

Self-Regulation and Heart Rate Variability Coherence: Promoting Psychological Resilience in Healthcare Leaders

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Abstract

Leaders within healthcare organizations strive to promote healing modalities for patients, and a healthy milieu that will support the delivery of high-quality, evidence-based, safe, and compassionate care. Behavioral responses to increased demands, competing priorities, hierarchical turmoil, and increased customer expectations place significant demands and stress on leaders. Healthcare leaders who operate under intense or chronic stress are likely to be at greater risk for errors in communication, medication administration, and spontaneous actions that result in adverse events.

Nursing turnover and burnout result in absenteeism translating to shortages on clinical units. Missed days from work create a cost burden and pose a significant financial loss to the bottom line of the organization. Therefore, this study explored the ability of healthcare leaders to reduce negative emotional states experienced at work by gaining self-awareness, demonstrating self-regulation, and building psychological resilience. Additionally, this research studied the impact of the resilience advantage and behavior modification training offered over a six-month timeframe. A number of areas were assessed: vitality, emotional wellbeing, ability to cope with stress, workplace effectiveness and performance, intention to quit, anxiety and depression, fatigue, and physical symptoms. Pre- and post-tests were administered using the Personal and Organizational Quality Assessment—Revised 4 Scale (POQA-R4) survey questionnaire, which provides an assessment of personal health and workplace quality.

The resilience-building training improved the healthcare leaders' capacity to become more self-aware and to recognize and self-regulate their response to stressors. Participants experienced reductions in stress, negative emotion, depression, and pressures of life and increased energy, vitality, peacefulness, and positive emotion. Results of this research suggest that the training in resilience-building and self-regulation skills may significantly benefit healthcare leaders by improving judgment, critical thinking, communication skills, and decision-making, while simultaneously reducing fatigue, anxiety, depression, anger, and resentment. Potential outcomes include fewer patient complaints, reductions in medical errors and adverse events, and decreased organizational liability. Finally, this study highlighted the value of self-regulatory and psychological resilience-building training to promote health and wellbeing for healthcare leaders.

Keywords: Coherence, Resilience & Psychological Resilience, Healthcare, Leaders, Happiness, Heart Rate Variability, Emotional Resilience, Values, Leaders, Amygdala, Parasympathetic, Sympathetic, Broaden and Build

Foreword

This dissertation journey has been a rewarding and enlightening experience for me. It has been a deeply spiritual moment in history where I was given permission to live in my core value (Christianity), and speak freely about how it relates to the individual who I am today. My mission is to give my nursing colleagues the ability to gain the valuable information that will transform them to health, wellness, and internal coherence.

My research focus area is indicative of the passion that I have for healthcare leaders, desiring them to walk in balance, ease, and composure. As a member of the healthcare team, I connected deeply with the participants who were in my study. My objective from the moment that the training began was to provide a safe place for them to be ministered to, heard, respected, and admired for the hard work that they do. I intended to re-ignite the passion that they had when they first received the notice that they had successfully passed their respective state board examinations.

To ensure that I walked in truth to my objectives, prior to beginning the training I relied on prayer and meditation to ask for inspiration on how to create high-levels of engagement from the participants. I desperately wanted to invite them into a new paradigm and state of empowerment filled with the opportunity to be the best that they could be, in whatever state that was. I admonished them to let me know if I was wasting their time or not making sense. It was imperative for me to know that they

were connecting with the very essence of this training and that they walked away from every session, refreshed, energized, and renewed, ready to save another life, rock another baby to sleep, and comfort another family that experienced a loss.

Now, let me tell you how this research has transformed me. I have been a registered nurse for 24 years and have experienced my share of intense stress and reward, working specifically as a certified critical care registered nurse. Many times during a shift, I experienced exhaustion, fatigue, frustration, and even burnout trying to keep up with the significant demands of being a registered nurse in critical care and experiencing the emotional rollercoaster rides that occurred moment-to-moment nearly every day. As I decided to write this Foreword, I wanted to ensure that I answered the question “why is this research relevant to you as the reader” or future researchers in this field. Let me introduce you to the events of June 30, 2013. I have always had great respect for what we do to serve our patients, but I have a heightened respect for healthcare leaders in every unit, department, and executive suite.

I was sitting in my home on this date in Mason, OH when I received a text message from R. R., Transitional Director at Yavapai Regional Medical Center (YRMC) in Prescott, AZ. She informed me that the Hot Shots, an elite group of firefighters specializing in forest fires, were in trouble and severely burned. The Hot Shots were (and continue to be) highly respected and regarded for the sacrifices that they made to fight the Granite Mountain fire and many others. R. R. explained that the Hot Shots

were caught in a significant fire with a wind shift that caught 19 of the 20 firefighters in the midst of the fire with temperatures reaching as high as 700 degrees. The emergency department staff at YRMC knew each of the Hot Shots well, as they had volunteered in the town of Prescott, brought patients to the emergency department for treatment, went to high school with children of the staff in the unit, and hung out in the unit as many fireman do in all emergency departments. Being proactive, the leaders within the emergency department had been notified of the anticipated arrival of the 20 brave men with severe burns who would require significant resources. Several healthcare professionals were called in to support what was expected to be severe third-degree and fourth-degree burns due to the massive fire at Yarnell Hill.

With the healthcare team awaiting the expected arrival of the Hot Shots, the team was ready; they were gowned up, with gloves on, waiting for squad doors to open at any moment. Per the account given by R. R., the adrenaline in the room, anxiety, and concern for the firefighters was significant. The team waited, and waited, and waited for approximately an hour with no word and no update, when finally, a firefighter ran in and announced to the healthcare team, “They are all dead except one... we lost them, they are dead.”

I pause on purpose to allow the reader to imagine what you would do in that moment. So, now that you have read about the tragedy of June 30, 2013, imagine that you, your spouse, your child, or your mother are the next patient in line after the entire

emergency department is in a state of shock due to the loss of 19 out of 20 Hot Shots. The healthcare leaders all had some kind of personal relationship with the Hot Shots: they knew them, went to school with their children, hung out with them in the emergency room, and some of them spent the night at the homes of some of the staff when they attended high school with their children.

As a patient, you have no idea of the trauma that they are experiencing. You have been waiting in the waiting room for hours, no updates, no explanations, and you are furious. How do you respond to that doctor or that nurse when he or she enters your exam room? How does the healthcare team in the emergency room shift gears, focus on you, and function at the highest level of excellence when they are in a state of shock?

In my opinion, this is why this research is important to all of us. We (healthcare professionals and healthcare organizations) must prioritize and emphasize programs for service workers who are under constant pressure, such as active duty military, veterans, police officers, healthcare workers, or clergy. We expect best-practice service delivery from these and other industries and we should demand that the people who serve us should be served themselves.

To all of my colleagues in the healthcare industry who give of themselves tirelessly every day giving high-quality, safe, compassion care, thank you for what you do,

bless you for your sacrifice, and may the peace of God abide in you to strengthen you as you minister to so many people. It is my true desire that this research will become the catalyst for healthcare organizations across the world to provide you with the gift of self-regulation and psychological resilience.

From the heart,

Denise

Resilience looks different to me now. It's a combination of physiological insight and mental clarity, emotional energy and buoyancy. I was hampered by what I did not know. I am more aware of what is really draining me. I am finding that I am bringing more to the table, more than I thought I could ever bring to the table. I find myself sleeping great, being more prepared for meetings, and the biggest surprise is that I did not expect to be more differentiated. That is empowering!

—Participant in this research study (see Appendix D, p. 140)

Dedication

This work is dedicated to my Lord and Savior Jesus Christ who has given me the opportunity to serve Him in everything that I do. To my mother and father, Bettye and Urle Brown, my loving and devoted husband, Mark Lackey, to my wonderful children, Jazmine, Briana, and Christopher, and my amazing family, I share with you this dissertation that is a testament to the importance that I place on lifelong education and learning. It is my sincere desire that you all embrace knowledge and utilize it to exceed all of your personal goals and aspirations.

The writing of this dissertation has been a tedious and collaborative undertaking. Many hours spent reading, researching, and writing to complete it would have been difficult without the support and encouragement of my dissertation committee, colleagues, and family members.

I would like to thank the faculty of The Center for Values-Driven Leadership and, especially, Dr. James Ludema, who helped me get into the Ph.D. program. Dr. James (Gus) Gustafson, my dissertation chair, guided me through the dissertation process and provided wisdom, support, and faith that we would complete this journey. I could not have completed this work without your support. Dr. Kim Cameron and Dr. Rollin McCraty brought considerable theoretical insights to my work, and I am forever grateful for the patience and commitment that you demonstrated. I emerged from our

discussions full of ideas, enthusiasm, and the confidence that with your assistance I would complete this journey.

Finally, to the healthcare executives, nursing leaders, and frontline caregivers who participated in this study, I appreciate your time, generosity, and sharing of experiences, and pray that I have accurately communicated the heart messages that you expressed during this study.

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Chapter 1: Introduction

People make errors, which lead to accidents. Accidents lead to deaths. The standard solution is to blame the people involved. If we find out who made the errors and punish them, we solve the problem, right? Wrong. The problem is seldom the fault of an individual; it is the fault of the system. Change the people without changing the system and the problems will continue.

—Norman (2002)

Competing Priorities and Stress for Healthcare Leaders

According to Shirey (2006), nurse managers are an integral part of creating a healthy work environment and model the way for nursing staff. Shirey also notes that retention of nurses is positively influenced when nurse manager stressors are minimized. Re-engineering of the health care industry has increased complexities in the environment, resulting in nursing turnover and shortages on nursing units. Nurses in intensive care unit (ICU) settings are drawn to that environment because the pace is quick, high-tech, and challenging. The same factors that draw ICU nurses to this demanding and stressful environment also make ICU nurses at risk for developing burnout due to end-of-life issues (Chlan, 2013, p. 66). Meltzer and Huckabay (2004) studied the effects of futile care (interventions and care delivery when goals are not achievable) on critical care nurses. Findings suggested that “feelings of emotional exhaustion leading to burnout in critical nurses are highly influenced by the frequency with which nurses are involved in life-sustaining interventions that conflict with the nurses’ values and standards” (p. 208). Critical care nurses are faced with end-of-life issues, such as maintaining patients on ventilators when life-sustaining measures are irreversible. Prolonged involvement with ethical issues impacts families, patients, and

caregivers on an emotional level (Doka, Rushton, & Thorstenson, 1994). Research suggests that continued exposure to stress and significant work demands can be compounded in professions requiring compassion and care as part of expected performance unless personal restoration and vitality are replenished and restored (Judkins, 2004; Pipe & Bortz, 2009; Beck, 2011; Schultz & Beach, 1999).

Marx maintains the main objective for healthcare executives and frontline nursing leaders is to learn from human error and promote a “just culture” where there is a balance between recognizing human error versus negligent or reckless conduct requiring disciplinary action. Reason (1997) refers to a “just culture” as being an atmosphere of trust when people are encouraged and rewarded for providing essential safety-related information that bridges patient safety and a safety culture. The “just culture” model addresses two questions: (a) What is the role of punitive sanction in the safety of our health care system, and (b) Does the threat and/or application of punitive sanction as a remedy for human error help or hurt our system safety efforts? (Marx, 2001).

Advances in patient safety, especially when involving the management of human error, depend upon our collective ability to learn from our mistakes—whether they are near misses or mistakes resulting in actual harm to a patient. To promote a culture in which we learn from our mistakes, organizations must re-evaluate just how their disciplinary system fits into the equation (p. 3).

Organizations are challenged to understand how current practices in discipline discourage healthcare workers from reporting serious events and create anxiety and

fear of retribution. The cumulative effect of medical emergencies, a fast-paced environment, fear of making a significant error, and fear of retribution provide a prescription for emotional exhaustion and the high probability for human error. Yukl (1989) summarized that competing priorities facing healthcare leaders create stressful environments and increase stress and anxiety in the midst of uncertainty. Extensive research confirms stress in health care as an issue of importance for both nurses and other healthcare leaders, according to employee surveys and multiple research studies (Institute of Medicine, 2004; Joint Commission, 2010; Reineck & Furino, 2005). Sleep deprivation adversely affects cognitive function among nurses (Scott, Hwang, & Rogers, 2006; Shirey, Ebright, & McDaniel, 2008; Shirey, Ebright, & McDaniel, 2013; Alhola & Polo-Kantola, 2007), resulting in fatigue and reduced amounts of energy. Pipe (2008) explains it is the role of the leader to ensure the best and most healing environment that will support the healthcare team members in conditions that often are plagued with stressful work demands on direct care providers (Judkins, 2004; Pipe & Bortz, 2009; Schultz & Beach, 1999). To support the emotional health of caregivers, attention must be paid to the constant demands of healthcare workers.

Evidence suggests that shifting the perspective from the negative event to a positive feeling state with an effective coping mechanism is an increasing and effective method of building resilience and agility among nurse leaders (Pipe et al., 2012). Individuals who develop the ability to focus on positive emotions during times of increased stress have demonstrated an ability to rebound from negative emotional

experiences (Tugade & Fredrickson, 2004; Tugade, Fredrickson, & Barrett, 2004). McCraty, Atkinson, Tomasino, and Bradley (2009) found that healthcare leaders must learn to manage the constant demands experienced in the work environment by effectively dealing with stress and sustaining one's resilience. In doing so, they learn to recognize and self-regulate the stream of ongoing thoughts and especially emotional undercurrents (judgment, negative projection, insecurity, worry, anticipated emergencies) that create incoherence and waste energy. As leaders begin to replace negative emotional undercurrents with feelings of more positive, regenerative attitudes and perceptions, a new baseline can be established, a type of memory that organizes perception, feelings and behavior (see Appendix D).

As a leader, this program has helped me deal with difficult situations and drama with more emotional composure and balance. I did not realize that I was letting stress build up; I actually did not realize I was overwhelmed until I started practicing this program. I started paying attention to my feelings and attitudes. I learned how to re-focus, calm down and my perspective and options would change. My new hires have stated in their evaluations of me that I am happy, calm, and very approachable. That feels great! (p. 137)

Impact on healthcare

The Joint Commission (2010) sites lack of teamwork, ineffective communication among caregivers and the interdisciplinary team, primarily between nurse and physician, as the main root causes of sentinel events. As previously defined, the Joint Commission defines sentinel events as:

A sentinel event is an unexpected occurrence involving death or serious physical or psychological injury, or the risk thereof. Serious

injury specifically includes loss of limb or function. The phrase, ‘or the risk thereof’ includes any process variation for which a recurrence would carry a significant chance of a serious adverse outcome. Such events are called ‘sentinel’ because they signal the need for immediate investigation and response. (Sentinel Event Alert section, para. 2)

O’Brien-Pallas et al. (2006) argue that nursing turnover is a significant factor in retention and the creation of healthy work environments. Nursing turnover represents another strong business case for the need of stress management programs designed for nursing leaders. The cost to healthcare organizations from nursing turnover ranges from \$22,000–\$64,000 per nurse turnover (Advisory Board Company, 1999).

Duffield et al. (2011) found that fewer nurses and increased patient workloads on medical surgical units were linked to negative patient outcomes (falls, medication errors). Boorman (2010) explains that business performance is negatively impacted by absenteeism, which is a major challenge costing the healthcare industry an estimated 7 billion dollars a year. Berwick and Hackbarth (2012) found that healthcare costs have risen to an unsustainable level, creating a demand for leaders to have an understanding of how to manage the business aspects of healthcare leadership. Accountancy, budgets, and productivity management create additional stress for leaders, requiring business knowledge and financial competency.

