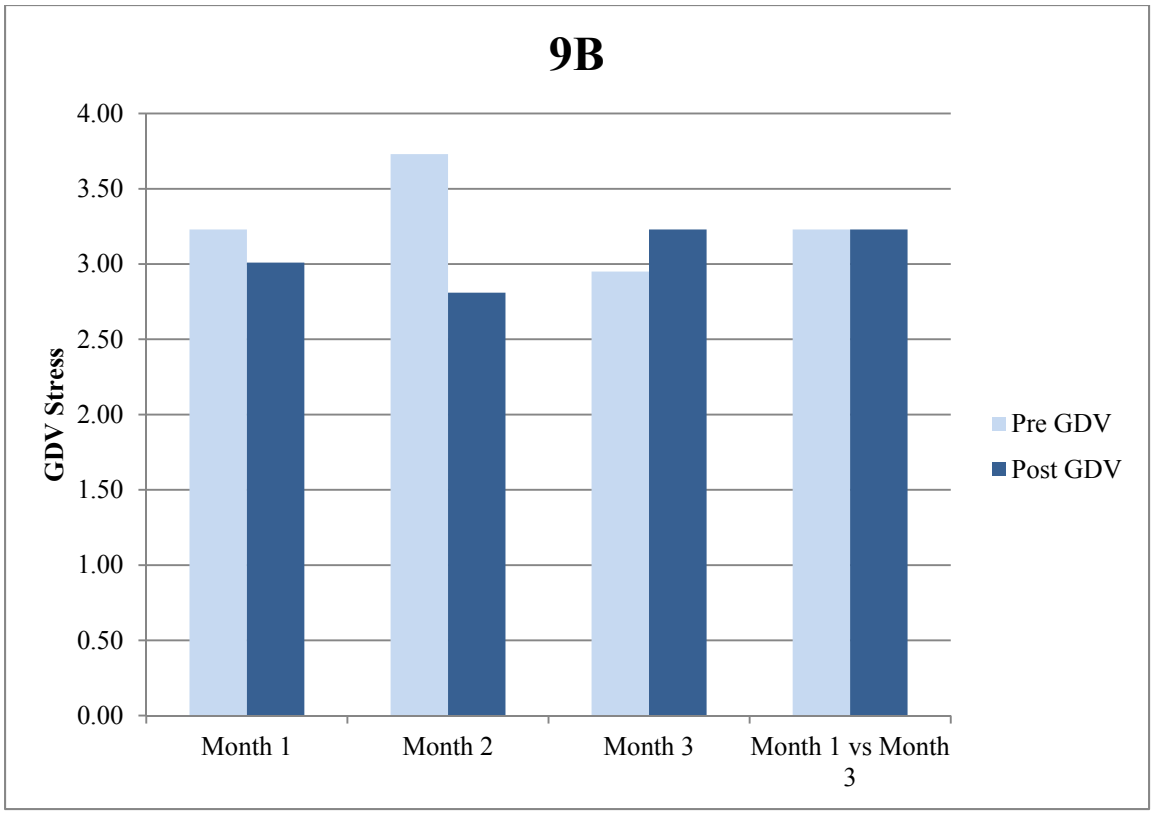

Figure 26. Participant 9B Company B pre-post GDV stress measurements.

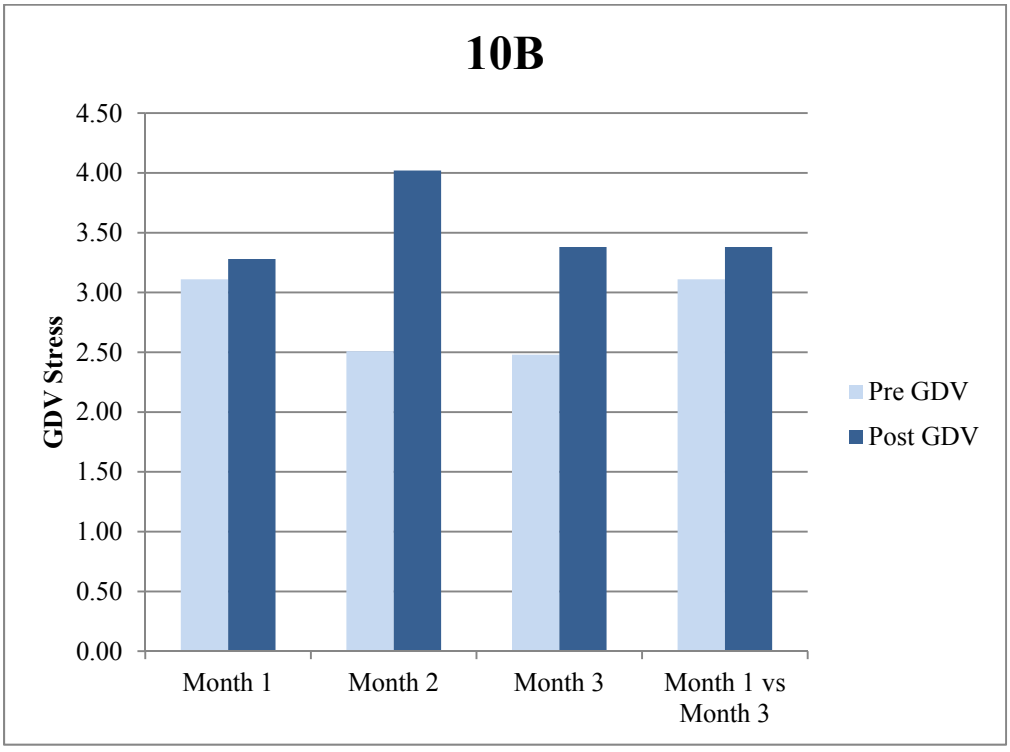

Figure 27. Participant 10B Company B pre-post GDV stress measurements.

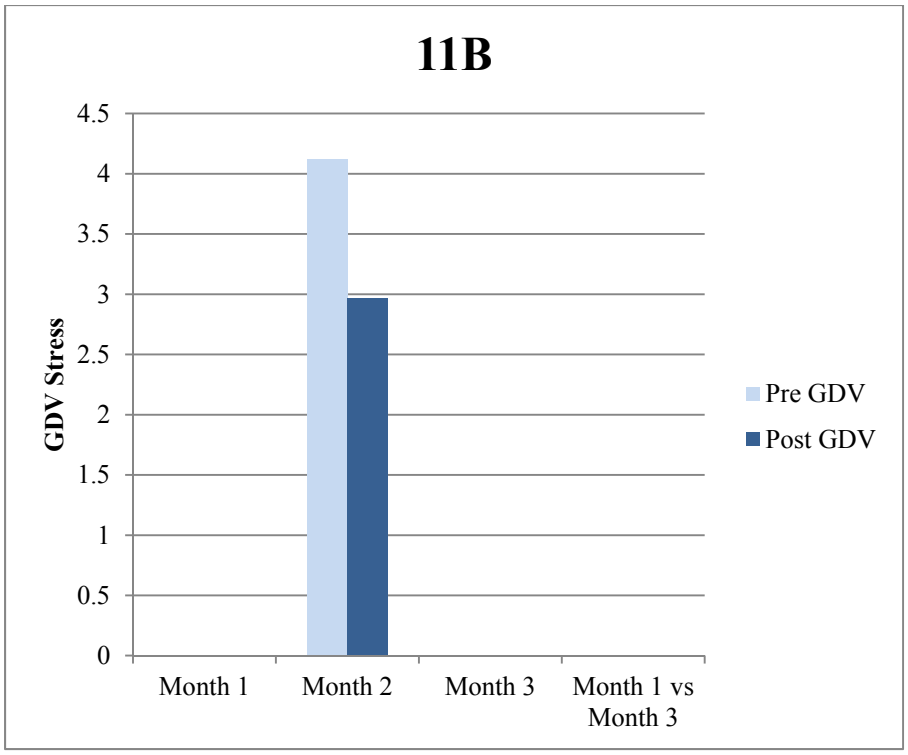

Figure 28. Participant 11B Company B pre-post GDV stress measurements.

Qualitative Data Results

Data related to factors affecting employee stress were analyzed using Creswell's (2009) six-stage process for analyzing qualitative data. After exhausting the coding, the data were re-reviewed, generating primary themes and interconnected sub themes. This process was followed for the three qualitative datasets: participant free writing, participant follow-up interviews, and manager pre-post interviews.

Participant free writing. Initial analysis of participant responses resulted in theme clusters generated to describe stress levels experienced by the participants. As the participant responses were compiled and categorized, five category clusters began to emerge: Organizational Stressors, Personal Stressors, Employee Stressors, Favorable Aftereffects, and Adverse Aftereffects. Clustering of these categories is presented in Table 7.

Table 7

Clustering of Categories

Category	Themes
Organizational Stressors	1. Unbalanced workload 2. Unsupportive environment
Personal Stressors	1. Work-life balance 2. Life events 3. Family
Employee Stressors	1. Difficulty concentrating 2. Difficulty performing job duties 3. Inability to manage time 4. Physical ailments 5. Emotional ailments 6. Avoiding activities
Favorable Aftereffects	1. Decreased stress 2. Focused and energized 3. Employment continues 4. Uses MBSR techniques throughout the day
Adverse Aftereffects	1. Stress continues 2. Unfavorable coping habits

Note. Category clusters are presented in the order of stressor to intervention aftereffects from the participant free writes.

Systematic grouping within and between categories based on patterns, similarities, and on the past literature was achieved through coding of context categorizing participant responses. Participants' word frequency is shown in Figure 29, which illustrates the most frequent words used in the free writes.

Several themes were developed to describe data within primary themes across participant responses. These themes are listed in Table 7. The five primary themes presented appear to be the major factors that affect employee stress and are congruent with findings of the literature review.