This study examines the impact of self-regulation and resilience building training on healthcare nursing and non-nursing executives from the following perspectives: improved self-regulation, improved self-awareness, and improved psychological

resilience. From the theoretical perspective offered here, leaders create an internal shift in perception allowing for improved self-awareness, self-regulation, and psychological resilience capacity by emphasizing positive feeling states and generating high levels of heart rate variability (HRV). Baumeister and Vohs (2007) explain self-regulation as “the self’s capacity for altering its behaviors. It greatly increases the flexibility and adaptability of human behavior, enabling people to adjust their actions to a remarkably broad range of social and situational demands” (p.1), and is defined as “the capacity of organisms (here, human beings) to override and alter their responses. It is the process by which people attempt to constrain unwanted urges in order to gain control of the incipient response” (p. 2). The ability to self-regulate requires four specific ingredients to complete the process and include: standards (a clear and well-defined set of rules), monitoring (tracking progress of goal completion), self-regulatory strength (appropriate levels of blood glucose to fuel the brains processes), and finally motivation (care about reaching goal). The term ingredient implies the need for all four elements to be present however, the authors note the ability of each ingredient to compensate for a missing ingredient and result in self-regulation (p. 3). Self-regulation facilitates good self-control and contributes to desirable outcomes, including task performance, success at school and work, and influences good social and interpersonal skills and mental health and adjustment (Baumeister, Heatherton & Tice, 1994; Duckworth & Seligman, 2005; Shoda, Mischel, & Peake, 1990; Tangney, Baumeister, & Boone, 2004). This study aimed to

teach healthcare leaders self-control and self-regulation using a biofeedback monitoring tool designed to promote HRV and psychological resilience.

McCraty and Childre (2010), describe HRV as the naturally occurring beat-to-beat variability of heart rate measured by an electrocardiogram . HRV is widely considered a measure of neurocardiac function that reflects heart-brain interactions and autonomic nervous system (ANS) dynamics. HRV is an indicator of health and wellbeing (Antelmi, 2004) and according to Matsuoka et al. (2005), high HRV is associated with reduced medical morbidity, increased longevity, and promotes higher cognitive functioning. Morbidity and mortality are associated with high HRV, which is a predictor of recovery from myocardial infarction (MI) (Carney et al., 2001). Conversely, low HRV is a predictor of risk for MI and sudden cardiac death. Of high importance and relevance to this study is HRV as an indicator of psychological resilience. “HRV is also an important indicator of psychological resilience and behavioral flexibility as well as the ability to effectively adapt to changing social or environmental demands” (McCraty & Childre, 2010, pp.13–14).

Decision making among healthcare workers is a primary role in stressful and non-stressful situations. Making the appropriate decision could impact a patient’s care and clinical outcome and should be made with mental clarity. Wang and Ruhe define the cognitive process of decision making as “a process that chooses a preferred option or a course of actions from among a set of alternatives on the basis of given criteria or

strategies” (2007, p. 73). High HRV can support better decision making for healthcare leaders in stressful situations by accessing higher cognitive centers of the brain. Araujo et al. (2006) suggest that HRV is a strong predictor of morbidity and mortality in both physical and psychological aspects of health. To promote health and well-being, participants in the intervention group received group education and coaching on the impact of anger, frustration, and stress on human physiology and were trained to generate HRV coherence. Coherence, defined by the *Random House College Dictionary*, is “the quality of being logically integrated, consistent, and intelligible” (“Coherence,” 1975). According to McCraty and Childre (2010), coherence implies correlations, connectedness, consistency, and efficient energy utilization. For example, when words or phrases fit together in an orderly manner the speech is referred to as coherent. In contrast, speech patterns with incoherent words and phrases presented in a nonsensical matter is referred to as incoherent. Strogtaz and Steward (1993) provide an additional definition of coherence as a state of coupling and degree of synchronization occurring between different oscillating systems that become either phase or frequency-locked as in photons in a laser. The frequency-locking state of oscillating systems is called cross-coherence and occurs in physiology when one or more of the body’s oscillatory systems become entrained and begin operating at the same frequency in the example of respiration and heart rhythms (McCraty & Childre, 2010). “Physiological coherence, also referred to as heart coherence or cardiac coherence, is a functional mode, measured by HRV analysis wherein a person’s heart rhythm pattern becomes more ordered and sine wavelike, at

a frequency of around 0.1 Hz (10-second rhythm)” (McCraty & Atkinson, 2012, p. 48; McCraty, Atkinson, Tomasino, & Bradley, 2009). The beat-to-beat variability is translated onto cardiac waveforms that can be viewed on a cardiac monitor, laptop, or other Apple devices such as an iPhone, iPod, or iPad. To provide context to the theoretical perspective offered within this study, Figure 1 outlines a continuum and progression, providing an overview of the concept of coherence to personal and organizational wellness, as found in the literature.

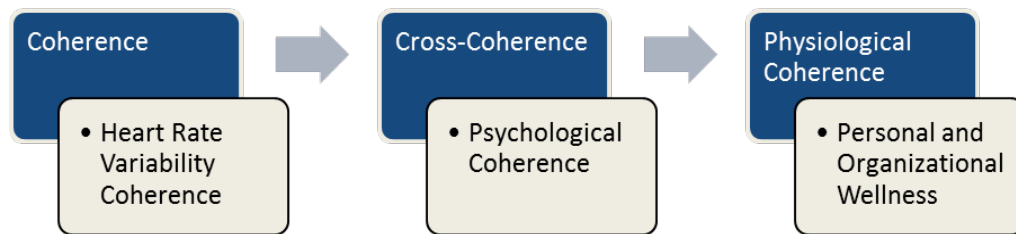
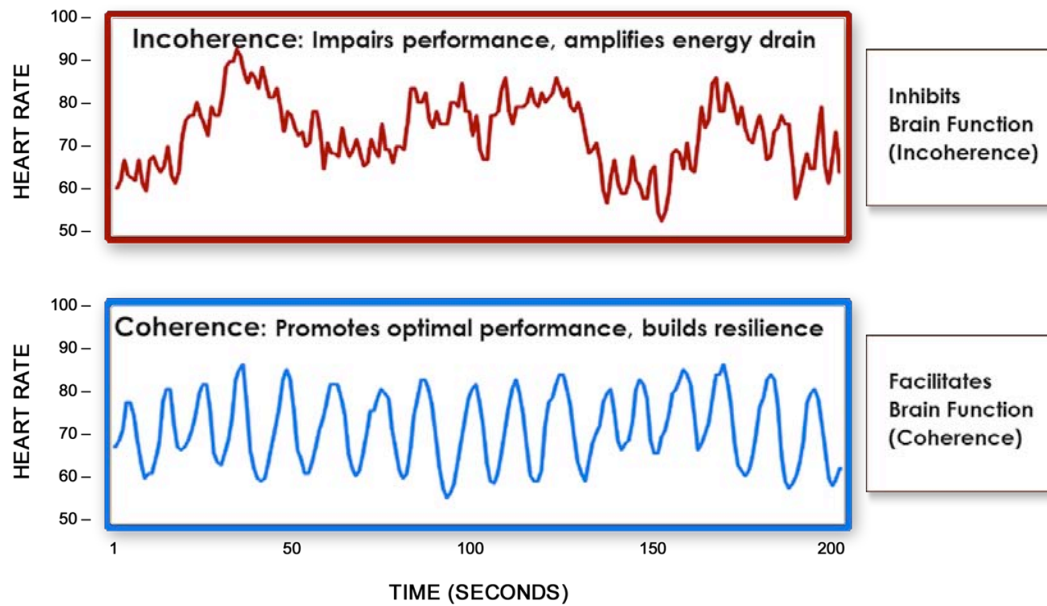


Figure 1. Progression of Coherence to Wellness

According to researchers at the Institute of HeartMath (2001, p. 18) emotions of frustration (incoherence or disordered) and appreciation (coherent or ordered) create different HRV patterns. Feelings of frustration are demonstrated in a waveform characterized by a random, jerky form. Conversely, emotional feeling states of appreciation create a harmonious, ordered, coherent HRV waveform pattern. Figure 2 shows incoherence and coherence waveforms.



© 2001 HeartMath. Used with permission.

Figure 2. Heart Rate Variability Patterns of Incoherence and Coherence

The term coherence is described as “a coupling and degree of synchronization between different oscillating systems” (McCraty & Childre, 2010, p. 10-11), and physiological coherence, is defined as “a degree of order, harmony, and stability in the various rhythmic activities within living systems over any given period of time” (p.11). Physiological coherence creates a harmonious ordered heart rhythm pattern known as the aforementioned, heart rate variability (HRV), evidenced to facilitate internal ease and balance in life processes. In contrast, erratic disharmonious, non-synchronous patterns reflect an incoherent system reflecting stress and inefficient utilization of energy in life processes.

Positive emotions of appreciation and compassion promote coherent states, whereas negative emotions such as anxiety, anger, and fear promote incoherence. McCraty's research demonstrated how feelings of frustration could facilitate "cortical inhibition" or chaos, which has the ability to hijack thoughts and prevent individuals from demonstrating appropriate responses. Conversely, feelings of appreciation can enhance "cortical facilitation" or coherence, allowing individuals to demonstrate appropriate responses in the moment. For example, when a registered nurse within an emergency department experiences the loss of a pediatric patient after administering advanced cardiac life support for 45 minutes, he or she may become exhausted, overwhelmed, and feel defeated. The family of the deceased child has been notified and is devastated by the loss of their child. Due to the duration of the life-supporting efforts by the healthcare team, patients in the waiting room become anxious, irritable, and angry. When the registered nurse encounters a disgruntled patient who is complaining about his or her wait time, she or he may impulsively respond in a less-than-desirable manner (cortical inhibition–chaos) because of fatigue, exhaustion, and frustration at the loss of the patient. The incoherence waveform in Figure 2 depicts this graphically. If, however, the registered nurse was empowered to self-regulate and facilitate an appreciative heart rhythm (cortical facilitation–coherence), he or she could choose to shift their emotional state from a negative feeling state to a positive appreciative feeling state, thus allowing him or her to take a personal "time-out" and respond from a place of inner ease and calm. Another example was discussed during

a mentoring session with one of the intervention participants during this research study (see Appendix D):

There was a crucial meeting that I had to attend. My heart was in my throat. I told myself to use “it” (the tools). (After using the tools) I felt the flush on my face fade, and my heart quit pounding. This was perfect! I am so proud of myself, I took myself out of the picture for a couple of seconds, and then I was able to come up with an option I had never thought of before. It was incredible, and my thoughtfulness made a difference in many people’s lives. (p. 137)

Participants in this research study were educated in the physiological implication of stress and wellbeing in preparation for training in self-regulatory, resilience building techniques. This research study utilized the Inner Balance technology on Apple computer devices to train participants in the intervention group to generate HRV coherence. The Inner Balance with the HeartMath Sensor for iOS technology developed by the Institute of HeartMath (IHM) provides an innovative approach to improve performance and wellbeing. Participants obtain real-time, precision feedback and training confirming the achievement of HRV coherence by connecting with positive feeling states (appreciation and care) as translated on the Inner Balance. Users have immediate feedback about their ability to re-set emotional states, shift to a coherent waveform, and create inner balance. Participants within the intervention group were asked to use the technologies at specified times daily: approximately 8 a.m., 12 noon, and 5 p.m. and when stressful events were anticipated or experienced (see Appendix D).

As a leader, I used to let the stress build and build until it overwhelmed me. I felt like I could not breathe. In the four weeks we

have been working together (with Mentor), I have done every homework assignment, I Prep, Sustain and Re-Set, and I use the Inner Balance on a daily basis. I now have focus and clarity; I do not let the stress build. My perspective on life has changed. My staff says I am calm, happy, and very approachable. My family feels like this program has been very beneficial to them! (p. 154)

Context

Participants in this study provide leadership to followers in complex healthcare organizations and have job expectations relating to improving operational efficiencies, clinical quality, and improving the patients' perception of the care received. The setting for this research is in two acute care hospitals in rural populated areas: Eastern Idaho Regional Medical Center in Idaho Falls, ID, and Yavapai Regional Medical Center in Prescott, AZ, a two-hospital system. I was introduced to both facilities as an account executive and consultant working for a leadership solutions firm. In this role, I consulted with both hospitals prior to this research study and hired interim nursing executives (on behalf of each facility) who were experts in the field. During the interim engagement our responsibility was to improve operational performance and provide leadership for nursing units with vacant managerial positions. During my conversations with both nursing executives as an account executive, it became apparent that leadership development training and providing education for the staff on how to effectively manage stress was in great demand. Both nursing executives were highly engaged and passionate about delivering clinical excellence for their patients, families, and communities. During

our discussions, they articulated a desire for leaders to possess tools to demonstrate business and clinical leadership competencies and facilitate healing nursing units, while maintaining personal resilience. Our discussions quickly transitioned to recommendations and approvals to participate in this research study designed to facilitate highly resilient, self-reflective leaders by equipping them with tools to enhance self-awareness and develop psychologically resilient healthcare leaders.

Study Genesis

I determined the subject of my research would be to assist healthcare leaders to manage stress, take control over their reactions to stressful events, and empower themselves and their teams to self-generate positive emotional states. A common challenge I experienced as a nursing executive was the inability to maintain composure and resilience while managing and leading within a complex health care industry. This encouraged me to follow up on previous discussions that I had had with two chief nursing officer colleagues about utilizing their leadership teams for my research on self-regulation and resilience. My recommendation was to engage healthcare leaders at each of their facilities in the resilience advantage program developed by IHM. The program uses their technology (Inner Balance) and a curriculum designed to increase leader awareness of the impact of stress on physiology, heart rate variability, communication, and energy expenditures.

A Worthy Exploration

The relevance of this research is related to the challenges within the healthcare system: nursing fatigue and burnout, nursing shortages, errors in communication, and adverse events. Frontline healthcare workers are faced with a changing internal and external organizational landscape, requiring leaders to demonstrate composure, manage stressful emergent situations, and make critical decisions impacting the lives of patients' families and the community. Research by McCraty, Atkinson, Tiller, Rein, and Watkins (1995) demonstrates the relationship that emotions have on human functioning, specifically enhancing physiological, psychological, and social functioning. McCraty's (2002, pp. 1-2) research on heart-brain neurodynamics is identified as an important physiological mechanism influencing cognitive functions, including decision making. Self-regulation is the neural communication between the heart, brain, and other biological systems, especially the communication via the afferent pathways. Educating frontline healthcare leaders about the impact emotions have on human functioning, decision making, self-regulation, and improved self-awareness improves the responses choices leaders make. As leaders make a conscious choice to shift emotional states to a place of ease and balance, healthcare leaders could reduce the risk of acting impulsively, which can cause devastating implications or outcomes for the patients they serve.

According to McCraty and Atkinson (2012, p. 63), the ability to gain skills to self-regulate targets stress at its source, helping individuals reduce or transform negative

mental and emotional responses before they occur and as the responses are experienced. Training in self-regulation provides the individual the ability to shift and reset more quickly when stressful events occur. Through research conducted over 20 years at IMH, McCraty and Childre (2010) have confirmed that the heart sends more neural traffic to the brain than the brain sends to the heart. Afferent feedback from bodily organs affects overall brain activity and influences cognitive, perceptual, and emotional processes. In this context, training leaders in bio-feedback supported resilience building techniques and facilitates a shift in physiological states to more coherent heart rhythms. Coherent heart rhythms change the pattern of afferent information sent to the brain, facilitating more ease, emotional stability, and a reduction in negative reactions to stress. Leaders trained to self-generate coherence heart rhythms prepare themselves to anticipate stress-producing influencers, react from a place of calm, and facilitate mental clarity when preparing to respond to a medical emergency, delivering a life-threatening intervention, or providing a patient or customer with less-than-desirable clinical results. Increasing self-awareness empowers leaders to anticipate stress triggers and their response to stress, facilitate information processing, build relationships with followers, develop the capacity to rebound from stressful events, and self-report improved perceptions on personal and organizational health.

This study brings a deeper understanding of the abundant evidence that HRV impacts emotions and feeling states, thoughts and attitudes, and directly impacts personal

health and performance. Additionally, evidence supports HRV as an assessment of resilience, which can be facilitated in training programs utilizing self-regulatory resilience building interventions.

Statement of Purpose

The purpose of this study is to explore and understand the impact of a self-regulatory and resilience building training intervention in the context of the healthcare industry.

The research questions were designed to demonstrate the ability of frontline leaders to shift perceptions, attitude, behaviors, and personal reactions in the face of stressful events, triggers, or challenges, ultimately building self-regulation and psychological resilience capacity. Thus, the research questions pursued in this study were the following:

1. Does the introduction of the HeartMath tools and emphasis on positivity affect self-regulation of leaders?
2. Does improved self-regulation lead to improved psychological resilience?

These questions are explored in the context of this dissertation.

Procedures for Exploring Research

This study employed an experimental methodology using a quantitative pre- and post-test design. The research investigator employed a convenience sample using healthcare leaders from the hospital facilities mentioned earlier whose chief nursing officers agreed to participate in the study. Participants within the intervention group

were selected by the chief nursing officers at each facility and voluntarily consented to the research study.

The philosophical basis for this method and approach has its origins in post positivistic worldview employing experimental strategy of inquiry, and pre-post-test measurements (Creswell, 2009).

Dual Role of Researcher and Practitioner

In this study, I am both scholar and practitioner. It was my passion for leadership that attracted me to scholarship. I attended the Ph.D./D.B.A. program at Benedictine University in Lisle, IL to gain a deeper perspective on scholarship in the context of leadership. As the practitioner in this study, I based the design of this program on the values-driven leadership (VDL) competency model developed by Gus Gustafson, Ph.D., and adopted by the Center for Values-Driven Leadership (CVDL) (see Appendix C). My purpose for implementing this design was to meet the request by each chief nursing officer. They wanted the research designed in a leadership development context that would provide a leadership model the organization could maintain upon completion of the research. Participants in the leadership development training included 42 employees within patient care services (executive leadership, clinical directors, managers, coordinators, and ancillary services leaders) division at Eastern Idaho Regional Medical Center (EIRMC), and 12 emergency services nurses (directors, managers, clinical coordinators, and a trauma coordinator) at Yavapai Regional Medical Center (YRMC). During the study, I intentionally isolated the

leadership development portion during the HeartMath training with the intervention group consisting of $n = 19$ at EIRMC and $n = 6$ at YRMC. Due to the overwhelming positive reception by the participants to the VDL model, I believe it is necessary to mention that the intervention group also participated in the values-based leadership training with the larger group.

Selection Criteria

Chief Nursing Officers (CNO) from each facility employed a nonrandomized selection process to identify participants for the intervention group. The intervention group of participants at each facility consented to a 4-hour training workshop developed by IHM, the resilience advantage (McCraty, Moor, & Lash, 2012), a resilience-building workshop introducing a non-invasive bio-feedback intervention designed to educate participants in the identification of heart rate variability (HRV) coherence. As participants connect with the feeling states of love, care, or appreciation, HRV coherence is facilitated, resulting in a reduction of stress and anxiety, and improvement in balancing emotions (McCraty, 2002 Lemaire, Wallace, Lewin, Grood, & Schaefer, 2011). All participants in the intervention group completed the 52-question pre- and post-Personal and Organizational Quality Assessment–Revised 4 (POQA-R4) questionnaire. The POQA-R4 is a validated and normed assessment that provides a broad overview of the participants' emotional stressors and social attitudes, vitality and physical symptoms of stress, and measures of workplace effectiveness (Barrios-Choplin, Atkinson, 1996).

Research Bias

Upon initiation of this research, I had personal opinions about the results of this training. My previous experience with the HeartMath tools gave me a sense that the participants would develop deeper relationships, greater respect and appreciation for one another, and gain a sense of how each member of the team contributes to the whole of the organization. I expected the results to demonstrate an improvement in personal and organizational quality, and confirmed my initial expectations based on data from the POQA-R4 that showed statistically significant improvements in personal and organizational quality.

Organization

There are four remaining chapters of this dissertation. Chapter 2 reviews past literature and studies within healthcare organizations that have participated in studies using the HeartMath technologies, as this appears most relevant to my study. I believed this research to be relevant due to the increasing complexities and uncertainty within healthcare organizations, which place significant demands on the leadership team to demonstrate positive clinical outcomes, financially viable departments, and highly satisfied customers while resources are diminishing, customer expectations are escalating, and corporate executives are unable to predict the future of healthcare. Chapter 3 provides demographical information for both facilities, methodological considerations, selection process, and research design. Chapter 4 outlines the results of the intervention followed by Chapter 5, which

summarizes the research findings, discusses implications for future research, and limitations of the study.

Chapter 2: Literature Review

Introduction

The literature search on self-regulation, psychological, and physiological resilience touches many disciplines. Several of the references used in this review crossed multiple disciplines, including psychological and physiological coherence, neuroscience, cardiology, alternative medicine, behavioral psychology, nursing, wellness, and mainstream medicine. In preparation for this study to determine the impact of the HeartMath self-regulatory and resilience building training intervention on participants, I researched studies on stress, heart rate variability (HRV) coherence, and the impact of stress on health and wellbeing, beginning with an overview of neurosciences research, an appraisal of coherence, and an overview of the exploratory findings in the context of the healthcare industry. This chapter summarizes my relevant findings of what is currently known within this area of research.

Neuroscience Research

Memory of past events plays a significant role in setting the stage for emotional perception, as well as the heart's role in emotional experience. Ratey (2001) contends that a unification of theory from the neurosciences overlaps with research in psychology, anthropology, linguistics, and philosophy. This unification versus contradiction provides a significant opportunity for individuals to better understand the relationship between the heart, brain, and behavior. The challenge, according to Ratey, is to replace the mechanistic model of the brain (neurosciences) to an

ecologically centered, systems-based view that better accounts for the human experience (p. 4). The brain assembles perceptions by the simultaneous interaction of whole concepts and whole images in contrast to the use of predictive logic of a microchip. In other words, Roney compares the brain to an analog processor relating whole concepts together, looking for similarities as well as differences. The brain does not assemble thoughts and feelings from tiny bits of data; rather, the brain remembers past experiences and hardwires previous events, which it recalls when similar experiences occur.

Amygdala activation

Cognition and emotion are both central and distinct functions mediated by separate but interconnecting neural systems. Research within the neurosciences has linked cognitive centers with emotional processing areas of the brain, as bidirectional neural connections communicating between the frontal cortex and the amygdala. These neural connections permit emotion-related input from the amygdala to modulate cortical activity and cognitive input from the cortex, ultimately modulating the amygdala's emotional information processing center (Pribram, 1975; LeDoux, 1994; LeDoux, 1996). According to Arnsten (1998) catecholamines, a family of neuromodulators (dopamine, norepinephrine, and epinephrine) are released in the peripheral and central nervous system during stress, turning on heart and muscles and turning off the stomach to prepare for fight-or-flight responses during stress (Davis, 1992; LeDoux, 1995). Opposing actions may turn on the amygdala and turn off the prefrontal cortex (a higher cognitive center, allowing for appropriate planning and

organization and appropriate behavior), changing behavioral control to the posterior cortical and subcortical structures (facilitating inappropriate responses, reliving emotional memory). During stressful events, the amygdala increases catecholamine release in the prefrontal cortex, which results in cognitive dysfunction (Davis et al., 1994). Research relating to activation centers in the brain are relevant to this study and explain biological processes that occur during stress. Mitigation or better self-regulation of these processes would be of great importance to lower negative stress responses in the moment, which allows for better decision making, appropriate behaviors, and communication for healthcare leaders.

Resilience Research

Social researchers in the 1970s began focusing on the differences between the ability of individuals and families to remain healthy and adapt in the face of adversity and risk. This area of focus was referred to as “resilience” and has gained a lot of attention as an important aspect of health and wellbeing. Walsh (2003) defines resilience as “the ability to withstand and rebound from disruptive life challenges” (p.1). Many definitions of resilience are noted in this review and do not represent all definitions identified within the literature.

Resilience as a construct has resulted in definitional ambiguity with numerous incomplete and dynamic definitions and pivotal terms (Luthar, 1993; Luthar & Cushing, 1999). Uniformity across theoretically similar adjustment domains must exist, but not across those conceptually distinct (Luthar, 1998). Progress in this field

has been impeded without an agreed-upon definition and a unified method of operationalization and measurable instruments. Bridges (1995) provides a definition consistent with that of the physical sciences, referring to a property of material that allows it to regain its original state or shape after being bent, stretched, or compressed. In this context, resiliency is defined as “the ability to bend and not break” (p. 57). Within the social sciences definition, resilience relates to living organisms being able to bounce back from adversity and provides the following definition: a personality trait characterized by bouncing back from negative experiences adapting to the constant changing life experiences (Block & Block, 1980; Block & Kremen, 1996).

Other definitions relate to one’s ability to maintain psychological stability, experiencing fewer mental health problems in the face of a threat (Bonanno, 2005; Bonanno, Wortman, & Nesse, 2004; Fredrickson, Tugade, Waugh, & Larkin, 2003). Additionally, resilience is referred to as a process encompassing positive adaption within the context of adversity (Luthar, Cicchetti, & Becker, 2000; Masten, 1994, 2001; Masten, Best, & Garmezy, 1990). Caza and Milton (2012) provide a review of the landscape of resilience and identify two consistent aspects of resilience relevant to this study, that emerged from the two previously mentioned definitions citing work from Luthar et al. (2000), Garmezy (1985, 1990), Cicchetti and Garmezy (1993), and Masten and Reed (2002). Resilience in the first definition requires a precondition of some negative stressor or exposure to a significant threat, while the second definition

relates to the individual's achievement of positive adaption in the face of this stress or threat. Luthar, Cicchetti, and Becher (2000) define positive adaption as demonstrating behaviorally manifested social competence. For example, in this definition, individuals are able to meet developmental tasks appropriate to their social and cognitive developmental standards (Masten, Best, & Garmezy, 1990; Masten & Coatsworth, 1998). In the environment of healthcare workers, the ability to meet developmental standards within the profession is an example of an adult's resilience in the process of career growth and requires a positive developmental trajectory. Sutcliffe and Vogus (2003) explain "(a)n entity not only survives/thrives by positively adjusting to current adversity, but also in the process of responding strengthens its capabilities to make future adjustments" (p. 97).

Resilience at work

According to Caza and Milton (2012) "resilience at work encompasses behavioral, affective, and psychological manifestations of positive adaption and professional growth" (p. 896). From this aspect, resilience at work is defined as a positive developmental trajectory characterized by demonstrated competence in the face of, and professional growth after, experiences of adversity in the workplace (pp. 895-896). Each individual responds in a different manner to challenges that they face, creating differences in those who succeed in the present and in the future. Negative experiences and events in the workplace, including burnout, impact poor personal and professional outcomes and do not affect all individuals in the same manner (Buunk & Schaufeli, 1993; Lee & Ashforth, 1993; Maslach, 1982; Maslach, 2001; Pines,

Aronson, & Kafry, 1981). It is noted, however, that in many instances individuals recover and demonstrate coping mechanisms better than others in the face of adversity (Pines et al., 1981). Research by Sutcliffe and Vogus (2003) confirmed that in many cases, individuals emerge from adversity with competency, efficacy, and growth. In this case, resilient individuals, groups, and organizations adapt positively during the adversity and risk, after the event is over. Caza and Milton (2012) suggest their definition of resilience at work “as a developmental trajectory characterized by demonstrated competence in the face of, and professional growth after, experiences of adversity in the workplace” (p. 896). Within this review, the authors further identify the research regarding resilience, suggesting that controversy exists regarding more specific aspects of the definition (Luthar et al., 2000; Masten, 1990; Masten & Reed, 2002).

Resilience: a Trait, Process, or Phenomenon?

Psychological resilience is defined as a fairly stable personality trait distinguished by the ability to bounce back from negative experience and by flexible adaption to the constant changing demands of life (Block & Block, 1980; Block & Kremen, 1996; Fredrickson et al., 2003; Tugade & Fredrickson, 2004; Tugade, Fredrickson, & Barrett, 2004) noting that persons are labeled as “resilient” or invulnerable” by psychological researchers implying that resilience is a fixed state (Luthar et al., 2000) or the process of coping with or overcoming exposure to adversity or stress (Meredith et al., 2011) or as a dynamic process, which changes over time and by situation (Luthar et al., 2000). Leipold and Greve (2009) define resilience as developmental

trajectory requiring explanation rather than it being a resource that explains a developmental outcome “a phenomenon defined by the success (positive developmental outcomes) of the (coping) processes involved” (p. 41). Caza and Milton’s (2012) definition of resilience is consistent with that of Sutcliffe and Vogus’s (2003), conceptualization of organizational resilience “as a developmental trajectory characterized by competence, efficacy, and professional growth in the face of work-related adversity” (Caza & Milton, p. 897). Caza and Milton point out that cultivating resilience at work should be viewed as a developmental process and therefore employers should not screen out employees based on the absence of demonstrating resilience at work, assuming it to be a fixed trait (p. 900).

Individual Protective Factors

Within the literature relating to psychological resilience, the terms risk factors and protective factors are used to describe an individual’s potential for resilience (Werner & Smith, 1982). According to Luthar, Doernberger, and Zigler (1993) and Rutter (1993), a risk factor represents an aspect of the individual or environment that makes the individual more likely than another to develop a specific negative outcome after experiencing adversity. Whereas, protective factor is an aspect of the individual or environment that reduces or eliminates the effects of risk factors, protecting individuals from the effects of risk factors (Tusaie & Dyer, 2004). According to Luthar, Cicchetti, and Becker (2000), protectant factors serve as a modifier of an individual’s response to a risk situation. As evidenced in the research by Caza and Milton (2012), three broad sets of protective factors promote resilience as outlined in

the literature: aspects of the individuals, characteristics of their family, and components of the wider social context (Garmezy, 1985; Luthar et al., 2000; Masten, Morison, Pellegrini, & Tellegen, 1990; Rutter, 1987, 1993; Werner & Smith, 1982). According to these findings, resilience at work emerges through a combination of individual social and organizational factors. In relation to this research, this study's emphasis will be directed to individual protective factors, which emphasize the importance of emotions in fostering resilience (repressive coping, positive emotions, positive feeling states) in response to stress (Fraley & Bonnano, 2004; Fredrickson et al., 2003; Tugade & Fredrickson, 2004; Mancini, Robinaugh, Shear, & Bonanno, 2009; McCraty, Atkinson, & Tomasino, 2003).

Individual Protectant Factors and Post-traumatic Stress Disorder

A recent study on resilience and post-traumatic stress disorder (PTSD), (Anderson and Bang, 2012) examined the impact among women exposed to domestic violence as children to determine the impact of protective factors and risk and their relationship to adult levels of PTSD. Sixty-eight females exposed to domestic violence as children were studied to determine differences in PTSD levels as adults. The findings concluded that women who were exposed to violent acts against their mothers and witnessed arrests experienced PTSD in adult years. The interesting finding about protective factors noted that women whose mothers worked full-time jobs, had significantly higher resilience than those who did not have full-time

employment. Additionally, adult women demonstrated lower resilience if their mothers had mental health issues.