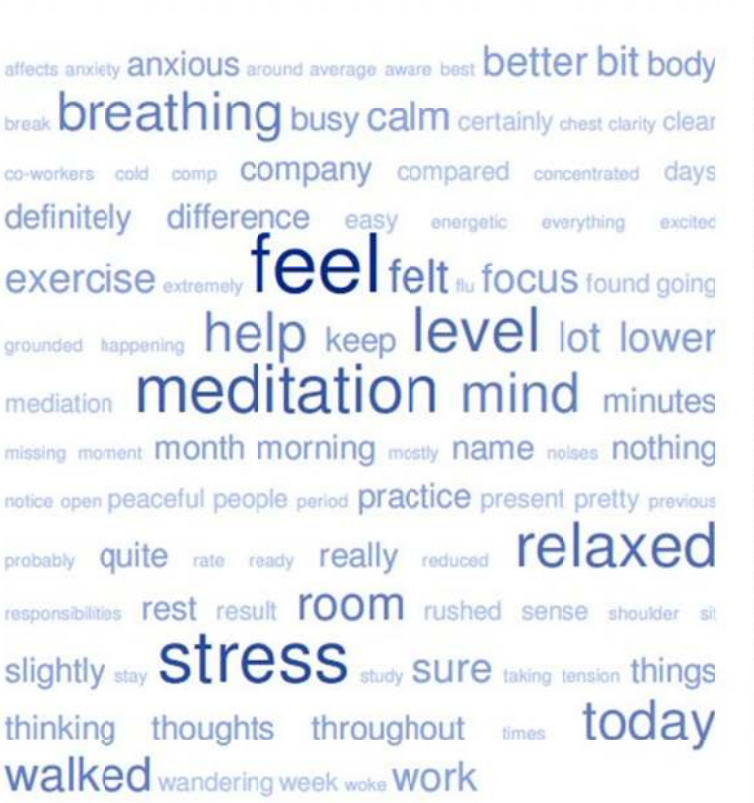

Figure 29. Frequency tag cloud showing the most frequent 100 words and their synonyms from the combined participant free writes.

In each month of the study, immediately after the MBSR breathing intervention, participants responded to a free write question "How does your stress level compare to when you walked into the room?" This question was designed by the researcher to elicit information about the self-perception of employee stress. In Month 1, 18 participants completed the free write. Responses varied in number for each category with 11 responses for organizational stressors, 5 responses reflected personal stressors, 8 responses linked to employee stressors, 15 responses regarding favorable aftereffects, and 2 responses indicating undesirable aftereffects. In Month 2, 14 participants completed the self-reported free write. As in Month 1, responses varied in number for each category with three responses for organizational stressors, seven responses reflected personal

stressors, 14 responses linked to employee stressors, 23 responses regarding favorable aftereffects, and two responses indicating undesirable aftereffects. In Month 3, 15 participants completed the free write. Again, responses varied in number for each category with 5 responses for organizational stressors, 4 responses reflected personal stressors, 13 responses linked to employee stressors, 18 responses regarding favorable aftereffects, and 2 responses indicating undesirable aftereffects.

Participant follow-up interviews. Participant follow-up interviews were scheduled 1 week after the final on-site data collection month. Out of 17 possible interviews, the researcher conducted 16 actual interviews. The researcher left three voice messages for one participant without successfully scheduling the interview. A total of 16 follow-up participant interviews were scheduled at each for 30 minutes. A total of eight open-ended questions (Appendix B) were asked and all participants responded to all questions. Several categories were developed to describe data within and across participant responses. The six primary categories with their corresponding themes are listed in Table 8. Participants' word frequency is shown in Figure 30, which illustrates the most frequent words used in the follow-up interviews.

Table 8

Participant Follow-up Interview Categories

Question #	Responses	Categories	Themes
1	N=15 yes	Organization Stressors	1. Unbalanced workload
	N=1 no	Employee Stressors	2. Difficulty concentrating
			3. Time management
			4. Difficulty performing job duties
			5. Physical Ailments
			6. Emotional Ailments
2	N=14 Coping	Favorable Coping	1. Stress decreased
	N= 2 No coping	Unfavorable Coping	2. Stress continues

continued

Question #	Responses	Categories	Themes
3	N=14 Learning Stress Management Techniques N=2 To participate in a study	Favorable Coping Favorable Coping	1. Favorable techniques 2. Helping others
4	N= 5 Commitment to Practice N=13 personal benefits N=2 company benefits	Both Favorable and Unfavorable Coping Favorable Coping	1. Daily practice 2. Concentration and awareness 3. Recharged and refreshed 4. Good for the company
5	N= 9 use it N= 7 do not use it (N= 5 will be)	Favorable Coping Unfavorable Coping	1. Appreciate benefits 2. Do not practice; developing a new habit
6	N=16	Favorable Coping	1. Tools 2. Skills
7	N=6 Try it N= 8 Helpful N=1 Simple N=1 Takes practice	Favorable Coping Favorable Coping	1. Valuable 2. Helpful 3. Natural
8	N=16 Additional Comments	Personal Company	Personally rewarding Company benefited

Note. Category clusters are presented in the order of the presentation of the open-ended interview questions.

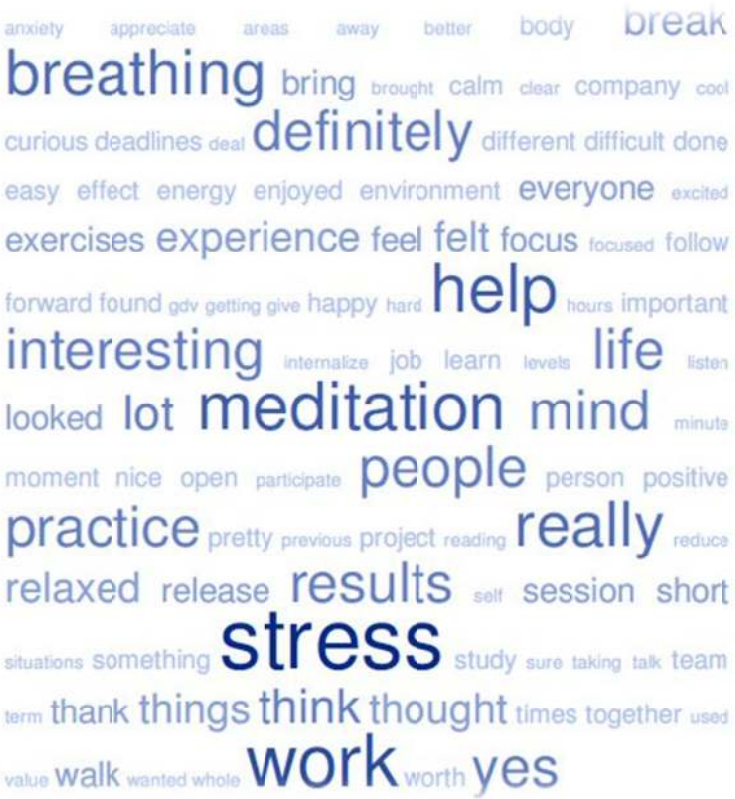

Figure 30. Frequency tag cloud showing the most frequent 100 words and their synonyms from the participant follow-up interviews.

From the eight follow-up interview questions, Questions 4 and 7 resulted in some participants providing multiple category descriptors. Question 1 resulted in 15 participants confirming that they experience employee stress, whereas one person indicated not experiencing employee stress. For Question 2, 14 participants indicated specific favorable coping techniques and two people shared unfavorable coping techniques. For Question 3, reason for participating in the study, 14 participants described the desire to learn techniques to reduce employee stress and two people shared a desire to volunteer. Question 4 found that five participants learned a commitment to practice, 13 participants obtained personal benefits, and two people perceived that the intervention yielded company benefits. For Question 5, nine participants stated that they used the breathing technique whereas seven people stated that they do not use it; however, five of the seven indicated that they will be using it. In Question 6 all 16 participants indicated that they learned something as a result of experience participating in the study. For Question 7, all 16 participants indicated they would recommend this program to others. Question 8 included additional comments and information from all 16 participants.

Manager pre and post follow-up interviews. Manager pre follow-up interviews were scheduled 1 week prior to the first onsite data collection. Post follow-up interviews were scheduled 1 week after the last onsite data collection. Telephone interviews were scheduled at 30-minute intervals. There were a total of six pre and post manager interviews. A total of four open ended questions (Appendix A) for the pre interview and five open ended questions for the post interview were asked and all managers responded to all questions. Managers' word frequency is shown in Figure 31, which illustrates the

most frequent words used in the managers' interviews. Several categories were developed to describe data within and across management responses. The five primary categories with their corresponding themes are presented in Table 9.

Figure 31. Frequency tag cloud showing the most frequent 50 words and their synonyms from the manager pre-post interviews.

Table 9

Pre and Follow-up Manager Interview Categories

Category	Themes
Employee Stress	1. Organizational Stressors
	2. Employee Stressors
Coping	1. Favorable techniques
	2. Unfavorable techniques
Responsibility	1. Aware
	2. Acknowledge
	3. Address
Intervention	1. Employee wellbeing
	2. Employee productivity
Choices	3. Practice
	Non-practice

Note. Category clusters are presented in the order of the presentation of the open-ended interview questions.

Three managers participated in this research project. Each manager answered all of the pre and post interview questions. One manager was out of the office during Month 1 and returned for Month 3. The other two managers were in the office for all 3 months of participant data collection. All managers reported witnessing employee stress and employee coping techniques, took personal responsibility to address employee stress and provide a stress intervention, shared the importance of choices supporting practicing intervention techniques, and recognized the consequences of not practicing intervention techniques.

Mixed Methods Results

Both methods of data collection and analysis were necessary to develop the most thorough answers to the research questions. Collecting and analyzing the data simultaneously provided the opportunity to delve into interesting as well as unexpected quantitative and qualitative results. For example, when considering only the quantitative findings, an increase in post intervention employee GDV stress measurements would not

be expected. Hints of employee perceived stress were indicated in the post intervention self-reported free writes. For example, hint included: being preoccupied, difficulty of focusing, feeling rushed, and tension in the body. For this reason, it was unexpected to that the qualitative data revealed that the majority of the participants indicated both perceived stress and specific stressors within the free writes. This led the researcher to conduct the mixed methods analysis in two processes: Level 1 and Level 2. Both level analyses involved quantifying the qualitative data as dictated by Creswell's (2009) data transformation approaches. These procedures involved creating codes and themes qualitatively and then counting frequency of occurrence in the text data. According to Creswell, the "quantification of qualitative data then enables a research to compare quantitative results with the qualitative data" (p. 218).

Level 1 mixed methods results. For Level 1, a numerical code was used to quantify qualitative data: -1 for an increase in perceived stress, 0 for no change in perceived stress, and +1 for a decrease in perceived stress. In the qualitative data, if the participant indicated a decrease in stress, then the data were coded with a +1. If the participant indicated no change, then the data were coded with a 0. If the participant indicated an increase in stress, then the data were coded with a -1. This coding structure is consistent with the previous quantitative data analysis identifying changes in GDV stress pre-post measurements. Comparing GDV stress changes to the Level 1 quantified free writes indicated no correlation in all combined months, the comparison between Month 1 and Month 3 is inconclusive because the *p* value is too high, and Month 2 showed a weak correlation. Analyses were conducted by whole group for all months and whole group for Month 1, Month 2, and Month 3.

Table 10

Correlations Level 1: Whole Group All Months

		Coded Quantitative	Coded Qualitative
Coded Quantitative	Pearson Correlation	1	.069
	Sig. (2-tailed)		.660
	N	43	43
Coded Qualitative	Pearson Correlation	.069	1
	Sig. (2-tailed)	.660	
	N	43	43

Note. There is no correlation and no significance. p= <.05; exploratory p=<.10

Table 11

Correlations Level 1: Whole Group Month 1

		Month 1 Coded Quantitative Data	Month 1 Coded Qualitative Data
Month 1 Coded Quantitative Data	Pearson Correlation	1	-.240
	Sig. (2-tailed)		.408
	N	14	14
Month 1 Coded Qualitative Data	Pearson Correlation	-.240	1
	Sig. (2-tailed)	.408	
	N	14	14

Note. There is no correlation and no significance. p= <.05; exploratory p=<.10

Table 12

Correlations Level 1: Whole Group Month 2

		Month 2 Coded Quantitative Data	Month 2 Coded Qualitative Data
Month 2 Coded Quantitative Data	Pearson Correlation	1	.522
	Sig. (2-tailed)		.055
	N	14	14
Month 2 Coded Qualitative Data	Pearson Correlation	.522	1
	Sig. (2-tailed)	.055	
	N	14	14

Note. There is a weak correlation and is statically significant. p= <.05

Table 13

Correlations Level 1: Whole Group Month 3

		Month 3 Coded Quantitative Data	Month 3 Coded Qualitative Data
Month 3 Coded Quantitative Data	Pearson Correlation	1	-.082
	Sig. (2-tailed)		.771
	N	15	15
Month 3 Coded Qualitative Data	Pearson Correlation	-.082	1
	Sig. (2-tailed)	.771	
	N	15	15

Note. There is no correlation and no significance. p=<.05; exploratory p=<.10

As a result of using a p level of .05 and conducting correlational statistics, no correlations or statistically significant differences (p <.05) were found between quantitative and quantified qualitative data for Month 1 and Month 3; however, a weak correlation and statistical significance was found for Month 2.

Level 2 mixed methods results. In the qualitative data, if the participant indicated a favorable aftereffect, then the data were coded with a +1. If the participant indicated neither a favorable or unfavorable aftereffect, then the data were coded with a 0. If the participant indicated an unfavorable aftereffect, then the data were coded with a -1. This coding structure is consistent with the previous quantitative data analysis identifying changes in GDV stress pre-post measurements as well as Level 1 analysis. Comparing GDV stress changes to the Level 2 quantified free writes indicated correlations between the GDV stress measurements and post intervention qualitative data. Analyses were conducted by whole group for all months and by group for Month 1, Month 2, and Month 3.

Table 14

Correlations Level 2: Whole Group All Months

		Coded Quantitative	Coded Qualitative
Coded Quantitative	Pearson Correlation	1	.824**
	Sig. (2-tailed)		.000
	N	43	43
Coded Qualitative	Pearson Correlation	.824**	1
	Sig. (2-tailed)	.000	
	N	43	43

Note. There is a strong correlation and is statistically significant.
** Correlation is significant at the 0.01 level (2-tailed).

Table 15

Correlations Level 2: Whole Group Month 1

		Month 1 Coded Quantitative Data	Month 1 Coded Qualitative Data
Month 1 Coded Quantitative Data	Pearson Correlation	1	.812**
	Sig. (2-tailed)		.000
	N	14	14
Month 1 Coded Qualitative Data	Pearson Correlation	.812**	1
	Sig. (2-tailed)	.000	
	N	14	14

Note. There is a strong correlation and is statistically significant.
** Correlation is significant at the 0.01 level (2-tailed).

Table 16

Correlations Level 2: Whole Group Month 2

		Month 2 Coded Quantitative Data	Month 2 Coded Qualitative Data
Month 2 Coded Quantitative Data	Pearson Correlation	1	.937**
	Sig. (2-tailed)		.000
	N	14	14
Month 2 Coded Qualitative Data	Pearson Correlation	.937**	1
	Sig. (2-tailed)	.000	
	N	14	14

Note. There is a very strong correlation and is statistically significant.
** Correlation is significant at the 0.01 level (2-tailed).

Table 17

Correlations Level 2: Whole Group Month 3

		Month 3 Coded Quantitative Data	Month 3 Coded Qualitative Data
Month 3 Coded Quantitative Data	Pearson Correlation	1	.707**
	Sig. (2-tailed)		.003
	N	15	15
Month 3 Coded Qualitative Data	Pearson Correlation	.707**	1
	Sig. (2-tailed)	.003	
	N	15	15

Note. There is a correlation and is statistically significant.
** Correlation is significant at the 0.01 level (2-tailed).

As a result of using a p level of .05 and conducting correlational statistics, correlations and a statistically significant difference (p <.05) were found between quantitative and quantified qualitative data for Month 1, Month 2, and Month 3 with Month 2 showing the strongest correlation.

Summary

This chapter presented the results for quantitative, qualitative, and mixed methods data. The statistical quantitative results were presented in terms of change in pre and post intervention GDV stress measurements for the whole group, by group, and for individuals. The quantitative data showed an absence of a significant difference when comparing whole group pre and post GDV stress measurements for Month 1 and Month 2. A significant difference was found in Month 3 along with a borderline close significance for comparing whole group Month 1 pre to Month 3 post intervention. Although the data showed no statistical significance, the data indicated an increase in whole group stress for Month 1 and Month 2, whereas Month 3 and Month 1 pre to

Month 3 post indicated a reduction in stress. In addition, the percent change of mean scores with GDV stress levels increased for Company A within Month 1 and Month 2; however, stress levels decreased in Month 3 as well as comparing Month 1 pre to Month 3 post intervention. The percent change of mean scores with GDV stress levels for Company B decreased for Month 1, Month 2, and Month 3, as well as when comparing Month 1 pre to Month 3 post interventions. The lack of statistical significance and differences in changes in Company A compared to Company B led the researcher to examine GDV stress level change percentages by individual. In Month 1 8 participants' GDV stress levels decreased whereas 6 participants' GDV stress levels increased. For Month 2, seven participants' stress levels decreased and 7 participants' stress levels increased. Within Month 3, 10 participants' GDV stress levels decreased and 5 participants' stress levels increased. In comparing Month 1 pre to Month 3 post, GDV stress level percentages decreased for 7 participants, increased for 1 participant, and 1 participant saw no change.

The qualitative findings supported the mixed quantitative findings as the participants mentioned changes in stress as well as specific stress stressors. All participants acknowledged experiencing stress at work. Furthermore, all managers stated that they had witnessing employee stress among their workgroups. The participant self-report free write qualitative results revealed the stressors and aftereffects of employee stress. The six categories that emerged were organizational stressors, personal stressors, employee stressors, favorable aftereffects and adverse aftereffects. The participant follow-up interviews qualitative results presented the stressors and the favorable and unfavorable coping mechanisms used to reduce employee stress. The six categories

included: organizational stressors, employee stressors, favorable coping, unfavorable coping, personal benefits, and company benefits. The manager interviews results revealed the effects of employee stress. The five categories that arose were employee stress, coping, responsibility, intervention, and choices.

The mixed methods findings were presented in terms of correlational statistics. Following Creswell's (2009) processes to quantify the qualitative data, the researcher conducted correlational statistics in two levels: Level 1 correlating GDV stress pre-post differences with post intervention self-reported stress levels, and Level 2 correlating GDV stress pre-post differences with post intervention self-reported indicated stressors. The statistical quantitative results were presented in terms of statistical correlation for the whole group for all months and then whole group by month. Level 1 whole group for all months indicated no correlation and no significance. Level 1 whole group Month 2 showed a weak correlation and a statistical significance. Level 1 whole group Month 3 indicated no correlation and no significance. For Level 2, whole group with all months showed a strong correlation and statistical significance. Level 2 Month 1 indicated a strong correlation as well as a strong statistical significance. Furthermore, Level 2 Month 3 indicated a correlation and statistical significance.

The next chapter presents an interpretation and discussion of the results followed by the conclusions and summaries regarding the findings, additional findings linked to the relevant research, limitations and implications of the study, and recommendations for future research.

Chapter 5: Discussion

In this chapter, the major results and findings of the study are discussed. In addition, the limitations faced while conducting the study are presented. The chapter also addresses some implications for employee stress interventions, organization development, and mixed methods research. The final section of this chapter provides suggestions for future research.