Individual Protectant Factors and Emotions

Numerous studies provide evidence that emotions alter physiological functions.

Tiller, McCraty, and Atkinson (1996) confirmed that emotions of anger and appreciation lead to alterations in HRV, associating anger with psychophysiological incoherence and appreciation with psychophysiological coherence. Fredrickson (1998, 2001) describes the broaden-and-build theory correlating positive emotions with the ability to build upon an individual's momentary thought-action repertoires promoting personal, intellectual, social and psychological resources. Seligman, Rashid, and Parks (2006) utilized positive psychotherapy (PPT) to increase positive emotion engagement and meaning in the treatment of depressive symptoms effectively when compared with placebo interventions over a six-month period. Additionally, patients with mild-to-moderate depression noted significantly decreased levels of depression through one-year follow up, suggesting that supplementing treatments for depression with increases in positive emotion, engagement, and meaning supported the relief of symptoms of depression. For the purpose of this study, resilience is defined as the capacity or ability to prepare for, recover from, and adapt in the face of stress, challenge, or adversity (McCraty, Moor, Lash, 2012, p. 1).

Self-Regulation

Self-regulation and education

Initial research on self-regulation and children dates back to the 1960s when social learning researchers conducted research on self-regulatory processes such as self-reinforcement (Bandura, Grusec, & Menlove, 1967; Bandura & Kupers, 1964).

Numerous attempts are noted to integrate this research into general models of self-regulation (Bandura, 1977, 1986; Zimmerman, 1981, 1983). This seminal role in determinants of self-regulation and interconnectedness influenced the social learning constructs and assumptions within this body of research. Self-regulation in students is defined by Zimmerman (1986, 1989) as self-regulated to the degree that they are metacognitively, motivationally, and behaviorally active participants in their own learning process. Metacognitive processes are defined as referring to decision-making processes that regulate the selection and the use of various forms of knowledge.

According to Zimmerman (1989) “social cognitive theorists, self-regulated learning is not determined merely by personal processes; these processes are assumed to be influenced by environmental and behavioral events in reciprocal fashion” (p.330).

Personal factors operate as determinants influencing each other bidirectionally.

Cognition is a central role in self-regulation and self-reflective processes in sociocognitive functioning; however, self-regulated learning occurs to the degree that a student has the capacity to use their personal processes to regulate behavior and their learning environment in the moment. Self-efficacy is identified in social

cognitive theory as a key variable affecting self-regulated learning (Bandura, 1986; Rosenthal & Bandura, 1978; Schunk, 1986) and requires the ability to use learning strategies and self-monitoring.

According to Zimmerman (1989), a social cognitive approach to self-regulation provides three important advantages:

1. It distinguishes the effects of personal (self-) regulatory influences from overt behavioral ones and can explain the relative advantage of each.
2. It links students' self-regulatory processes to specific social learning or behaviorally enactive experiences and can explain the reciprocal impact.
3. It identifies two key processes through which self-regulated learning is achieved, self-efficacy perceptions and strategy use, and can explain their relation to student motivation and achievement in school (p. 337).

Self-regulation and Research from the Institute of HeartMath

Coherence and heart rate variability in emotions

Self-regulation is about making a choice to re-set in the moment to allow for a time-out, to reflect upon the situation, balance and refocus, and respond in an appropriate and carefully thought out manner. Applying self-regulatory resilience building techniques during moments of stress intervention participants in this research were able to reduce the impact of depleting emotions as quoted below (see Appendix D).

I say the biggest benefit is Re-Setting. This has been huge for me! I also like the Prepping! The last thing to go for me was the grudge. I couldn't let go of stuff. "Don't let it go...make yourself suffer." This is huge for me, when something was getting under my skin, I couldn't let it go. With this program and training, I chose to let it go. I noticed

calmness and I realized that there are bigger things in the world...I chose not to stay in the left hand side, in depletion. The biggest part was becoming self-aware. The other thing I've noticed is that I have taken the higher ground. I have a bounce in my step. I feel a tremendous sense of accomplishment. I feel better, because I have done the right thing. People have noticed that I have made changes. One person commented that I seemed lighter on my feet. These really, really work! (pp. 154-155)

Doc Childre founded the Institute of HeartMath (IHM) in 1991 and continues to study and develop techniques designed to reduce stress, build resilience, and optimize personal effectiveness. Childre, Martin, and Beech's (1999) book, *The HeartMath Solution*, confirms connections between the heart and brain physiologically, through heart rhythms that create balance by engaging feelings of love, which promotes health and influences how we think and feel. *The HeartMath Solution* presents a "solution" for facilitating optimal wellness, mental clarity, and coherence to promote optimal wellbeing by providing an in-depth overview of the intelligent heart and scientific research on the heart's role in influencing bodily systems and overall health. It offers three techniques: Freeze-Frame, Cut-Thru, and Heart Lock-In. Much of the research presented within this review refers to techniques developed at the IHM and utilized in studies to educate participants in self-regulatory techniques designed to promote health and optimal wellbeing and facilitate psychological resilience.

The Role of the Heart in Self-Regulation

According to McCraty, Atkinson, and Tomasino (2003) relationships between mind and emotions have been debated for decades. Perception, appraisal, arousal, attention,

memory, thinking, reasoning, and problem solving have been grouped together from a broader perspective of cognition or mental system. Feeling states spanning in intensity have been correlated with changes in the activity occurring in autonomic nervous system. Mounting evidence suggests that quality of life, motivation for our actions, and decision making are directly related to our emotions, which underlie the majority of the stress we experience. As previously discussed, the process of coherence occurs when connections of body systems relate in a synchronized manner. This state of biological coherence is referred to as cross-coherence and occurs in physiology when one or more of the body's oscillatory systems become entrained and begin operating at the same frequency as in respiration and heart rhythms (McCraty & Childre, 2010). The heart is the most powerful energy source in the body, generating rhythmic information patterns that consistently communicate with the brain and other body systems through multiple pathways: neurological (through the autonomic nervous system ANS), biochemical (through hormones), biophysical (through pressure and sound waves), and energetically (through electromagnetic field interactions). The heart, through its energy power, coordinates the body's oscillators and synchronizes the system as a whole (McCraty et al., 2009; McCraty & Childre, 2010). The extensive studies in the laboratory of the IHM have demonstrated that heart rate variability patterns are consistently the most dynamic and reflective changes in the emotional states of humans (McCraty et al, 1995). Participants in this research study found the personal sessions with the mentors provided the ability to

gain a better understanding of the science behind the techniques as illustrated below (see Appendix D).

When the mentor explained the science behind the Inner Balance APP, I understood Heart Variability in a way I had never understood that before. Sounds kind of funny coming from a nurse, but this all makes so much sense to me. I started practicing with the power spectrum and looking at the heart rhythm patterns in a whole new way. With that and the practice of the tools I was able to change my perspective, and I feel excited about my job again. (p. 135)

Heart rate variability and power spectral density

McCraty, Atkinson, Tomasino, and Bradleys research in *The Coherent Heart* (2009) provide theory and scientific evidence of the significance of coherence as an optimal psychophysiological state. Multiple interrelations between biological systems are presented from a systems view between psychological, cognitive, emotional, and neural communication networks where information and communication are integral to the understanding of psychophysiological interactions (p. 16). Evidence of the impact of wellbeing is presented suggesting the role of the heart in terms of biochemical, biophysical and energetic interactions, depicted in graph form in the following manner: mental focus (simple talk), psychophysiological incoherence (anger), relaxation (open-focus relaxation exercise), psychophysiological coherence (appreciation) (p. 74). The four psychophysiological modes are generated in humans during daily tasks. The authors define each mode in the following manner:

We have termed these modes *mental focus* (associated with impassive emotions experienced while attention is directed to performing familiar, cognitively engaging tasks or actions), *psychophysiological*

incoherence (associated with negative emotions such as anger, anxiety, etc.), *relaxation* (associated with calm emotions experienced while resting from the effort and stress of everyday life), and *psychophysiological coherence* (associated with positive emotions such as appreciation, care, compassion, etc.) (pp. 73).

Figure 3 shows a graphical presentation of the relationship between HRV and emotion demonstrating that certain psychophysiological states consistently emerge with distinct psychological and behavioral patterns of physiological activity with several systems in the body.

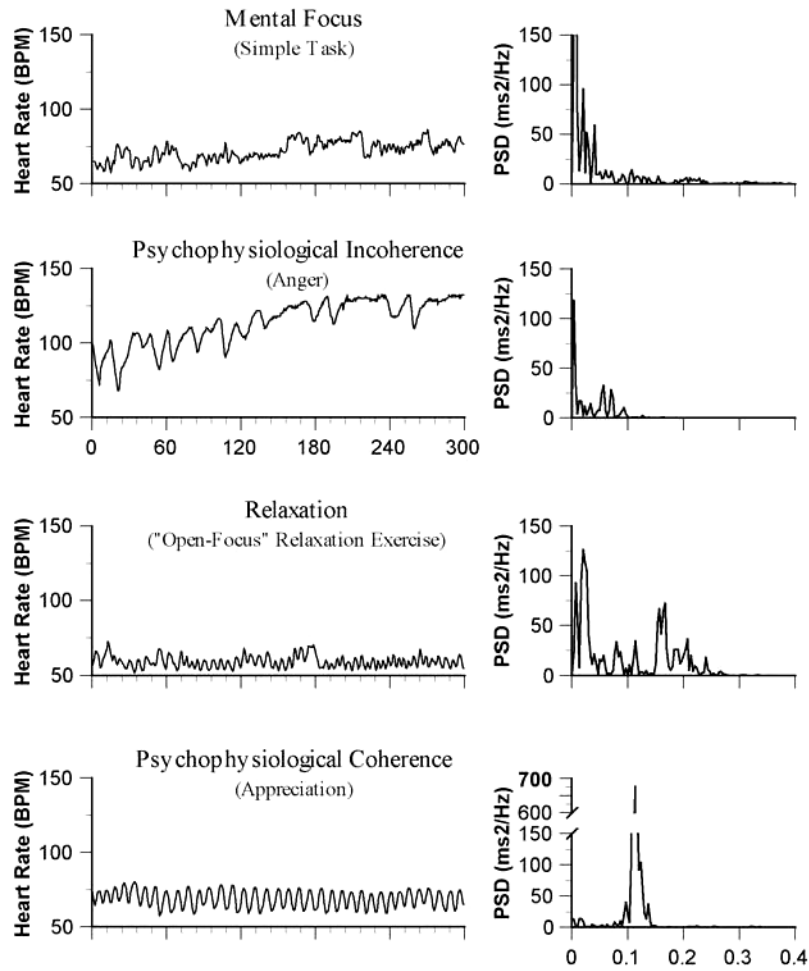


Figure 3. Heart rhythm patterns during different psychophysiological modes.

Graphs on the left are heart rate tachograms demonstrating beat to beat changes in heart rate. The right shows heart rate variability power spectral density (PSD) plots of the tachograms on the left. The findings from this study demonstrated that mental focus and high cognitive work load is characterized by a reduction in HRV.

Psychophysiological incoherence (anger) is characterized by a lower frequency and disordered heart rate as seen on the right side of power spectrum graph which demonstrates that anger is in a low frequency region. Relaxation presents in a higher frequency, indicating reduced sympathetic activity, reflecting an increased parasympathetic activity (the relaxation response). Finally, psychophysiological coherence is associated with sustained positive emotions (appreciation in this case), resulting in a highly ordered, sine-wave-like heart rhythm pattern which is associated with increased synchronization between the sympathetic and parasympathetic branches of the nervous system. Entrainment (synchronization) is depicted between the heart rhythm pattern, respiration, and blood pressure rhythms (p. 75).

Emotional stress, positive emotions, and psychophysiological coherence

Research done by McCraty and Atkinson (2006) studied autonomic balance by subjects trained in the Freeze-Frame technique confirming that sincere feelings of appreciation have an influence on biological oscillating systems, which can be synchronized through mental and emotional self-control, creating significant shifts in perception and cardiovascular function. The analysis of HRV provides a noninvasive

measure of neurocardiac function that indicates the relationship between heart-brain interactions and autonomic nervous system dynamics that are sensitive to changes in emotional states (Tiller, McCraty, & Atkinson 1996; McCraty, 2002). McCraty and Tomasino (2006) describe Freeze-Frame as a technique to assist with refocusing and shifting to a positive emotion in the moment, greatly reducing the stress created from emotional triggers and reactions. Three elements are key to the technique: *shift* (to the area of the heart), *activate* (a positive feeling), and *sense* (what is the best perspective or attitude for this situation).

Steps in the McCraty, Moor, and Lash (2012) Freeze-Frame technique consist of the following:

- Identify: Identify the problem or issue and any stressful feelings or reactions about it.
- Heart-focused breathing: Imagine your breath is flowing in and out of your heart area, which helps to calm your system. Take slow, causal, deep breaths. Inhale for 5 seconds and exhale for 5 seconds.
- Activate: Make a sincere effort to activate a positive feeling.
- Ask: From a more objective place, ask yourself what would be an efficient, effective attitude, action, or solution.
- Observe: Quietly observe any thoughts, feelings, or perceptions that could add clarity to the situation and commit to acting on them.

- If no insights come up, that is all right. Repeat the process later or the next day (p. 14).

Utilization of these and other techniques developed by the IHM have demonstrated repeated improvements in self-regulation and psychological resilience.

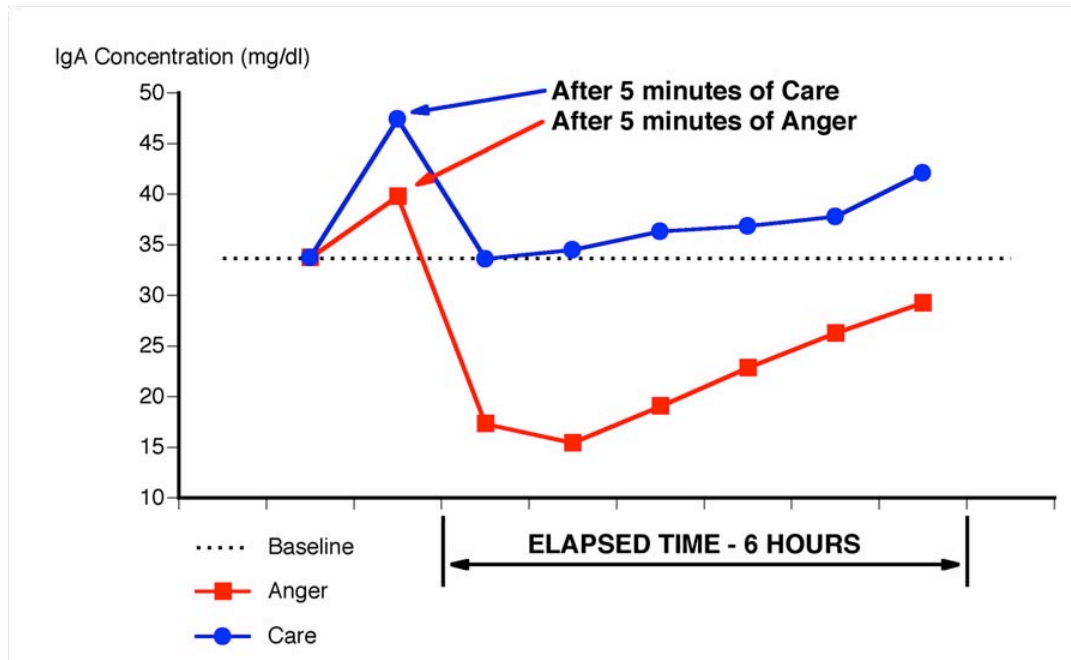
Self-regulation and the Early HeartSmarts program

Bradley, Galvin, Atkinson, and Tomasino (2012) researched the results of an evaluation study on preschool children to assess the efficacy of the Early HeartSmarts (EHS) program. EHS, developed by the Institute of HeartMath (IHM), is designed to guide teachers with methods supporting emotion self-regulation and key socioemotional competencies. The research was conducted over a one-year period with the Salt Lake City, Utah, School District. Social competence is introduced and described as having the ability to get along with others in a constructive manner, while building and maintaining positive relationships with others (Rubin & Krasnor, 1992). Social competence is rooted in self-regulation (Eisenberg, 2000). Demonstrating self-regulation involves one's ability to focus attention as needed by actively directing his or her behavior, emotions, and attention using effort and internal control, while inhibiting the expression of a behavior or emotion (Derryberry & Rothbart, 1997, p. 639). Results of the EHS study suggested that of the key socioemotional competencies in early childhood that create the foundation for future development, emotional self-regulation is core (Schoore, 1994).