This study resulted in a deeper understanding of measuring employee stress using the GDV camera presenting quantitative data, qualitative self-reported free writes, and effectiveness of the 10-minute MBSR breathing intervention in reducing employee stress. The quantitative data alone addresses research Question 1, whereas a comparison of quantitative and qualitative data addresses research Question 2. To recall, the research questions were:

1. What effect does a 10-minute stress management intervention, used once per month for 3 consecutive months have on employee stress among members of a work team within the workplace?
2. How do the GDV camera stress measurements compare with qualitative, self-reports of stress?

Quantitative Discussion

As shown in the results section, the Whole Group paired samples test indicated months where the MBSR breathing intervention did not show a statistically significant reduction in stress in Months 1 and 2. Given that the p value is too high, the research cannot determine if the MBSR breathing intervention was successful or not. To illustrate this point, if the mean difference for both pre and post GDV stress was -1.00 and the p

value was statistically significant, then the research could conclude the MBSR breathing intervention was ineffective. In contrast, if the mean difference was +1.00 and the *p* value was statistically significant, then the researcher could conclude the MBSR breathing intervention was effective. Therefore, for the results in Month 1 and Month 2, the information is inconclusive, whereas for Month 3 and the comparison between Month 1 Pre and Month 3 Post, the data found the MBSR breathing intervention to be an effective stress-reduction intervention. The discrepancy of information led the researcher to calculate the change in percentages of the stress measurements by company using Excel. The quantitative story unfolds with Company A showing consistency with the Whole Group. However, Company B showed a percent decrease for all months including Month 1 Pre to Month 3 Post. Therefore, Company B's percentage decrease indicates that the 10-minute MBSR breathing intervention was effective in reducing stress. This led the researcher to calculate the paired *t* test for each company in SPSS; however, the SPSS software did not recognize the significance values given the small sample size for each company.

The researcher kept looking for a deeper understanding of the quantitative data, which led to the exploration of examining percentage changes by company participant. A challenge experienced with collecting the data was absence of participants and possible data collection; in other words, not every individual was present for all 3 months. In Company A, participants 1A, 3A, and 7A were present for all 3 months. Participant 1A showed a percentage decrease of stress for all 3 months as well as for the Month 1 Pre to Month 3 Post comparison. Thus, this information suggests the 10-minute intervention was effective in reducing stress for these participants. However, Participants 3A and 7A

showed an increase in stress for Month 2. Participant 7A showed an increase in percentage of stress for Month 1. Yet, for both 3A and 7A, their Month 1 Pre to Month 3 Post percentages indicated a reduction in stress. It can be suggested that for participants 3A and 7A the intervention was effective for some months but not for others.

The percentage of stress measurements for Company B as a whole concluded that the MBSR breathing intervention was effective in reducing stress. Yet, to stay consistent with examining the meaning of the results, the researcher then looked at participants of Company B. In Company B, participant 3B, 5B, 6B, 8B, 9B, and 10B's data were collected for all 3 months. Participant 10B showed a percentage increase of stress for all months, including the Month 1 Pre to Month 3 Post comparison, thus, leading to the conclusion that the MBSR breathing intervention was ineffective for this participant. Two participants, 5B and 9B, showed increases in percentage of stress for Month 3; however, the previous months indicated a reduction in percentage of stress, thus showing mixed results of MBSR's breathing intervention effectiveness for these participants. However, three participants (3B, 6B, and 8B) showed reduction in percentages of stress for all months, including the Month 1 Pre to Month 3 Post comparison; thus, the MBSR breathing intervention was effective for these three participants.

The aforementioned information indicates that the GDV measurements and percentage changes can indicate if the intervention reduced stress or not; however, it does not indicate why the intervention was or was not effective. Nor do the quantitative results provide further information into what caused some participants to experience the MBSR breathing intervention as effective and experience a reduction in stress, and what caused other participants to experience the MBSR breathing intervention as an ineffective

intervention and experience an increase in stress. Therefore, these results need to be interpreted with caution as the research findings concur with literature review findings that stress affects people differently, stress interventions provide varying degrees of success, and stress is a highly personalized phenomenon.

Qualitative Discussion

Unlike the quantitative statistical data, the qualitative data provide an opportunity for the researcher to collect participants' experiences and perceptions of the intervention and their stress. The self-reported free writes gave each participant the opportunity to share his/her detailed story following the SMI. An important finding was each participant's first comment was about the SMI's impact on his/her stress level. Whether sharing that the stress decreased, increased or stayed the same, each participant's first comment directly reflected his/her current stress level. Another important finding was that the second series of comments were all about stressors. Shared stressors ranged from specific examples of stress from workload to personal life events to the wintery weather. For example, one participant shared, "The meditation did help a bit…I was a little stressed about the road conditions and I was thinking about going back home…the meditation helped me to forget about that for at least 10 minutes." Another participant wrote,

> Drastically reduced…I had a stressful morning. My car got stuck in the snow…which meant I did not have time to go to the coffee shop. Then I got to work and the sense of irritation and stress were weighing on me clouding my thoughts, words, and actions.

Others shared stressors were related to physical and emotional effects of stress. For example, one participant wrote,

> My stress level overall feels lower as the tension in my head appears to be missing, but in my chest it still remains…I was mostly thinking about the things that were left to do for the day which will be stressful.

Another participant wrote, "My stress level is decreased but I have a lot of responsibilities and people to connect with today…my doctor, co-workers." While another participant shared, "The meditation cut my stress level in half…refreshed is how I feel…it also helped me wake up a little more…I feel I could take over the world now!"

It is interesting to note that all participants wrote briefly about their stress level and then wrote in detail about their current stressors; this occurred consistently for each month. A possible explanation for this might be that stress means different things to different people. Therefore, everyone's experience and story is unique. Another possible explanation can be the desire to share the personal relationship of stress and stressor on the physical, emotional, and energetic levels (Korotkov et al., 2010; Lazarus, 1990; Stein, 2001). Since perceived stress is individualized, it affects people on all levels, including the physical, emotional, and energetic. Furthermore, another possibility is that the actions of coping through shared communication and processing the effects of stress are efforts made by individuals to tolerate, master, or reduce stress (Folkman & Lazarus, 1980).

These findings seem to be consistent with other research findings that stress is individualized, and that stress is a complex phenomenon consisting of primary physical, emotional, and energetic effects. In addition, the information mentioned in the free writes are consistent with findings from the literature review that groups stressors, coping

methods, and outcomes into common categories such as organization stressors, employee stressors, favorable coping, unfavorable coping, favorable aftereffects, and unfavorable aftereffects.

What is surprising is that the qualitative results provides several possible explanations as to what is occurring with employee stress both as a group and as individuals. The qualitative results do indicate that for some, the intervention was successful in reducing stress whereas for others the intervention was not. However, the qualitative data by itself does not confirm degrees of stress levels. For example, one participant mentioned that he/she experienced a reduction in heart rate following the intervention, and yet there is no way to confirm with the qualitative data a specific measurement of a decreased heart rate.

The reason for these discrepancies in the qualitative data is not clear, but it may have something to do with the need to mix both quantitative results with qualitative results. By doing so, the researcher can gain a holistic understanding of why the intervention was or was not effective, the effects of stress and the stress intervention, as well as how the qualitative and quantitative results compare and contrast.

Mixed Methods Discussion

The data collected in this study merely capture a moment in time. To address the research questions, the researcher relies on the both quantitative and qualitative information. The mixed methods design was chosen for two reasons. First, each of the individual methods, quantitative and qualitative, have beneficial qualities that the other does not. For example, qualitative analysis allows for emergent themes and meanings. In addition, the qualitative methodology allows for details about the experience of employee

stress and the participants' coping strategies as well as aftereffects of these strategies. In contrast, quantitative analysis allows for a statistical evaluation of the data. The second reason for choosing a mixed methods design is that the researcher can examine emergent themes from one method and see if they are corroborated by the other method.

The researcher conducted the mixed methods analysis in two processes: Level 1 and Level 2. Following Creswell's (2009) data transformation approach, the researcher quantified the qualitative data and assigned it numerical codes. The Level 1 coding of the participants' free writes related to the self-reported perceived stress levels. The Pearson correlation and information from Level 1 did indicate a correlation, as the p values were too high for all combined months, as well as the comparison between Months 1 and 3. In contrast, Month 2 indicated a weak correlation and was statistically significant. The discrepancy between the GDV stress measurements and the quantified self-reported perceived stress levels indicate that the Level 1 analysis is inconclusive. A possible explanation for this could be that comparing Level 1 coded perceived stress compared to GDV stress might not be the most appropriate variables to compare. As indicated earlier, participants shared in their self-reported free writes both perceived stress levels and other descriptors such favorable and unfavorable stressor aftereffects, including physical aftereffects, emotional aftereffects, and energetic aftereffects. For example, one participant shared, "I did relax a bit, but I heard too many distracting noises and my shoulders would tense up…the noises did not help me." Another participant wrote, "I do feel a little more relaxed but I had an interruption during the mediation." Still another participant shared, "I feel slightly less but I did not sleep much last night because my dog is sick." From these participant insights, perhaps then the more appropriate coded

variables to compare would the descriptors of the aftereffects with the GDV measurements. This led the researcher to recode the quantified qualitative data and rerun the Pearson's correlation in a Level 2 analysis.

The Level 2 analysis took into account the descriptive stressors such as favorable and unfavorable aftereffects: for example is "I feel less stressed but I have tension in my head." This sentence indicates a self-perceived lower stress level with an unfavorable physical aftereffect. Another real life example is a person saying he/she feels well but at the doctor's office the sphygmomanometer reads 160/80. Both of these examples indicate two opposing types of information about stress. The Pearson's correlation was rerun and indicated a positive correlation between GDV stress and the participant self-reported free writes. Month 2 indicated a very strong correlation. Furthermore, Whole Group all months, Month 1, Month 2, and Month 3 all indicated the correlation to be statistically significant. With this information, it can be concluded that a correlation exists between the GDV camera stress measurements and qualitative self-reports of stress.

Additional Interesting Findings and Discussion

Conducting a mixed methods study provided the opportunity to discover interesting or unexpected quantitative and qualitative findings. Additional qualitative findings emerged from the participant follow-up interviews as well as the manager interviews. Other quantitative findings emerged from the GDV data regarding the human energy biofield.

Qualitative Follow-up Interviews

The qualitative follow-up interviews provided an avenue to explore possible aftereffects as well as overall experiences participating in the study. The follow-up

interview findings provided valuable insight. All but one participant indicated experiencing stress at work. As one participant stated, “When I’m stressed, my mind won’t quiet down…it helps me get a lot done, but then when I get home, I’ll have a difficult time sleeping.” Other participants shared that workplace stress leads to co-workers being irritable, confrontational, and sometimes withdrawn. One participant shared, “Our industry stresses us out to get things done on time and it equals a domino effect…people getting behind can become frantic and less grounded…then you don’t make clear decisions.” Participants shared various coping techniques that they use at work, such as taking frequent breaks, talking with co-workers, talking with managers, going outside for lunch, exercise, and walking away from stressful encounters. In addition, an interesting finding is that not one participant mentioned connecting with human resources (HR) as a way to cope with workplace stress. Participants either self-generated means to cope with stress or relied on others such as their manager or co-workers to help offset stress. Furthermore, none of the managers mentioned using HR as a resource to help employees with stress. These findings are surprising given that the HR department is part of an organizational support system for the company’s employees. Furthermore, no managers indicated that they used any company sponsored employee assistance programs to help employees with their stress.

A second unexpected and favorable outcome was that participants learned new skills to use and offset stress. As one participant shared, “I can hear your voice saying ‘breathe’ and then I focus on my breathing…thank you for helping me. I feel like I have a better grasp of my day. I’m more excited because I am more prepared.” Yet another participant added, “After doing the program, I downloaded apps on my telephone to open

my mind to something and help me in my stressful job." Other participants concurred, sharing that they developed new skills and a new tool to use when they feel stressed or panicked.

A third unexpected finding was that some participants thought the program brought their team together and strengthened their relationships. One participant shared, "It (the program) brought a different skill set into the setting…one that we enjoyed as a team and we were brought closer together." Other unexpected findings were how the program benefited the organization. One participant wrote, "I hope that the company takes the time to listen to your study and looks at asking how it helped reduce employee stress." Another added, "Thinking long-term, we will definitely show positive results…we should have a companywide session…that would be super awesome!"

A fourth unexpected finding was the expressed gratitude and appreciation for the program. Seven people shared personal thoughts of gratitude and appreciation for participating. One participant shared, "Thank you for letting me do this." Another participant added, "Thank you for bringing this into my life." Another participant shared, "The program help me and plays a big role in life here (at work) and out." Other comments included, "I've been telling everyone that something like this exists and they should try it!" as well as "the program is short, simple, not complicated and easy to follow."

Overall, participants shared personal benefits in participating as well as benefits to their teams and the organization. In addition, participant experiences were overall favorable; they reported that they would recommend others and the organization to "just do it" as a means to reduce employee stress. These unexpected findings within the

qualitative interviews enrich the study by lending a comprehensive view of the participants' experiences as well as benefits from participating. Based on these personal stories, it appears that unexpected outcomes resulted from participating in the research study; the participants gained lifelong skills to integrate into their personal and work lives to reduce stress.

Manager Interviews

The qualitative manager interviews provided an avenue to explore insights into employee stress from the managers' perceptions. The manager interviews and findings provided valuable insights that complemented the participants' qualitative findings. First, all managers acknowledged witnessing stressed employees at work. The managers shared unfavorable behaviors from stress ranging from conflicts between employees to employees being withdrawn. One manager commented that stressed employees can sometimes result in "snippy behaviors…people being short with one another." A second manager shared, "employees can react to people who cause the stress and have a verbal argument." Additionally, stressed employees can show covert behaviors such as "withdrawing into their own shell" and have a "lower the interaction with the team." One manager stated, the "challenge [with stress] is some people are laid back to stress and to others that [stress] is extremely stressful."

Secondly, all managers shared that pressures to work contribute to a stressful work environment. One manager pointed out that their team tries to prepare for stress through time management approaches, but stress cannot be avoided. This manager added, "You can feel the tension and that tension is felt throughout the day." So, how do managers help reduce employee stress? An unexpected finding was that all managers

strongly communicated their personal responsibility to helping their team and individual employees reduce stress. As one manager put it,

> As a manager, it's my responsibility to understand what the team and my employees are going through...to interpret how my team and employees are being affected by stress and to provide them with solutions, a place to vent, or even take a day off.

Another manager echoed this sentiment, saying, "We have a sense of teamwork and we all have each other's backs…we support each other."

Third, while managers offered support and ideas to constructively mitigate stress, managers observed adverse coping behaviors. Managers shared that most of the observed coping actions leaned toward unfavorable coping behaviors. These included complaining, whining, eating poorly, and withdrawn or confrontational behavior. One manager shared, "Complaining poisons everything and increases everyone's stress…normally, coping is either eating poorly, happy hour, or whining."

The managers shared a few reasons for participating in this research. One reason was to understand the effects of stress. A second reason was to participate in a mini-stress intervention. As one manager put it, "To [see] how stress changes and evaluate how work is affected as well as the physical and psychological wellbeing of the employees." All managers shared that they had a vested interest in helping to recognize stress and help employees' physical, emotional, and energetic wellbeing. A manager shared, "To gauge stress…to understand how stress effects them and how physically, mentally, and energetically they feel after the intervention." Another manager added, "Wellbeing is a state of peacefulness. When I am at peace with myself, there is no worry or anxiousness;

I am at peace and I am healthy." As expected, another reason for participating was to also help employees become more productive. However, this reason was mentioned after the shared interest in employees' wellbeing.

Lastly, all managers shared that participant feedback was positive. A manager shared, "One employee has talked non-stop about the program." Another manager added,

> A lot of people don't admit they are stressed, understand stress, recognize stress and how to dial it down…but now people have a new skill to recognize the situation and the state of stress and stop it before it starts.

Other comments included the level of being surprised that a 10-minute mediation was so effective, that people were happy after participating, and many were open to continuing using the technique. An unexpected finding was that the program taught participants and managers about the level of commitment to practice, defining for one's self the meaning of mindfulness, and making the choice to be aware and intentional throughout the day. As one manager shared, "It taught them how to recognize their stressors, to be intentional about breathing, to aware and practice…to choose to do it…and doing it will increase morale and decrease stress levels." Another manager commented, "This program taught everyone, including me, a great lesson about commitment, to be mindful…and what that means…and to make a choice to practice [the SMI]."

The overall manager interviews conveyed information that further enriched the research findings. Examples include: Each manager's personal commitment to his/her employee's and team's wellbeing, awareness of unfavorable coping actions and behaviors, providing constructive coping means, using the research program to gauge the

current status of employee stress, and to continue using the breathing and mindful techniques to reduce stress and increase employee wellbeing and productivity.

Human Energy Biofield

This research study provided an opportunity to examine the human biofield, as measured by the GDV camera. The researcher was curious to look at the MBSR breathing intervention and examine how it affected the human energy biofield. The GDV camera captures two human biofield images: one with a filter and a second without a filter. GDV camera images with a filter remove pixel noise from the digital images. Noise pixels originate from the engineering features of the camera operation and are common in digital imaging (Korotkov, 2002). Removing the noise pixels results in a clearer photographic image. For example, optical imaging of the optic nerve used by optometric practitioners to view images use filters to remove digital pixel noise of optic nerve captured images. The researcher chose to use the human biofield data with the filter to examine the possible effects of the MBSR breathing intervention on the biofield by month for Whole Group, Company A, and Company B.

The researcher conducted a paired samples *t* test using SPSS by Whole Group and for each company by month as well as to compare Month 1 Pre with Month 3 Post intervention. The statistical calculations showed unexpected information. For the Whole Group, the human energy biofield increased for Month 1, Month 2, and Month 1 Pre with Month 3 Post intervention; however, the *p* values for these calculations were too high (Table 18). Therefore, the data are inconclusive to determine if the MBSR breathing intervention was effective or not. In contrast, the human energy biofield for Month 3 indicated an increase in human energy biofield and a *p* value that is statistically

significant. Therefore, in Month 3 the MBSR breathing intervention for the Whole Group was effective.

Table 18

Paired Samples Test Whole Group Energy Field

Pair	Mean	Sig. (2-tailed)
Month 1 Post-Intervention Energy Field Area with Filter - Month 1 Pre-Intervention Energy Field Area with Filter	25.357	.947
Month 2 Post-Intervention Energy Field Area with Filter - Month 2 Pre-Intervention Energy Field Area with Filter	334.071	.129
Month 3 Post-Intervention Energy Field Area with Filter - Month 3 Pre-Intervention Energy Field Area with Filter	1122.333	.000
Month 3 Post-Intervention Energy Field Area with Filter - Month 1 Pre-Intervention Energy Field Area with Filter	126.727	.829

Note. *p <.05, **p<.10

For Company A, Table 19 shows in Month 1 and Month 3 the human energy biofield increased and the p values are statistically significant. From this information, the researcher can conclude that the MBSR breathing intervention was significant. However, in Month 2 and Month 1 Pre with Month 3 Post, the human energy biofield decreases and the p values are statistically insignificant; therefore, these results are inconclusive for these months as to whether or not the MBSR breathing intervention was effective.