According to Yang and Damasio (2007), relationships between emotion, social functioning, and decision making are interconnected in education and provide significant insight to the role of affect in education. They further state that neurobiological evidence suggests aspects of cognition, primarily learning, attention, memory, decision making, and social functioning are affected in a profound manner within the processes of emotions.

Physiological and psychological effects of compassion and anger

Research by Rein, Atkinson, and McCraty (1995) on the physiological and psychological effects of compassion and anger was noted to impact salivary immunoglobulin A (S-IgA) positively or negatively, depending on emotional states. S-IgA, heart rate, and mood were measured in 30 individuals before and after experiencing care or anger. Results suggested significant increase in total mood disturbance and heart rate, but not in S-IgA levels initially. However, from one to five hours after an emotional experience produced a significant inhibition in S-IgA levels, positive emotions produced a significant increase in S-IgA levels, as shown in Figure 4.



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Figure 4. The Physiological and Psychological Effects of Anger and Care

Psychological negative thought loops had a profound impact on physiological measures during a study of healthy adults utilizing the self-management techniques Cut-Thru and Heart Lock-In, which are designed to eliminate negative thought loops and promote sustained positive emotional states (McCraty, Barrios-Choplin, Rozeman, Atkinson, & Watkins, 1998). Salivary DHEA/DHEAS, cortisol levels, and autonomic nervous system function were assessed by heart rate variability analysis.

The study on immune system response utilized an experimental and comparison group and determined a significant increase in the positive affect scales of caring and vigor and significant decreases in the negative affect scales of guilt, hostility, burnout,

anxiety, and stress effects, with no changes of significant value in the comparison group. The experimental group had a mean 23% reduction in cortisol and a 100% increase in DHEA/DHEAS hormonal levels. Significant relation to DHEAS was the state warm-heartedness, whereas cortisol was significantly and positively related to stress effects. Eighty percent of the experimental group demonstrated increased coherence in heart rate variability (HRV) patterns during use of the techniques suggesting that techniques designed to eliminate negative thought loops may have important positive effects on stress, emotions, and key physiological systems. This research confirmed that attention on positive emotions significantly influence HRV. Further research indicates that this type of behavioral intervention provides a mechanism for impacting personal and organizational wellbeing.

Self-regulation and psychological health in diabetes

Patients with type 1 and type 2 diabetes (n=22) were trained in a two-day HeartMath self-regulation program. Self-reported measures of stress, psychological status, and quality of life were administered prior to and six months after the intervention. Hemoglobin A1c, cholesterol, triglycerides, and blood pressure were assessed. Results of this study demonstrated a reduction in psychological symptomatology and negative emotions, including anxiety, depression, anger, and distress post intervention. The findings also demonstrated increases in peacefulness, social support, and vitality, and reductions in somatization, sleeplessness, and fatigue. Reductions in sensitivity to daily life stressors were reported after intervention, and quality of life improved significantly. Regression analysis revealed a relationship

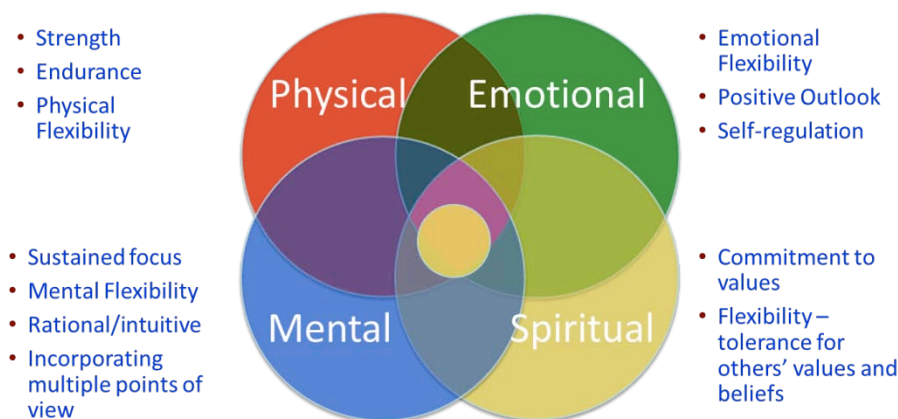
between a self-reported practice of the technique and the change in HbA1c levels in patients with type 2 diabetes, noting a relationship between practicing the interventions produced reductions in HbA1c levels. This study suggested that the HeartMath emotional self-regulation intervention creates a reduction in stress, improves psychological health, enhances quality of life, and may assist to improve glycemic control in individuals with diabetes (McCraty, Atkinson, & Lipsenthal, 2000).

Self-regulation and psychological stress in police officers

Research of police officers by McCraty and Atkinson (2012) confirmed that the ability to self-regulate is vital to reducing various acute and chronic stressors endured in this field of work. The constant stress and anticipation of stress imposes a significant burden on both physical and psychological health. In this study, police officers were trained in the Coherence Advantage program from IHM, designed to build and sustain resilience.

Police officers were introduced to the term *physiological coherence*, also known as heart coherence or cardiac coherence, or a degree of order, harmony, and stability in various rhythmic activities within living systems over any given time period (Tiller et al., 1996, pp. 53-54). Physiological coherence represents increases in emotional and perceptual stability and alignment among physical, cognitive, and emotional systems directly responsible for the quality of many cognitive functions and optimal performance. McCraty and Akinson (2012, p. 49) suggest the ability to self-manage is

directly related to building and sustaining resilience and efficient utilization and energy resources across four domains: physical, emotional, mental, and spiritual. Figure 5 demonstrates the four domains: physical, emotional, mental, and spiritual, that are able to build and sustain resilience when self-management and efficient utilization of energy resources is applied.



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Figure 5. The Four Dimensions of Resilience

Demonstration of the effectiveness of the resilience building techniques was experienced by several of the participants including the personal testimony of one intervention participant in this study (see Appendix D).

I had an attitude adjustment! I now am going into “this” with a much more open mind. Before this program I was just existing, things would just present and I would take care of it. I did not have any get up and go. I had no idea how depleted I was and not in just the physical domain, probably all domains. I now have more energy. I can handle things. I noticed that my staff wants to talk to me more, and not just about complaints. I feel lighter. (p. 141)

During this program, participants were educated in the dimensions of resilience:

- Physical resilience—Building flexibility, endurance, and strength
- Emotional resilience—Demonstrated when individuals are able to self-regulate and have a positive outlook and supportive relationship.
- Mental resilience—Provides the ability to have multiple points of view, sustain focus, attention, and mental flexibility.
- Spiritual resilience—Indicative of a commitment to core values, paying attention to intuition, and tolerating the values and beliefs of others.

Participants were taught self-regulation skills using heart rhythm coherence feedback monitors (EmWave devices), which use a pulse sensor as a noninvasive measurement of the beat-to-beat heart rate. EmWave monitors display the participant's heart rhythm in real time and calculate the level of heart rhythm coherence achieved.

According to this research HRV coherence feedback resulted in health benefits for the participants and has been shown to significantly improve outcomes in PTSD, depression, asthma, congestive heart failure, hypertension, anxiety, fibromyalgia, and insomnia (p. 51). McCraty and Tomasino (2006) found coherence-building techniques utilized by the participants facilitated a shift in physiology into a more coherent state, ultimately creating an alignment of all four energetic domains.

Participants were surveyed using the Personal and Organizational Quality Assessment—Revised 4 Scale (POQA-R4) (McCraty et al, 1998; Barrios-Choplin & Atkinson, 1996). Results indicated a high degree of physiological arousal in heart rate

and blood pressure that was elicited by discussions of scenarios that the officers knew happened in this field of work despite the fact that they were not real life situations. The intervention taught self-regulation skills leading to a measurable shift in the following areas: (a) physiological functioning or heart rate and blood pressure, (b) increased awareness and self-management of stress reactions, (c) reduced distress, anger, sadness, and fatigue, (d) reduced sleeplessness and physical stress symptoms, (e) increased peacefulness and vitality, (f) reduced competition, improved communication, and great cooperation within work teams, (g) improved work performance (h) greater confidence, balance, and clarity under acute stress, (i) quicker recalibration following acute stress, and (j) improved listening and relationships with family.

HeartMath Studies in Healthcare

The following studies confirm the impact of the HeartMath biofeedback-supported self-regulatory and resilience building training programs on healthcare professionals and or patients within hospital settings. The review confirmed that no prior research study had be implemented using a leadership development context. Additionally, none of the previous research studies employed a mentorship component to strengthen the knowledge, usage, and physiological training of intervention participants.

Fairfield Medical CenterFinancial return on investment

According to Newsome, Pearsall, Ryan, and Starlin (2014), the Fairfield Medical Center, located in Lancaster, OH, noted statistically significant cultural and financial return on investments in the following three areas: employee satisfaction, absenteeism rates, and healthcare claim costs after training 975 employees in the Transforming Stress Workshop developed by IHM. The most significant change was seen in absenteeism rates, which was tied to a culture of change in the organization, resulting in a \$94,794 savings to the organization. This research study demonstrated a positive return on investment from investing in employees' health thru the workshop offerings that supported reductions in personal stress.

Children's Hospital Colorado

Johnson, and Griffin (2014) at Children's Hospital Colorado (Aurora) engaged HeartMath to reduce stress and fatigue for their healthcare workers. The program, HeartMath/Caritas workshops, consisted of six 1-hour workshops offered to every employee as part of a wellness program. Results of this program illustrated the positive effect that the workshop had on participants, both qualitatively and quantitatively. The quantitative results were based on written feedback; the quantitative results showed improvements in personal quality in the following areas based on self-reporting: improved life fulfillment and calmness, reductions in feeling worried and cynical, physical reductions in rapid heartbeats, and muscle tension.

Mayo Clinic Hospital

The nursing leadership at Mayo Clinic Hospital in Phoenix, AZ, engaged HeartMath to further establish a high-quality, safe, and effective patient-centered care environment (Pipe et al., 2012). The objective was to support the healthcare team by utilizing a positive approach and empowering nurses and other members of the health team with skills and techniques designed to transform stressful situations to therapeutic scenarios. Sixty-three individuals from an oncology unit participated in the HeartMath training program providing “in the moment” techniques that assist staff in dealing with the significant amounts of stress experienced on oncology units. A pre- and post-intervention survey using the POQA-R4 was utilized over a seven-month period. Statistically significant results were confirmed for each of the following personal indicators: positive outlook, gratitude, motivation, calmness, fatigue, anxiety, depression, anger management, resentment, and stress symptoms. Organizational indicators demonstrated statistically significant results in goal clarity, productivity, communication effectiveness, and time pressure. Additionally, when the HeartMath-supported self-regulatory and resilience building training program was offered for nursing leadership, improvements in turnover of oncology staff and improved employee and patient satisfaction scores relating to nursing care were reported, confirming the impact on personal and organizational well-being.

National Health Service, United Kingdom

Riley and Gibbs (2014) engaged HeartMath in a pilot program from August 2011 to October 2011 in the United Kingdom. The HeartMath Revitalizing Care Program was

instituted in four clinical wards within the National Health Service (NHS) healthcare system. Objectives of the program were to enhance the overall patient experience, build resilience for staff, and promote improvements in time management and personal stress levels. Pre- and post-measures were used at initial survey (Time 1) and after training with biofeedback technology and interventions (Time 2) using the POQA-R4. Results confirmed improvements in nine of ten personal qualities categories, eight of which were statistically significant, with fatigue and calmness demonstrating the most significant changes. Due to the short time frame of the study, organizational improvements did not demonstrate significant results.

Kaiser Permanente Santa Clara Medical Center

Goldfisher, Hounslow, and Blank (2014), senior and nursing leadership at Kaiser Permanente Santa Clara Medical Center (CA), engaged 400 nurse leaders and support staff in a 12-month training program between June 2011–June 2012 to support the Caring Sciences framework, which fosters caring-healing environments and reinforces helping-trusting relationship amongst caregivers and patients. Two hundred and sixty-three participants completed pre- and post-surveys. Results of the research demonstrated eight of fourteen metrics showing statistically significant changes in work attitude, goal clarity, communication effectiveness, time pressure, intention to quit, strategic understanding, and productivity. Additionally, improvements were demonstrated in well-being, quality of life, patient satisfaction, safety, and reduction of absenteeism.

Indiana University Health Bloomington

McKinley (2014), a physician at the Indiana University Health system in Bloomington, IN, studied the impact of self-regulation and HRV with his patients diagnosed with autonomic sensitive disease states and chronic diseases. Exclusions included patients with arrhythmias, pacemaker dependence, psychosis, active mania, and severe personality disorders. Patients were educated in the physiology of their disease process and were trained to generate HRV using the emWave software in one-to-one (1:1) coaching sessions. Additionally, patients were taught deep inspiratory breathing and visual imagery techniques. The results of this study demonstrated improvements in HRV amplitude and or reduction in very low frequency spectrum in 36 of the 42 participants. Reports of increased “feeling of control” was self-reported by many of the participants. Within this group, 9 of 18 patients medicated with benzodiazepine medication were weaned from medication use during the study period.