Table 19

Paired Samples Test Company A Energy Field

Pair	Mean	Sig. (2-tailed)
Month 1 Post-Intervention Energy Field Area with Filter - Month 1 Pre-Intervention Energy Field Area with Filter	1063.833	.003
Month 2 Post-Intervention Energy Field Area with Filter - Month 2 Pre-Intervention Energy Field Area with Filter	-11.800	.956
Month 3 Post-Intervention Energy Field Area with Filter - Month 3 Pre-Intervention Energy Field Area with Filter	999.571	.010**
Month 3 Post-Intervention Energy Field Area with Filter - Month 1 Pre-Intervention Energy Field Area with Filter	-82.200	.913

Note. *p <.05, **p<.10

For Company B, Month 1 showed a decrease in the human energy biofield with an insignificant *p* value (Table 20). The comparison between Month 1 Pre with Month 3 Post indicated an increase in the human energy biofield, but the *p* value was too high. Therefore, the data are inconclusive for these data sets to determine effectiveness of the MBSR breathing intervention. However, Month 2 and Month 3 both showed increases in the human energy biofield as well as a strong statistical significance, yielding a strong indicator that the MBSR breathing intervention was effective for Month 2. Additionally, a conclusion can be drawn that the MBSR breathing intervention was effective for Month 3.

Table 20

Paired Samples Test Company B Energy Field

Pair	Mean	Sig. (2-tailed)
Month 1 Post-Intervention Energy Field Area with Filter - Month 1 Pre-Intervention Energy Field Area with Filter	-753.500	.154
Month 2 Post-Intervention Energy Field Area with Filter - Month 2 Pre-Intervention Energy Field Area with Filter	526.222	.106**
Month 3 Post-Intervention Energy Field Area with Filter - Month 3 Pre-Intervention Energy Field Area with Filter	1229.750	.011
Month 3 Post-Intervention Energy Field Area with Filter - Month 1 Pre-Intervention Energy Field Area with Filter	300.833	.758

Note. $p < .05$, $^{**}p < .10$

While the human energy biofield is a progressive and exploratory concept, the information from this study indicated that in some months the MBSR breathing intervention was strongly effective and affected the human energy biofield. Yet, for other months, some *p* values were too high and this resulted in inconclusive data regarding the effectiveness of the MBSR breathing intervention. These additional interesting findings indicate the need for further research in the human energy biofield, blending principles of Quantum Physics with MBSR and employee stress.

Conclusion

In summary, participants in this research study did experience effects as a result of the MBSR breathing intervention. Some of the effects were inconclusive, whereas some effects were statistically significant. This supports the position that stress is highly personalized, as is the effectiveness of an SMI (Edwards & Cooper, 19998; Gruen, Folkman, & Lazarus, 1998; Harris, 1970; Johnson & Johnson, 2010; LeFevre et al., 2006; Nelson & Simmons, 2003; Stein, 2001; Thoits, 1995). It is also evident that there was a significant personal impact of the intervention. Participants learned valuable skills, such as: awareness of stress, breathing techniques, choosing to practice the skills, improved teamwork, and appreciation for favorable and unfavorable aftereffects of stress and the SMI. Most participants were determined and excited to continue to practice and use the breathing stress technique at work and in their personal lives. These findings will benefit the individual, workgroups, and organizations by recognizing that stress interventions are individualized and that management support as well as employee commitment to practice will reduce employee stress.

Furthermore, the GDV camera proved to be a convenient and new tool to measure employee stress. The camera is portable, easy to use, and non-invasive. Overall, the participants found it easy to place their fingers on the glass plate and found the camera interesting. They expressed interest in how it works and were interested in seeing their GDV stress measurements. Also, the GDV camera and software modules allowed the researcher to capture several participants' images in succession, review many processed data images, and organize the images in electronic folders.

In addition, both methods of data collection and analysis were necessary to develop the most thorough answers to the research questions. It is evident that if the researcher solely examined the quantitative data alone, possible false-positive or false-negative indicators could have been collected. To illustrate, by looking at raw data such as a laboratory report, a practitioner can make a prognosis and recommendation. However, if the practitioner looks at the data report and asks the patient to share how he/she is feeling, the practitioner now has additional information on which to make a prognosis and recommendation. This recommendation may or may not be the same from when reviewing just the laboratory report. In the case of the research, a mixed methods design enabled the researcher to conduct a thorough analysis to address both research questions. This supports the position the importance of blending methods, which strengthens the study and provides for deeper and richer research (Creswell, 2009; Creswell, Fetters & Ivankova, 2004; Creswell & Plano Clark, 2011; Ross & Morrison, 2001; Weathington, Cunningham & Pittenger, 2010).

Limitations and Implications

This exploratory study examined several new concepts. There were several limiting factors involved with this research study. One limitation was the small non-random participant sample. Because the workgroup size was small, the information is not representative of the overall population. Conducting the study was difficult, as several unexpected and uncontrollable events, such as a winter snowstorm occurred during the data gathering process.

Another limitation was dealing with the participants' busy schedules. Many times participants were late in arriving at the scheduled time or not available to participate

during a particular month due to travel, other work obligations, relocation, or illness. A few participants agreed to participate and signed the consent form but never attended a session.

Interruptions during the sessions reflected another limitation. At one session, outside noises in the hallways were disruptive and participants felt an increase in stress. Other interruptions included telephones ringing or buzzing, packages being delivered, people talking and making jokes as well as making comments about work stress such as recent layoffs or resigning, and multitasking on work related items during the session and not being fully present in participating in the study.

Manager engagement was another limitation. Although two companies participated in this study, the researcher observed different levels of management engagement. Within one company, the manger traveled for a majority of the research timeline and participants expressed frustration with the schedule set up. The researcher sent to the mangers a reminder 1 week prior and then a second reminder the day before being onsite. The managers then coordinated space availability and communicated with their team. In the company with the manager who traveled, this group showed the least number of participants. However, the other participating company always had a management representative present reminding everyone of the time and communicated to the researcher about any unexpected challenges and absences.

Time was another limitation. The researcher was scheduled to conduct the research sessions onsite during an hour timeframe. An additional half hour prior was available for the researcher to set up for the study. The amount of time proved challenging as the researcher sometimes had to wait for the conference room to become

available from a previous meeting. On other occasions, non-participating employees would be eating lunch in the scheduled conference room and the researcher then had to explain the room was occupied and then had to clean off the conference tables that were dirty from food. These situations lowered the researcher's total time to prepare to conduct the study.

Also, the study was limited by the nature of the qualitative self-reported free writes and follow-up interviews. The post intervention free write only contained one question and the follow-up interviews contained a few questions. Given the limited amount of time, these questions had to be practical, thereby limiting in the depth of possible data.

Additionally, the GDV camera had limitations of its own. The GDV camera is a non-invasive and portable stress measurement tool; however, there are several major drawbacks to using this tool. First, the technical support and customer service is based at KTI in Russia or a KTI GDV resale dealer in the United States. The researcher contacted KTI and its U.S. representative with a technical question, which was successfully answered. It was obvious to the researcher that the contact in Russia spoke English but did not understand the researcher's question, although the researcher restated the question several times. The response time and communication efforts for one question spanned over 3 months without a resolution.

Second, several inconsistent terms are used to describe the GDV's technical capabilities and GDV technique. For example, terms used to describe the GDV technique are biological emission and optical grams (BEO grams), GDV grams, electrophotonic imaging, biophotonic imaging, gas discharge visualization, GDV Kirlian imaging, and

bioelectrography. The lack of consistency provides confusion among practitioners, users of GDV, as well as in the research and academic communities. To date, international reseller websites, publications, and other communications such as marketing brochures continue to use inconsistent terms regarding the GDV technique.

Third, another limitation with GDV is the capability of the software modules to interface with each other. The software does not handle multiple subjects in an intuitive way; if the operator does not close out the program, then there is a risk of overriding someone else's images. The researcher had to close out of software modules due to not wanting to risk losing captured images as the software locked up when capturing subsequent images. Of course, with all modern technology, each year software updates are available; however, it is not clear whether these technical software problems will be resolved.

Fourth, the design of the GDV camera's outer hard case restricts the placement of a thumb and does not accommodate for the finger webbing between thumb and finger, making it awkward to capture thumb images and in some cases necessary to recapture images, which added time to the overall capturing of images.

Fifth, the time to warm up and calibrate the GDV camera took several minutes; 5 minutes for the camera to warm up and then 10-15 minutes to calibrate the camera using the calibration object. The researcher had expected a fairly quick and automated calibration process rather than the manual and time intensive methods.

Lastly, the GDV camera and software modules are expensive and represent a substantial investment. Expenses and commitment of owning a GDV camera range from initial purchase to software updates to user training. While user training occurs every year

in Russia as well as in the United States, additional several expenses are incurred during travel required for training. For example, yearly travel to Russia is not practical and involves international airfare, securing necessary travel papers such as a visa, hotel, transportation, and classroom training fees. While training is offered in the United States, these weeklong informal sessions are currently only offered two times per year.

Implications

The overall research highlights that employees experience stress at work on a regular basis. The costs associated with employee stress are significant to organizations and present a global challenge. The non-financial effects associated with stress were described by many of the research participants as unfavorable to their productivity, collaboration, creativity, and physical, emotional, and energetic wellbeing. Therefore, finding new and effective tools to measure and monitor stress as well as effective interventions to reduce and prevent workplace stress is critical.

Implications for individuals. In this research study, participants learned how to recognize the individualized and various ways of responding to stress. Whether responses to stress were favorable or harmful, participants learned a new skill to respond to their perceived stress: the MBSR breathing technique. This technique is simple, discrete, portable, quick, and effective. Furthermore, the breathing technique is applicable at work as well as in personal life.

Implications for organizations. Organizations and business leaders can use SMIs and mindfulness as an integral part of strategic initiatives. For individuals, employees, and leaders within an organization, the act of being mindful means to be aware in the present moment, intentional in thought, and purposeful in action. When

integrated into strategy planning and strategic initiatives, these principles could produce beneficial outcomes for the overall organization. Examples include: competitive advantages, employee engagement, decreased attrition, increased productivity, greater wellbeing, leader development, workgroup camaraderie and cohesion, healthy organization culture and climate, organization longevity, and organization and global society philanthropy.

Implications for OD. The outcomes of this research study have several implications for OD. First, for the field of OD and its OD scholar practitioners, this research provides an avenue by which to be open-minded and explore new concepts rooted in quantum physics and mindfulness. Secondly, this research provides to OD as a field an opportunity to develop new theories, skills, and tools to pioneer the next generation of OD scholar-practitioners. These opportunities would not be as restrictive as past Newtonian concepts such as allopathic solutions and social neuroscience, or stymied by perpetuated traditional ritualistic debates, or historical reflexive skepticism that takes precedent over exploration and inquiry. Instead, these opportunities would encompass holism of individuals, groups, and organizations, developing new theories and adding to the body of knowledge as well as ensuring the longevity of OD. This research provides evidence that concurs with prior research (Conbere & Heorhiadi, 2008; Gerber, 2001; Katchmer, 1993; Korotkov et al., 2010; Rubik, 2004; Schure et al., 2008; Schwartz, 2007; Tiller, 2004) supporting quantum concepts illustrating that individuals are more than a brain and more than a body; individuals are surrounded by a measurable human energy biofield that impacts individuals on emotional and physical levels as well as the people around them.

Future Research

Further research on the effects of the MBSR intervention and employee stress using the quantitative GDV camera stress measurements needs to be conducted. The researcher has several suggestions for future research.

Repeat research. Further research is needed with an increased population sample size. The researcher identified two ways of doing this. One approach is to repeat the research within one company and include several workgroups within a specific department. The increased sample size should affect the SPSS calculation of the paired *t* test and the statistical significance of the data to determine the relation to the overall population. A second way is to repeat the research with several companies and several workgroups within those companies. The second approach has several benefits, for example: a broader diversity of the sample population by industry, the possibility to make references and representation about the overall population, improved statistical significance to the SPSS paired *t* test calculations, and stronger key themes.

Environment. Future research is needed to explore options regarding the room set up. For example, one study may include a quite room where environmental factors such as noise, lighting, comfort, are controlled. Another study would include not controlling environmental factors and could include specific non-environmental factors such as bright light, noise disturbances, and other distractions. An additional study could include begin with a controlled environment that gradually transitions into a non-controlled environment. This type of study supports Kabat-Zinn's (1990) position that through continued long-term practice, individuals can practice and experience positive effects of the MBSR breathing meditation anywhere and anytime. Future research studies

regarding environmental factors could be analyzed to determine the relationship the environment has regarding the effectiveness with the MBSR breathing intervention, stress reduction, and effective stress intervention practice.

Intervention time series. Future research might change the length of time within the time series to gain richer data. For example, one time series may include an MBSR intervention one time per week for 8 weeks. A second time series may include an MBSR intervention one time per week for an entire year, measuring the longevity of the effects of the MBSR intervention including attrition, productivity, employee engagement, satisfaction, wellness, work-life balance, and organization culture.

Tenure. Future research could assess stress coping behaviors and actions of employees based on their tenure. Tenure could be divided into categories such as new employees to the company and senior employees to the company, tenure within industry, tenure of education, background, and experience, as well as tenure with familiarity and practice of the MBSR breathing intervention including other stress interventions.

Chronic stressors. Future research studies could begin with identifying short-term stressors and conduct a time series study assessing the short-term stressor to analyze if the short-term stressor transformed into a chronic stressor.

Individuals. Future research could include learning more about perceived stress, individual's perceptions of stress, commitment to practice stress reduction techniques, and impact of perceived stress at work and personal life.

Leadership. Future research is needed to explore levels of leadership engagement, support, and participation regarding stress interventions and reducing employee stress. For example, one study may include leaders to participate in the MBSR

breathing intervention. Another study would include not participating in an MBSR breathing intervention but would rather provide defined and measurable levels of support to employees participating in the MBSR intervention. An additional study could include both leaders and employees collectively participating in the MBSR breathing intervention.

GDV uses. Future research studies could use of GDV stress measurements to evaluate the effectiveness of several SMIs by individual. Based on the findings and effectiveness, the organization can identify the most effective intervention types and create a specialized organizational employee assistance program to reduce stress. In addition, research may involve establishing shared best practices by industry and across industries. Another study could include repeating the original study with additional GDV cameras and research assistants. The additional GDV cameras would shorten the time between intervention and post GDV image. This could also lessen the risk of possible distractions that could impact the effects of the stress intervention as well as the post GDV image.

Mind, body, and bioenergy. Future research might also consider repeating the research and adding a few requirements: first, that participants use the MBSR breathing technique in their work and personal lives. Secondly, participants would be required to keep a journal of experiences. Thirdly, the human energy biofield would be an explored component of the repeated research study. All of these components would evaluate the effectiveness of the MBSR by taking into account the holism of an individual as well as his/her work and personal life.

Conclusion

This research study explored the correlation between a new quantitative stress measurement, GDV stress, and compared it with a qualitative self-reported perceived stress free write. This study explored the effectiveness of a 10-minute MBSR stress intervention using a mixed methods convergent design. The purpose of a convergent design is to collect different but complementary data on the same topic using both quantitative and qualitative methods. A non-randomized quasi-experimental, pre-test and post-test, two group, short time series design was used to collect quantitative data, which included stress levels measured by a 5-minute free write questionnaire and GDV captures (see Table 1). These variables were measured before and after the intervention for 3 consecutive months within 4-week intervals and at a follow-up with all participants and managers 1 week after program completion. The qualitative methods used were a semistructured post intervention 5-minute free write and follow-up interviews.

Results from the study included several findings. One finding included that 93% of the participants in this study experienced workplace stress and 100% of interviewed managers witnessed stress among their employees. Secondly, findings related to stressors were grouped into categories and themes that concurred with the literature review, including: organization, employee, and personal. Specific organization stressors included unbalanced workload, unsupportive environment, and relationship conflicts. Employee-themed stressors were difficulty concentrating and performing job duties as well as physical and emotional ailments. Personal themed stressors identified in the study were work-life balance and uncontrollable events such as the weather.

Coping mechanisms used to deal with stress were either favorable or unfavorable actions. Favorable actions included exercise, taking frequent breaks, talking to co-workers, or going outside for lunch. Unfavorable actions were going to happy hour, poor eating habits, and confrontational and withdrawn behaviors. However, this research revealed that participants benefited from participating in the study as they learned a new skill to use when stressed. Some participants shared that they began the MBSR breathing technique at work and in their personal lives, and shared it with friends and encouraged them to use it to reduce stress.

The statistical data from the research study showed several findings. First, the paired *t* test for Whole Group in Month 1 and Month 2 did not show a statistical significance. However, in Month 3 the data showed a statistically significant reduction in stress and a somewhat significant reduction in stress for Month 1 Pre with Month 3 Post. For Company A, Month 1 and Month 2 showed an increase in stress; however, a decrease in stress for Month 3 as well as Month 1 Pre to Month 3 Post. Company B showed a consistent stress reduction for Month 1, Month 2, Month 3, and for the Month 1 Pre to Month 3 Post comparison. Therefore, using the quantitative data alone to answer the research question 2 results in a yes-no answer; for some the MBSR did reduce stress and for others it did not. However, given the high *p* values of the *t* test in some months, the quantitative data are inconclusive regarding whether or not the MBSR was effective.

Second, the quantitative and quantified qualitative data were used to answer the first research question. Two levels of analyses were performed. Level 1 analysis for the Whole Group with all months as well as for Month 1 and Month 3 the data showed no correlation and was not statistically significant. However, for Whole Group Month 2, the

data indicated a weak correlation that was statistically significant. The Level 2 analysis for the Whole Group with all months and Month 1 showed a strong, statistically significant correlation. Month 2 indicated a very strong correlation that was statistically significant. Furthermore, Month 3 showed a statistically significant correlation. From the quantitative and quantified qualitative data, the researcher can conclude with certainty that there is a correlation between the GDV camera stress measurements and the qualitative self-reported stress measurements.

Managers interviewed in this study indicated that employees benefited from participating. Managers shared their responsibility and commitment to being aware of employee stress and acknowledged the importance of addressing stress for the wellbeing of employees as well as for employee creativity and productivity. Reasons given for participating in the study included a mini-intervention, to learn new skills, and to see how the GDV measures stress and the effectiveness of the MBSR technique.

As mentioned earlier in the literature review, a challenge facing OD and business leaders are old theories wrapped in new packaging, which offer little resolution to organizational problems (Brookfield, 2005; Morgan, 2006; Weisbord, 2004). Therefore, it is essential that future research be grounded in quantum concepts and develop new theories to better understand individualized perceived stress, as well as to truly comprehend how to address the global issues resulting from stress.

This research revealed several unexpected findings including the MBSR effects on the human energy biofield and memorable quotes. As one manager stated,

> This takes practice and commitment as well as the choice to be mindful. It is so valuable; so incredibly valuable…and to use it for productivity, efficiency,

> creativity, as well as teamwork and bringing people together so that we are on the same page because personal stuff and stress stuff effects each person at work…we are now able to use this tool if we ever get stressed or feel panic…this is especially great for everyone as stress distorts our understanding of how to be calm…when we reduce stress we can see more clearly and we are creative…I think it was really effective and really good.

A participant shared this overall experience:

> Thank you for helping me…I never did anything like this before and I take medication to deal with stress…breathing calms my anxiety down and calms my nerves…it clears my brain…this is a good way to reduce stress without taking medication. I now take time every morning for myself and ease into the day. I feel like I have a better grasp of my day and I'm more excited because I'm more prepared. If I feel anxious, I just breathe. This program has helped me and plays a big role in my life here and out [of work].

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Appendix A

Standard Manager Pre-Follow-up Research Study Survey and Disclosure

Introduction:

As Manager, you will be asked to answer five questions pertaining to your experience and observations with employee stress. You should answer the questions as honestly and accurately as possible. All information pertaining to this survey will be kept confidential and you will be given a unique identifier to track your subsequent surveys, otherwise, your true identity will not be disclosed in any manner in the research. I will be asking general demographic questions for coding purposes only.