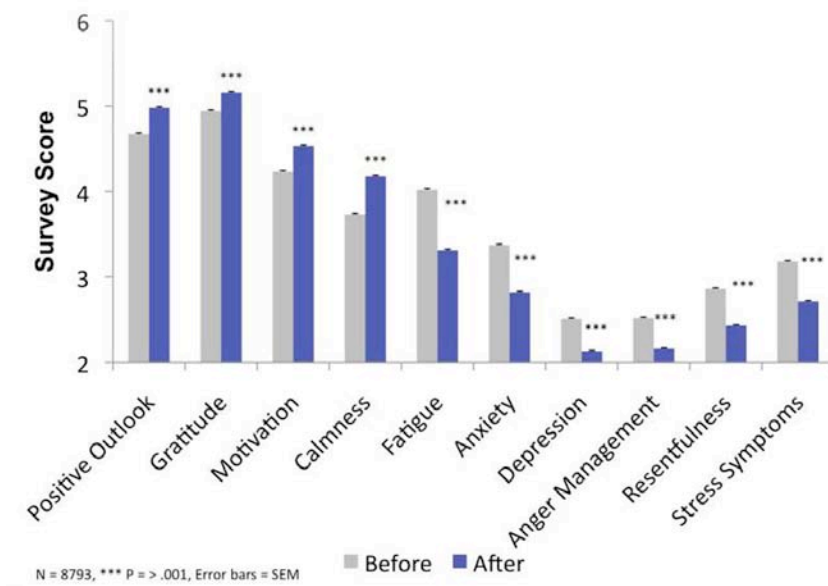
Research conducted by Larkey and Hector (2014), affiliated with the Office of Cancer Prevention and Integrative Medicine; College of Nursing and Health Innovation, and Arizona State University assessed the affectiveness of the HeartMath heart coherence training (HCT) in 12 hospitals over three or more years. Participants were healthcare workers, female, $n = 4862$ (89%), male, $n = 535$ (11%), with a median income of \$40,000–\$49,000. The study’s research questions were: (1) Is there a trend for improvement in baseline POQA-R4 scores over time indicating

“coherence contagion,” defined as the transmission of positive affect to other workers via shifts toward more heart-centered communication? and (2) Are program implementation factors associated with variation in trends per hospital? Scale scores for improvements in personal quality measured positive outlook and fatigue, and organizational quality measured commitment and intention to quit for participants receiving the HeartMath training. Results of the study demonstrated four hospitals with improvements ranging from 8%–20% changes, demonstrating steady, moderate to large improvements from baseline to post scores (2–4 weeks after training) for “positive attitude,” “depression,” “fatigue,” “anxiety,” and calmness”. Minimal improvements of 1%–5% were seen in four hospitals, and four hospitals showed steady declines. Data for national scores on the Hospital Consumer Assessment of Healthcare Provider and Systems demonstrated a minimum but steady increase between 2007–2012 (73% increase to 78% rating of “always” for nurse communication ratings). The most effective outcomes were demonstrated and correlated with (a) a high level of initiation/sponsorship, and (b) indications that either high-level managers or supervisors sponsored workgroups for the entire group to attend. With large group attendance, the researchers confirmed a higher level of saturation of workgroups receiving HCT and practicing heart rhythm coherence. Implementation of the program was a factor and demonstrated that hospitals with declining scores used one of two methods for the implementation: open enrollment method or a combination of open enrollment and hospital-wide groups attending. This

research concluded that implementation of HCT training should emphasize strong leadership support and sponsorship of specific workgroups.

Meta-analysis of 8,793 Health Care Workers

Meta-analysis data on studies utilizing the Institute of HeartMath (IHM) intervention demonstrated statistically significant results using the POQA-R4. The POQA-R4 survey is a 52-item, validated, and normed assessment that provides a broad overview of an individual's emotional stressors and social attitudes, vitality and physical symptoms of stress, and measures workplace effectiveness (McCraty & Atkinson, 2012; Barrios-Choplin & Atkinson, 1996). Results of the meta analysis demonstrate pre- and post-survey for Time 1 and Time 2. The data shown in Figure 6 represent similar studies by independent researchers conducting studies on health care workers.



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Figure 6. Meta-analysis of 8,793 Health Care Workers

Lowering blood pressure in hypertensive patients

Alabdulgader (2012) studied the efficacy of teaching emotional self-regulation techniques utilizing heart rhythm coherence training (emWave Personal Stress Reliever) to quickly lower blood pressure (BP) for patients diagnosed with hypertension (p.54). This study represented the ability to immediately lower BP utilizing this self-regulation technique on patients with hypertension.

Lowering blood pressure in employees with hypertension

McCraty, Atkinson, and Tomasino (2003) studied the impact of a workplace-based stress management program on blood pressure (BP), emotional health, and workplace-related hypertensive employees. The purpose of study was to evaluate the impact of a self- management program, Inner Quality Management developed by IHM, on reducing BP and improve emotional health for employees with hypertension. The program educates individuals in practical self-management techniques designed to reduce stress and negative affect, increase positive affect, enhance health, and improve business performance. The study substantiated the feasibility and short-term efficacy of the program in a workplace-based stress reduction program for individuals with hypertension within a relatively short period of time.

Significant evidence support the beneficial outcomes of the IHM techniques: Impacting physiologic balance in a favorable way, reducing sympathetic arousal, increasing parasympathetic activity (McCraty et al., 1995; Tiller et al., (1996),

reducing cortisol levels, and increasing dehydroepiandrosterone (DHEA) (McCraty et al., 1998).

Recap of Findings

As evidenced by this review, much of the research done on resilience relates to the relationship between emotions and physiological or psychological factors. During stressful events, the amygdala increases catecholamine release in the prefrontal cortex, resulting in cognitive dysfunction (Davis et al., 1994), which can have devastating implications for employees and patients in healthcare organizations. Research relating to activation centers in the brain are relevant to this study, and explain biological processes that occur during stress. Mitigation of these processes would be of great importance to manage stress responses in the moment, allowing for better decision making, appropriate behaviors, and communication among healthcare workers. Literature discussing resilience at work, (Caza & Milton, 2012) suggest a favorable process develops in individuals resulting in a positive developmental trajectory characterized by demonstrated competence in the face of, and professional growth after, experiences of adversity in the workplace. This finding is of great importance to healthcare workers, as many of the specific roles and activities are competency-based, requiring high-level functioning of registered professionals to provide safe, high-quality, and accurate delivery of healthcare services (p. 895).

Individual resilience involves three broad sets of protective factors that promote resilience at work: Aspects of the individuals, characteristics of their family, and

components of the wider social context (Garmezy, 1985; Luthar et al., 2000; Masten, Morrison, Pellegrini, & Tellegen, 1990; Rutter, 1987, 1993; Werner & Smith, 1982) could have considerable impact on the design of an effective program that could possibly encompass any of the three factors in combination in promoting psychological resilience.

Research suggesting that individuals demonstrating an ability to self-regulate emotions, emphasize positivity, and rebound from adverse events were able to improve physiological and psychological well-being and contribute to improved organizational performance is critical to the well-being of healthcare workers. Childre (1998) emphasized physiological coherence, heart rate variability, and the Freeze-Frame tool as a means of reducing stress and gaining peace and clarity in the moment. Rein, Atkinson, and McCraty (1995) researched the impact of physiological and psychological effects of compassion and anger and confirmed the negative impact of salivary immunoglobulin A when experiencing anger, and the positive impact of salivary immunoglobulin when experiencing care. McCraty et al. (1998) further emphasized the impact of a self-management program on stress, emotions, heart rate variability, DHEA, and cortisol during a study of healthy adults trained in Cut-Thru and Heart Lock-In. Findings suggested the techniques eliminated negative thought loops that had positive effects on stress, emotions, and physiology. McCraty, Atkinson, and Lipsenthal (2000) concluded that the HeartMath emotional self-

regulation intervention program improved psychological health and wellbeing by reducing stress and improving glycemic control in individuals with diabetes.

Research in the field of positive psychology have linked the theory of broaden and build with positive emotions (Fredrickson, 1998, 2001; Tugade & Fredrickson, 2004; Tugade, Fredrickson, & Barrett, 2004), and confirmed that individuals focusing on positive emotions during times of increased stress demonstrate the ability to rebound from negative emotional experiences, providing significant evidence that individuals have the capability to embrace positive emotions to promote health and well-being. Based on the findings of this literature review, this study can conclude that substantial evidence exists supporting the use of the HeartMath tools in building self-regulation and psychological resilience among healthcare leaders. Several questions and or opportunities emerge from my previous findings, which will be outlined in the next statements.

No consistent model or framework. What I didn't find from this literature review was a consistent model or framework for delivery of the Institute of HeartMath (IHM) interventions. Evidence of training was demonstrated in each of the programs as the trainers received certification by IHM, providing consistency in the training programming, materials, and structure to present the intervention to each participant. Most training occurred in workshops, train the trainer programs, or champions were identified to ensure consistent use of the techniques on nursing units. There was no

evidence of a previous program using a leadership development approach as a framework.

Evidence of sustainability. Long-term sustainability and efficacy of psychological resilience will provide solid evidence of the long-term ability to sustain health and wellbeing of participants. This review substantiated the short-term effects of HeartMath interventions on participants, but did not demonstrate evidence of long-term sustainability.

Mentorship and coaching. No evidence was found in previous studies where independently certified mentors were used during one-to-one phone calls to deepen the learning of interventions and provide each participant an opportunity to ask specific questions about the HeartMath training.

The finding from this literature review shed light on opportunities to develop a framework around leadership development elements that could potentially strength leadership competencies by promoting inner balance, mental clarity, and positive emotional responses in the context of leadership challenges.

Chapter 3: Method

Research Approach

This research employed an experimental quantitative pre- and post-survey design with hospital leaders within patient care and emergency services departments in the context of a leadership development program. Total number of participants in the leadership development program consisted of $n = 52$ with participants in the intervention group totaling $n = 25$. All participants received leadership development training by researcher using values-driven leadership (VDL) competency model (see Appendix C) modified for the healthcare arena. The pre- and post-design was utilized to analyze different responses from participants before and after training by the researcher. The definition of resilience, adopted for this research study, is defined as the capacity or ability to prepare for, recover from, and adapt in the face of stress, challenge, or adversity (McCraty, Moor, & Lash, 2012). The objective of this research study was to promote self-awareness, self-regulation, and psychological coherence, using heart rate variability (HRV) coherence.

Research setting

The study consists of two hospital systems, Eastern Idaho Regional Medical Center (EIRMC) located in Idaho Falls, ID, and Yavapai Regional Medical Center (YRMC) located in Prescott, AZ.

Yavapai Regional Medical Center

YRMC, a not-for-profit, community-based hospital, offers general medical and surgical services, operating approximately 134 acute care beds. Adult specialties include gastroenterology and gastrointestinal surgery, geriatrics, nephrology, neurology and neurosurgery, orthopedics, pulmonology, and urology. Sampling for the research project consisted of emergency room registered nurses from a not-for-profit two-hospital system in rural Arizona with the sampling frame consisting of charge nurses, trauma coordinator, clinical coordinators, nursing managers, and directors ($n = 6$). Participant demographics: Gender: Males = 2 (33%); Females = 4 (66%); Race: Caucasian 100%.

Eastern Idaho Regional Medical Center

Eastern Idaho Regional Medical Center a for-profit, community-based general medical and surgical hospital operating approximately 309 acute care beds. Adult specialties include gastroenterology and gastrointestinal surgery, geriatrics, nephrology, nephrology and neurosurgery, orthopedics, pulmonology, urology, and pediatrics. Sampling consisted of multidisciplinary inpatient leaders from a for-profit rural hospital in Idaho with leadership job titles: chief nursing officer, assistant chief nursing officer, clinical nursing directors, managers, nursing and ancillary supervisors, and clinical educator within patient care services. Non-clinical inpatient leaders ranged from managers and directors from the laboratory, radiology, and administration, ($n = 19$). Participant demographics: Gender: Males = 7 (37%); Females = 12 (63%); Race: Caucasian 100%.

Selection criteria

To address the research question, the chief nursing officer (CNO) of both hospitals individually met with the researcher to discuss the protocols for the study. No exclusion criteria were identified. Each CNO selected the intervention group to be trained in the HeartMath behavior modification techniques from each individual hospital. Total participants enrolled in the intervention group consisted of 9 males and 16 females ($n = 25$). Participation in the research study was voluntary with inclusion criteria only. All participants were required to be employed by the facility functioning in a leadership capacity, remain employed during the time of the intervention, and agree to complete a pre- and post-52-question paper-administered Personal and Organizational Quality Assessment–Revised 4 (POQA-R4) instrument. The POQA-R4 was selected as the instrument for this research study due to the validity and reliability testing previously done among healthcare studies.

Methodological Considerations

Participants in the intervention group received training using a biofeedback-supported self-regulation and resilience building intervention, Inner Balance technology, developed by the Institute of HeartMath (IHM). A total of 25 participants, 19 hospital leaders from patient care services in Idaho Falls and six leaders from emergency services. Results from both hospital facilities were combined for the intervention group. The names and last four social security numbers were documented on the pre- and post-surveys to differentiate each participant for data analysis.

The Resilience Advantage—Skills for Personal Effectiveness

The goal of the Resilience Advantage program is to build and sustain the resilience of individual health care leaders and diminish the symptoms of operational stress, significantly reducing the development of more serious and chronic stress injuries. To achieve this goal, healthcare leaders were trained to be more self-aware and self-regulated, empowering them to manage negative emotional states during stressful situations. The Resilience Advantage program provides self-regulation skills (Childre, Martin, & Beech, 1999) that are easy to learn, practical, self-empowering, and adaptable to multiple scenarios. The program promotes more intelligent energy, creating the ability to replace and store energy reserves in anticipation for future stressful events. As participants repeated the self-regulation building techniques, the intervention lead to a measurable shift in psychological functioning based on self-reported outcomes.

Each participant in the intervention group received educational content using the Resilience Advantage Institute of HeartMath workbook (by researcher) and *Personal Resilience Guide* (Institute of HeartMath, 2012) by the certified IHM mentors. The curriculum outlines the following educational topics: stress, resilience, and performance; energy balance using a battery metaphor describing “energy leaks;” autonomic and parasympathetic nervous system responses to stress; four dimensions of resilience; energy renewal and emotional states; and intelligent energy management. As part of the training, researchers trained participants to recognize

feeling states that generate HRV coherence using the Inner Balance biofeedback technology. To deepen the learning process, participants received one-to-one mentoring by an IHM mentor certified to teach the Resilience Advantage mentoring program.

Research questions

This study examines the ability of health care leaders to shift perceptions, attitudes, and personal reactions and actions in the face of stressful events, triggers, or challenges, ultimately building self-regulation and resilience capacity.

1. Does the introduction of HeartMath tools and emphasis on positivity affect self-regulation of leaders?
2. Does improved self-regulation lead to improved psychological resilience?

Nonrandomized selection

Quasi-experiments' purpose is to test descriptive causal hypotheses about manipulable causes, such as structural details, the presence of control groups, and pretest measures. This method support a counterfactual inference results without the absence of treatment. With quasi-experiments, random assignment is generally replaced by self-selection, referring to the units choosing treatments for themselves, or by means of administrator selection, teachers, bureaucrats, legislators, therapists, physicians, or other individuals (William, Shadish, Cook, & Campbell., 2002).

Research design

I selected an experimental design for my research to analyze pre- and post-responses from the participants in the intervention group. My purpose for this design was to

correlate differences between Time 1 and Time 2 to confirm relevance of the training on personal and organizational quality. For this reason, I selected the controlled experimental design, which is appropriate for social sciences studies. The method included a pre- and post-manual questionnaire using the POQA-R4 developed by IHM. Contextual framework combined a values-based leadership model and curriculum, taught to both groups over a nine-month timeframe.

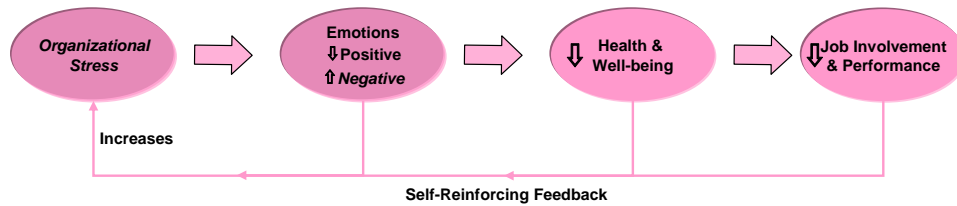
The POQA-Revised 4 Model

The POQA-R4 is a survey questionnaire developed by research scientists at the HeartMath Research Center, comprised of 52 questions that classify four major scales of workplace quality directly related to health and job performance. Barrios-Choplin and Atkinson (1996) describe the survey and outline that the instrument gathers self-reported information on socio-demographic and key psychological and workplace elements associated with overall quality and effectiveness of the individual and the organization. The instrument uses eight items of socio-demographic information about the respondents' characteristics and include gender, age, marital status, employment status, level of education, hours worked per week, number of years in the organization, and number of years in the current job (McCraty et al., 1996). Four factors measured are emotional vitality, emotional stress, organizational stress, and physical symptoms of stress and have been constructed into statistically valid and reliable scales divided into subscales.