There are some minimal risks to participating in this research, for example, persons outside of the study may infer that your organization participated in this research. However, I will make every effort possible to protect the confidentially of the information by keeping the collected data in a locked file or password protected laptop, de-identifying any personal and/or organization information as well as destroying the written and electronic data at the conclusion of this study.

I will not be recording the survey interview; however, I will be taking typed and/or written notes to capture your comments and insights.

You have signed the provided Consent Form stating that you understand the nature of this research study and that all of your questions have been answered. Also, you have received a copy of the Consent Form for your records.

Your participation in this study is completely voluntary. You can choose to withdraw from participating in the study at any time. Do you have any additional questions about this study?

Participant Possible Questions:

What is this research study about?

Can you explain what you are being asked to do in this study?

Please explain the risks involved in the study.

How will your information be kept confidential?

What do you understand about volunteering for this research study?

What are your concerns about participating in the research study?

Manager Pre-Follow-up Research Interview Questions

1. For purposes of this research study, employee stress is defined as a negative emotional, physical, and energy experience accompanied by predictable behavioral, physiological and energetic changes that are directed either toward modifying the stressful event or reacting, accommodating, or exhausting to its effects. Using this definition, have you ever observed employee stress in this work team? If yes, please describe your observations.
2. How do employees cope with stress at work?

3. Why did you decide to participate in the research program?

4. What did you expect to learn from participating in the research program? (Pre Question)

5. Please explain your work team's experience participating in this research program. (Follow up Question)

6. What additional information would you like to share with me?

Appendix B

Sample Recruitment Email

Dear Colleague,

My name is Debra Lindh and I am a doctoral candidate in organization development at the University of St. Thomas in Minneapolis, Minnesota. I am also a business consultant and certified in energetic practice and gas discharge visualization (GDV) camera technology.

I am conducting dissertation research about the effects of a stress management breathing technique intervention for addressing employee stress and documenting using a GDV camera. The study is looking at the effects of employee stress using a stress management intervention within a naturally occurring business; primarily a work team of 15 or less employees engaged in a high project or service season. Your organization was selected as a possible participant in this study through the researcher's various professional networking sources.

Background Information:

Employee stress is a major source of concern for organizations. It is especially challenging to acknowledge the employee stress within the business environment where the naturally occurring stress becomes part of the business norms. Addressing this affect within an organizational environment presents various challenges to business leaders, human resource practitioners, and organization development consultants.

Due to the contemporary nature of this topic, little to no research using contemporary and innovative assessments such as GDV camera technology has been conducted. This study will provide a catalyst for awareness and new measurement assessment within business practices and as a model for addressing employee stress.

Therefore, the purpose of this study is to understand affects of a stress management technique intervention of employees and workgroups within an actual workplace environment experiencing naturally occurring stress and combine traditional survey measurements with introducing a new measurement GDV.

Participant Criteria:

The following criteria for participating in this study are as follows:

a. The organization is a for-profit business;
b. The organization is either a entrepreneurial company or a mature business;
c. The work team has a maximum of 15 employees;
d. The work team has an active manager or director;

e. The business environment is experiencing a naturally occurring stress period (e.g. product development, product launch, service industry during peak seasons, year-end buying cycle).
f. The individual participant is part of a work team within the organization.

Participation in this study is completely voluntary.

A maximum combined total of 30 individuals that meet the criteria will be invited to participate in this study.

Compensation:

Individuals will receive no compensation for participating in this study.

Confidentiality:

The records of this study will be kept confidential. If your organization agrees to participate, more detailed information will be provided pertaining to the confidentiality of the information and the protection of the individual participants.

Procedures:

If you agree to participate in this study, I will ask you to do the following:

1. Acknowledge your interest in participating in this study, sign, and return the informed consent form.
2. Choose a location for the study to be conducted (i.e. conference room).
3. Participate in a structured stress management intervention sessions with the researcher; with each session lasting approximately 1 hour for 3 consecutive months (See Attached Document for Schedule).
4. Answer a post intervention survey pertaining to your experience with the intervention.
5. Answer a post research questions pertaining to your experience after the intervention.
6. Provide demographic information, including age, gender, educational background, and length of time employed with current organization
7. Allow the researcher to complete hand written notes of the intervention and interviews. Allow the researcher to summarize the notes and review the documentation to ensure accuracy, if needed.

Request:

If you are interested in participating in this study and sharing your experiences, please contact me directly to learn more about the research, discuss the parameters of participation and schedule an interview time. If you may know of someone who may be

interested in participating in this study, please share this information and have them contact me directly.

Due to the confidential nature of this research, I will not be able to disclose to you the other businesses participating in this study. However, due to the contemporary and timely nature of this topic, I believe the research will have a positive impact on our industry for organizations, employees, and organization development.

Contacts and Questions

If you have questions related to this study, feel comfortable to contact me at lind3796@stthomas.edu, debralindh@gmail.com or my cellular telephone at 763-360-7073.

Thank you in advance for considering to participate in this research.

With kind regards,

Debra Lindh, M.A.
Doctoral Candidate

Appendix C

Consent Form

Institutional Review Board
University of St. Thomas

CONSENT FORM

Please read this form and ask any questions you may have before agreeing to participate in the study.
Please keep a copy of this form for your records.

Project Name		IRB Tracking Number	

General Information Statement about the study:
You are invited to participate in this research. You were selected as a possible participant for this study because:

Study is being conducted by:	
Research Advisor (if applicable):	
Department Affiliation:	

Background Information The purpose of the study is:
Procedures If you agree to be in the study, you will be asked to do the following: *State specifically what the subjects will be doing, including if they will be performing any tasks. Include any information about assignment to study groups, length of time for participation, frequency of procedures, audio taping, etc.*
Risks and Benefits of being in the study
The risks involved for participating in the study are:
The direct benefits you will receive from participating in the study are:
Compensation Details of compensation (if and when disbursement will occur and conditions of compensation) include: *Note:* In the event that this research activity results in an injury, treatment will be available, including first aid, emergency treatment and follow-up care as needed. Payment for any such treatment must be provided by you or your third party payer if any (such as health insurance, Medicare, etc.).

Confidentiality
The records of this study will be kept confidential. In any sort of report published, information will not be provided that will make it possible to identify you in any way. The types of records, who will have access to records and when they will be destroyed as a result of this study include:

Voluntary Nature of the Study
Your participation in this study is entirely voluntary. Your decision whether or not to participate will not affect your current or future relations with any cooperating agencies or institutions or the University of St. Thomas. If you decide to participate, you are free to withdraw at any time up to and until the date\time specified in the study.
You are also free to skip any questions that may be asked unless there is an exception(s) to this rule listed below with its rationale for the exception(s).

Should you decide to withdraw, data collected about you	will be used in the study

Contacts and Questions	
You may contact any of the resources listed below with questions or concerns about the study.	
Researcher name	
Researcher email	
Researcher phone	
Research Advisor name	
Research Advisor email	
Research Advisor phone	
UST IRB Office	651.962.5341

Statement of Consent			
I have read the above information. My questions have been answered to my satisfaction and I am at least 18 years old. I consent to participate in the study. By checking the electronic signature box, I am stating that I understand what is being asked of me and I give my full consent to participate in the study.			
Signature of Study Participant ☐ *Electronic signature*		Date	
Print Name of Study Participant			
Signature of Parent or Guardian (if applicable) ☐ *Electronic Signature*		Date	
Print Name of Parent or Guardian (if applicable)			
Signature of Researcher ☐ *Electronic signature**		Date	
Print Name of Researcher			

*Electronic signatures certify that:

The signatory agrees that he or she is aware of the polities on research involving participants of the University of St. Thomas and will safeguard the rights, dignity and privacy of all participants.

- The information provided in this form is true and accurate.
- The principal investigator will seek and obtain prior approval from the UST IRB office for any substantive modification in the proposal, including but not limited to changes in cooperating investigators/agencies as well as changes in procedures.
- Unexpected or otherwise significant adverse events in the course of this study which may affect the risks and benefits to participation will be reported in writing to the UST IRB office and to the subjects.
- The research will not be initiated and subjects cannot be recruited until final approval is granted.

Appendix D

Standard Participant Follow-Up Survey and Disclosure

Introduction:

You will be asked to answer eight follow-up questions pertaining to your overall experience with the stress management intervention and research study. You should answer the questions as honestly and accurately as possible. All information pertaining to this survey will be kept confidential and you will be given a unique identifier to track your subsequent surveys, otherwise, your true identity will not be disclosed in any manner in the research. I will be asking general demographic questions for coding purposes only.

There are some minimal risks to participating in this research, for example, persons outside of the study may infer that your organization participated in this research. However, I will make every effort possible to protect the confidentially of the information by keeping the collected data in a locked file or password protected laptop, de-identifying any personal and/or organization information as well as destroying the written and electronic data at the conclusion of this study.

I will not be recording the survey interview; however, I will be taking typed and/or written notes to capture your comments and insights.

You have signed the provided Consent Form stating that you understand the nature of this research study and that all of your questions have been answered. Also, you have received a copy of the Consent Form for your records.

Your participation in this study is completely voluntary. You can choose to withdraw from participating in the study at any time. Do you have any additional questions about this study?

Participant Possible Questions:

- What is this research study about?
- Can you explain what you are being asked to do in this study?
- Please explain the risks involved in the study.
- How will your information be kept confidential?
- What do you understand about volunteering for this research study?
- What are your concerns about participating in the research study?

Participant Follow-Up Survey

1. For purposes of this research study, employee stress is defined as a negative emotional, physical, and energy experience accompanied by predictable behavioral, physiological and energetic changes that are directed either toward modifying the stressful event or reacting, accommodating, or exhausting to its effects. Using this definition, have you ever experienced employee stress at work? If yes, please describe your experience.
2. How do you cope with stress at work?
3. Why did you decide to participate in the research program?
4. What did you learn from participating in the research program?
5. What role does stress breathing play in your current life?
6. Please explain your experiences in participating in this research program.
7. What would you tell other people about the breathing program?
8. What additional information would you like to share with me?