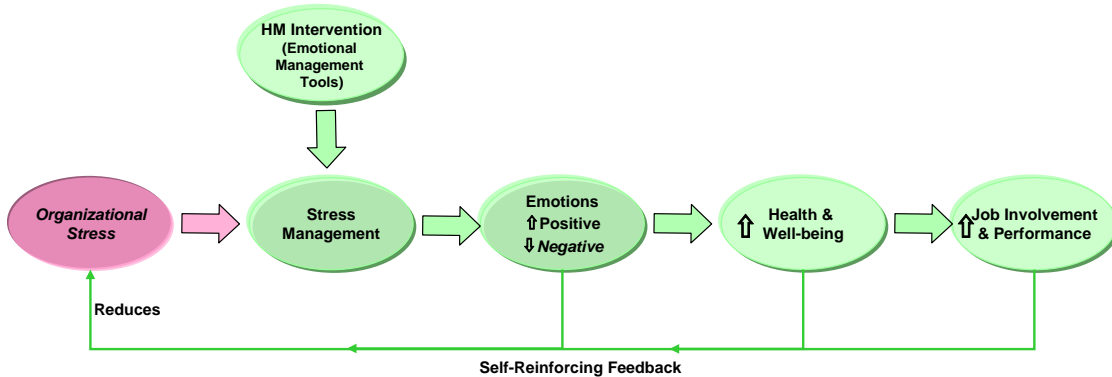
Self-Reinforcing Feedback

HeartMath interventions and a self-reinforcing feedback is designed to have a positive impact on personal and organizational stress. Figure 7 outlines the effects of organizational stress with self-reinforcing feedback and conversely, the effects of the HeartMath intervention on personal and organizational stress.

Effects of Organizational Stress



Effects of HeartMath Intervention



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Figure 7. Self-Reinforcing Feedback

The first model represents the effects of organizational stress and its impact on increased negative emotions and, at the same time, a reduction in positive emotions is noted. The combined effects of these factors have a deleterious impact on physical stress and the health and wellbeing of employees, not only increasing health care

costs and employee turnover, but it also reduces job performance and organizational effectiveness. Negative effects of stress, when not addressed, acts as a self-reinforcing cycle with a downward dysfunctional impact on both employees and the organization. The second model representing the effects of the HeartMath intervention, shows how the biofeedback-supported self-regulation and resilience building intervention mitigate the negative impacts of organizational stress and emotional stress by facilitating employee self-regulation designed to manage stress more effectively. By contrast, the introduction of HeartMath's emotional management tools, shown in the second model, improves employee ability to manage stress effectively (from sources both within and outside the organization). This facilitates an increase in positive emotions and a corresponding reduction in negative emotions, which, in turn, improves the health and wellbeing of employees. The combined effects of these positive changes reduce health care costs and employee turnover, and lead to an improvement in job performance and effectiveness. Over time, the sustained practice of effective emotional management techniques generates a self-reinforcing system of positive changes throughout the organization, which shifts the organization to an enhanced level of function and performance.

Expectation of findings

As a scholar-practitioner who experienced a personal experience using the resilience building tools, I expected the following: (a) participants would experience deep profound shifts in personal awareness, (b) relationships of the group would be enhanced, (c) they would demonstrate greater respect and appreciation for the levels

of leadership within the respective hospitals, and (d) they would self-report reduced fatigue, anxiety, stress, and feelings of helplessness with job demands. I offer a short explanation of each of these expectations.

Participants would experience deep profound shifts in personal awareness
Self-awareness of the impact of negative emotions, negative responses, attitudes, and behaviors on personal well-being. Introduces individuals to self-promoting positive reactions, behaviors, and interventions that can reverse the impact of negative emotions on well-being.

Relationships of the group would be enhanced
As members of the healthcare leadership team interact, develop relationships, and problem solve about similar issues involving each of their respective departments, increased bonding and relationships would develop.

Demonstrate greater respect and appreciation within leadership
During team-based, experiential learning, members of the team would demonstrate greater respect and appreciation for the levels of leadership within each respective hospital. Participants would gain respect for the roles and responsibilities of each member of the team and would experience the uniqueness of all participants of the healthcare team.

Verbalize improved well-being
My personal experience using HeartMath tools provided me with a history in improving in personal wellbeing. I expected the participants to verbalize a reduction in anxiety, stress, and feelings of helplessness with job demands.

Effective communication

Healthcare leaders work in collaborative environments requiring effective communication amongst team members, family members, and outside agencies. I expected significant improvements in communication due to experiential learning strategies, appreciative inquiry design, and positive leadership strategies, which were woven into the design of the curriculum.

Next, I describe how I collected the data needed to understand what went into creating improvements in personal and organizational wellbeing.

Data collection

Institutional Review Board approval

Research aspects of the study were explained in writing and verbally to all participants and consent forms were signed prior to the first leadership development session, as specified by Institutional Review Board (IRB)-approved protocol.

Prior to requesting participants to complete survey data, each chief nursing officer submitted an introductory letter to members of their team outlining upcoming leadership development research and the intervention by submission of a letter addressed to each team member (see Appendix A).

The researcher handed out the POQA-R4 assessment instrument to each intervention participant before and after the intervention. Participants were instructed to complete

the POQA-R4 by hand and include their first and last name plus last four numbers of their social security number, which was coded on the paper instrument. A previously addressed envelope to IHM was utilized to compile all instruments for each hospital.

Prior to the intervention, when a participant completed the pre-POQA-R4, the instrument was placed in an envelope and mailed to IHM. Following the completion of the training session, when a participant completed the post-POQA-R4, the instrument was also placed in an envelope and mailed to the IHM.

Training Design

Leadership development experiential learning workshops

Research design was facilitated by researcher on-site at both hospitals utilizing a leadership development curriculum emphasizing core values, positive leadership, and self-regulating techniques. All participants received didactic training modified from the values-driven leadership (VDL) competency model (see Appendix C). As previously mentioned, the initial VDL model was developed by Gus Gustafson, Ph.D., and adopted by the Center for Values Driven Leadership, Benedictine University in Lisle, IL. All participants were educated on the principals of a values-based leader using the modified competency model. Learning was strengthened using a teach-back methodology and experiential learning during five 8-hour sessions between March 2013–January 2014. Intervention groups received HRV and cardiac coherence training in a separate bio-feedback intervention training taught by the researcher during a two-day retreat consisting of a one 8-hour session followed by

one 8-hour sessions using the *Resilience Advantage Skills for Personal and Professional Effectiveness* guidebook (McCraty, Moor, & Lash, 2012). Four one-to-one mentoring and coaching sessions with each participant in the intervention group reinforced the training using Inner Balance technology. Participants used the *Personal Resilience Guide: Skills for Personal Effectiveness* (McCraty, Moor, & Lash, 2012) during these sessions.

Demographic data

The demographic data shown in Figures 8 through 14 outlines the following: years at organization, employment status, education, marital status, age range, hours worked per week, and years in current job. Final participant data for the intervention group at Yavapai Regional Medical Center, ($n = 6$). Participants' demographics: Gender: Males = 2 (33%); Females = 4 (66%); Race: Caucasian 100%.

Intervention participants for Idaho Regional Medical Center ($n = 19$) with the following demographics: Gender: Males = 7 (37%); Females = 12 (63%); Race: Caucasian 100%. Participation rate for intervention group at both hospitals was 100% for pre- and post-questionnaire completion.

Figure 8 shows number of years at current organization and suggests that most participants have been at the organization between two years or greater.

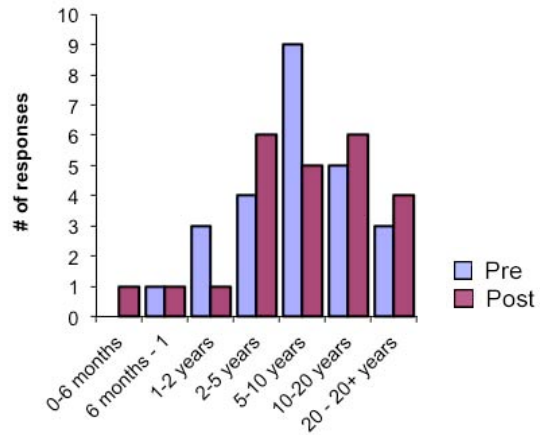


Figure 8. Years at Organization

Figure 9 shows the employment status of the participants. As noted the majority of the participants in this study were in management or professional positions with the exception of one clerical worker, a chief nursing officer and assistant chief nursing officer.

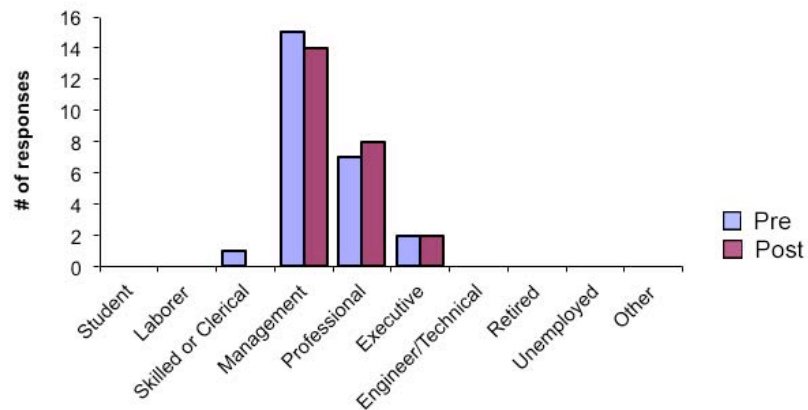


Figure 9. Employment Status

Figure 10 shows the educational level of the participants.

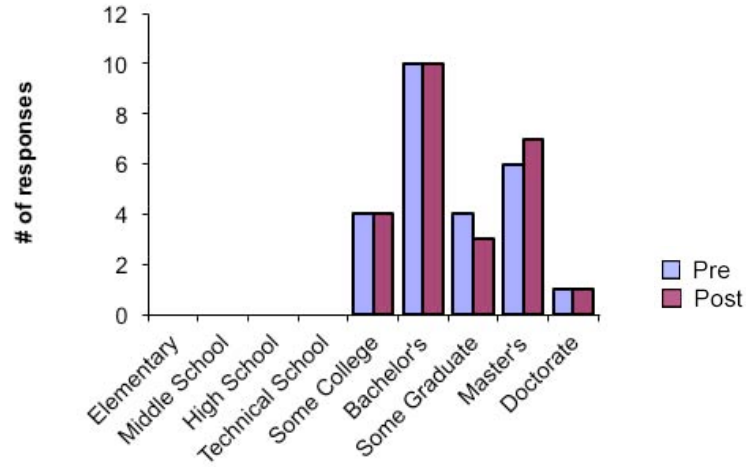


Figure 10. Education

Figure 11 shows marital status of the participants.

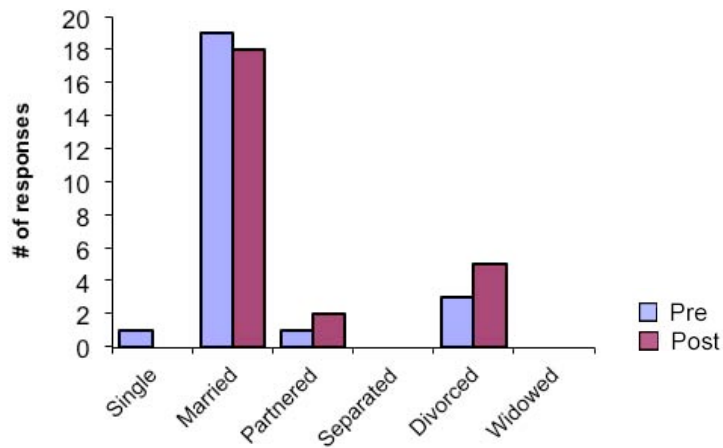


Figure 11. Marital Status

Figure 12 shows the age range of participants demonstrating that greater number of participants were between the ages of 41-50.

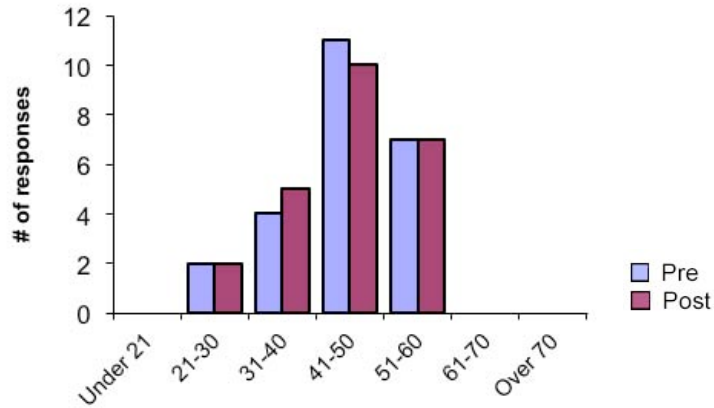


Figure 12. Age Range

Figure 13 shows worked hours per week demonstrating that most participants worked between 41 and 59 hours per week.

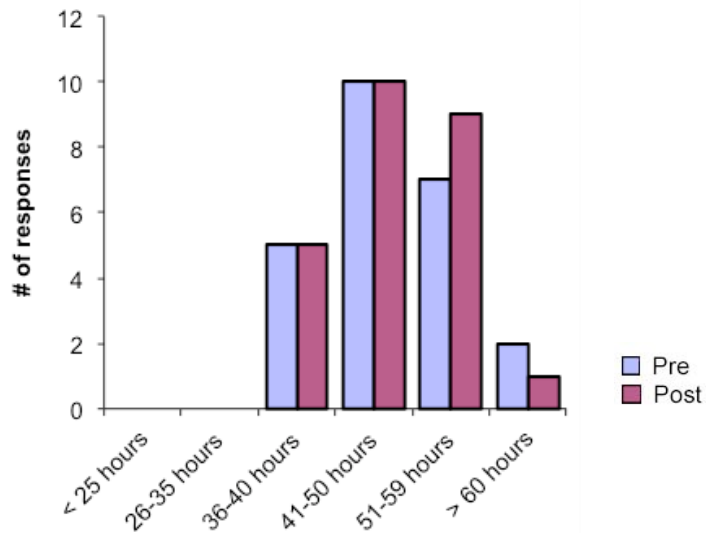


Figure 13. Hours Worked per Week

Figure 14 shows number of years worked at current job.

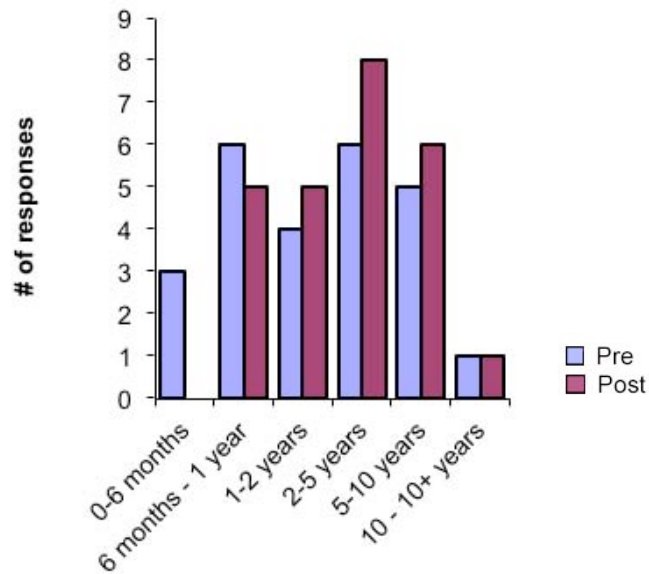


Figure 14. Years Worked at Current Job

Instructional materials

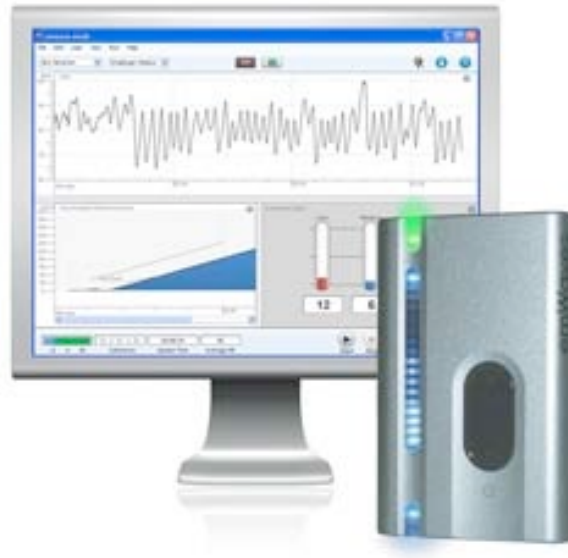
The *Resilience Advantage Skills for Personal and Professional Effectiveness* guidebook (McCraty, Moor, & Lash, 2012) was used by researchers during on-site training with intervention group. *Personal Resilience Guide: Skills for Personal Effectiveness* (McCraty, Moor, & Lash, 2012) was used during the personal resilience mentoring sessions with the certified mentors. Participants received copies of both workbooks for note taking and education during all session.

The Resilience Advantage

Prior to training intervention participants in the HeartMath self-regulatory and psychological resilience building techniques, I participated in the HeartMath

Resilience Advantage Program offered on-site at the Institute of HeartMath (IHM) in Boulder, CO. My objective was to achieve proficiency in delivering professional development to leaders in the Resilience Advantage program by attending a four-day training course to achieved certification as a Resilience Advantage and Resilient Educator Instructor.

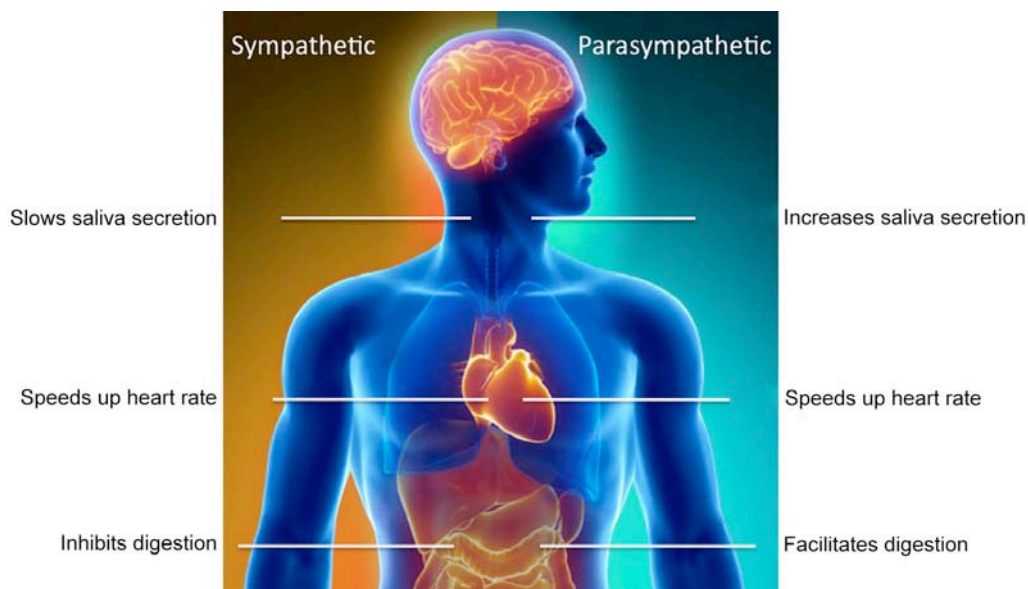
Training consisted of four pre-mentoring sessions, including a teach back session on content provided prior to the training, and an impromptu module that had to be taught by researcher with minimal planning time. Next, the researcher collaborated with HeartMath's Director of Research, Rollin McCraty, and program developer Jeff Goelitz, to design the development sessions for the leaders in the intervention group. The self-regulatory and resilience building training intervention in this study was modeled after a study conducted by Lemaire et al. (2011), consisting of a combination of rhythmic breathing, currently taught as heart-focused breathing, and the use of a self-generated positive emotion device to reinforce positive physiological change when dealing with stress or challenges. I chose to model this research after the study conducted by Lemaire et al. (2011) due to the similarity in techniques used in that study. The device utilized in the aforementioned study providing an intervention was the emWave PSR, (Personal Stress Reliever) developed by the Institute of HeartMath (Institute of Heartmath, 2013). The emWave2 detects heart rate variability and records beat-to-beat variability of the heart, providing an approach to improving individual wellness and organizational effectiveness, as shown in Figure 15.



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Figure 15. emWave2

Participants in this research study were taught the physiology of heart-brain interaction and the impact on the autonomic nervous system (ANS) including the parasympathetic and sympathetic nervous system, shown in Figure 16.



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Figure 16. Sympathetic vs. Parasympathetic Response

In addition, patients were shown the hormonal system using the Depletion to Renewal diagram within the HeartMath training workbook (McCraty, Moor, & Lash, 2012). Utilizing PowerPoint presentations in the Resilience Advantage training course, researcher reviewed physiological stress responses on ANS (see Figure 16) and hormonal system response to stress. Reception by healthcare workers to physiological responses was received with input and dialogue amongst the nursing leaders based on background knowledge of physiological systems i.e., blood pressure, respirations, and heart rate response to disease states with associated changes in waveforms. An example of how use of the inner balance biofeedback technology impacted one of the intervention participants is noted in the following quote (see Appendix D).

The Inner Balance helped me to see what was really going on in my nervous system and how it was affecting my resilience. The idea that I could activate resilience and choose where I wanted or needed to be was exciting. I could check in to see if I really was in the places I was choosing. The whole program was just great! (pp. 138-139)

Participants were trained to create cardiac coherence; a scientifically measurable state characterized by increased clarity, order and harmony in our psychological and physiological processes (McCraty, 2002). Three techniques were taught during the Resilience Advantage workshops: Heart Focused Breathing, Freeze-Frame technique, as previously outlined, and the Inner Ease Technique. Beginning with the Heart-Focused Breathing technique, participants were guided through the following steps:

- **Step 1. (Heart Focus):** Focusing attention in the area of the heart, in the center of the chest, imagine your breath is flowing in and out of your heart area reducing the intensity of the stress response.
- **Step 2. (Heart Breathing):** Take small breaths inhaling for 5 seconds and exhaling for 5 seconds.

The aim of Heart Focused breathing technique is to shift to a more coherent or optimal state during periods of stress, anxiety or a perceived emotional trigger. The Freeze-Frame technique was taught to participants and recommended to be used to aid in decision making or to maximize creativity and innovation (Childre, Martin, & Beech, 1999). Inner-Ease techniques provide in-the-moment calming, and shift of mental states allowing calmness from stressful states. Inner-Ease steps as:

1. Acknowledge your feelings
2. Heart-focused breathing
3. Drawing in the feeling of inner-ease
4. Anchor and maintain the feeling of ease

The purpose of the biofeedback technology is to assist the user to identify a positive feeling state with a visual image confirming that a physiological shift has occurred.

The inner balance technology uses a combination of waveforms and colors (red = low coherence, blue = medium coherence, green = high coherence) to provide the user with a visual pictures. As the color changes from red to blue and ultimately green, the user of the biofeedback technology is able to ascertain when they are in each coherence color. As stated by one of the participants below, overall wellbeing was promoted (see Appendix D).

I did not realize how “red” (on the Inner Balance) I was, especially at work. It helped me to acknowledge that I had to be different. There was another person in my department who also did the program (HeartMath). We would remind each other about using Ease, Heart Focused Breathing; whatever it took to get out of the left hand side (Depletion to Renewal grid). I found the more I practiced the more I wanted to do practice, because I was sleeping better, I was able to de-escalate much faster. I feel I am rolling with things better, not getting rolled over. (p. 143)

I discovered that being in red on the Inner Balance does not mean I failed. Red just is! I can do my very best to change it. When I first saw the red, I noticed that I was not practicing my program as much as I had been in the beginning. It was also one of those terrible weeks. I took the time to understand why I was in red. I took the time for self-reflection. I became more focused and I had more clarity. More green.

This HeartMath stuff is great. I am back on track! I can feel when I am in low or high coherence now without the Inner Balance. (p. 152)

Participants practiced the above techniques using the Inner Balance technology, and were asked to synchronize breathing with the pulse sensor on the Inner Balance screen, allowing the flow of respiration in and out while focusing in the area around the center of your chest. Consistent use of the HeartMath techniques utilizing the biofeedback technology, builds self-regulation strategies, Inner Balance, and a physiological coherent state (McCraty, 2005; McCraty & Tomasino, 2006).

Due to financial cost of the emWave technology, this study used the Inner Balance Technology developed by IHM. Inner Balance technology is compatible with any Apple devices, including iPads, iPods, and iPhones. Software was downloaded onto the device of choice. The Inner Balance sensor and program are shown on a smart phone in Figure 17.



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Figure 17. Inner Balance and Pulse Sensor

The intervention group attended the four-hour workshop facilitated by a researcher on-site at each hospital. All participants received the *Resilience Advantage Guidebook*, and pulse sensor and were instructed to utilize the Inner Balance performance enhancer at certain recommended intervals within their daily scheduled (8 a.m., 12 noon, and 5 p.m.). Additionally, they were asked to utilize the tools when they sensed a stress trigger or situation, which created tension, anxiety, or stress.

The Inner Balance coherence training computer software system is designed to create Inner Balance between heart and mind. The Inner Balance software provides the following sessions to aid in understanding the use of the software:

- *Training Coach* assists participants with breathing techniques and provides information about initiating a session, achieving coherence, and maintaining coherence states.
- *Review Screen* provides data about coherence data, achievement of low, middle, or high coherence, high, middle, or low coherence, training history, individualized session reports, progress summary, and achievement of goals.
- *Journal Screen* allows participants to record daily thoughts, feelings, and emotional states during training.
- *Heart Cloud* allows participants to synchronize progress with other devices, provides coaching on Quick Coherence, Heart-Focused Breathing, and Heart Feeling.
- *Help Screen* provides answers to questions and shows hints for navigation with the software.

HRV was measured using a pulse sensor, which plugged into the open port on the selected Apple device. The pulse sensor is clipped to the earlobe of the participant during the session using Inner Balance Technology. Beat-to-beat variability variation is picked up by pulse sensor and translated to a waveform and graphics visibly on the Inner Balance screen. Smooth, synchronous wavelike patterns are achieved as participants sustain electrophysiological coherence.

Upon completion of a session using the Inner Balance technology, coherence degrees are displayed in the following color presentation: (a) red = low to normal coherence; (b) blue = medium to improved coherence; (c) green = high-optimal coherence, as shown in Figure 18.



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Figure 18. Inner Balance Session Review

In summary, self-regulatory techniques and training occurred with practice using Inner Balance coherence-building software program. Following researcher introduction of the HeartMath technology, intervention participants received additional training from certified HeartMath coaches, as outlined in the following section.

One-to-one HeartMath certified mentorship support

To enhance the self-regulatory and resilience building training intervention taught by researcher, all participants within the intervention group received additional training, including four phone sessions by one of two certified mentors trained by the IHM.

During telephone conversations with the intervention group, mentors reviewed the content from the Resilience Advantage program previously taught by the researcher using the *Resilience Mentorship Guidebook* and received qualitative data referenced in the results chapter of this study. This study represents the first time that the IHM intervention research was modified using mentor support.

Personal and Organizational Quality Assessment–R4

Interpretation of scores on scales

The data for this study was systematically gathered and entered into SPSS software. The POQA-R4 survey measuring personal and organizational wellbeing (Barrios-Choplin & Atkinson, 1996) was manually scored by each intervention group participant and entered into SPSS software. Results from the POQA-R4 surveys were interpreted using statistical analysis on the instruments scales and subscales. Scores of the instrument are based on an aggregated analysis of the completed surveys. Results of this instrument provide a profile of the quality of the organizations workplace environment presented in terms of major factors enhancing or preventing leaders from producing effective work performance. Additionally, results of the POQA-R4 instrument highlight aspects of workplace environments, which may suggest opportunities for improving organizational performance.

Development of POQA-R4

A subset of 49 items from the original 81 questions from the POQA-R4 survey questionnaire were selected on the basis of a new conceptual framework composed of four major factors of workplace quality, which directly affect employee job

performance—organizational stress, emotional vitality, emotional stress, and physical stress.

As described at the outset of the results, one of the factors—emotional vitality—has a positive or enhancing effect on health, wellbeing, and performance, and the other three factors—organizational stress, emotional stress, and physical stress—all have negative or deleterious effects on employee health, wellbeing, and performance.

Normative summary

Normative summary data presents comparative data of the combined two hospitals in a broader contextual relationship comparing the data against a convenience sample of 5,971 health care workers. Distribution was rescaled to a maximum value of 100.

Results of this survey demonstrate statistically significant differences between (Time 1) and (Time 2) scoring Above Average to Substantially Above Average in the four primary scales: emotional vitality, organizational stress, emotional stress, physical stress, which will be demonstrated graphically in Chapter 4.

Primary Scales

Positive factors—enhance organizational performance

Emotional vitality scale: Positive emotional energy that enriches life experience and enhances health and wellbeing. This scale is an overall measure of the degree to which employees feel a positive emotional energy that enables an optimistic and fulfilling life experience. Low scores on this scale suggest it is likely that the

employees have low levels of emotional vitality, and, hence, may have limited emotional energy available to invest.

Negative factors—impede organizational performance

Organizational stress scale: Organizational impediments and relational discord that impair work performance, reduce job satisfaction, and increase employee turnover.

This scale is an overall measure of the degree to which employees feel negatively pressured by stressors and conflicts at work and in their personal lives that not only detract them from work performance, but may also lead them to want to quit their job. High scores on this scale signify likely stressors and tensions employees feel they are experiencing that impede work performance and may also signal an intention to quit.

Emotional stress scale: Emotional discord that reduces the quality of life experience and jeopardizes health and wellbeing. This scale is an overall measure of the degree to which employees report negative emotions, which they have difficulty controlling and which they feel impair the quality and effectiveness of their life experience. High scores on this scale indicate it is likely that the employees are feeling emotionally stressed, overwhelmed, and/or frustrated by the present circumstances of their lives.

Physical stress scale: Physical symptoms of fatigue and poor health that reflect the overall stress an employee are experiencing. This scale is an overall measure of the level of physical symptoms of stress among employees. High scores on this scale

indicate the employees may have low levels of physical and emotional energy and may also be experiencing precursors of significant health issues and problems.

Subscales

Positive factors—enhance organizational performance

Emotional Vitality scale—Consists of two components or subscales:

- *Emotional Buoyancy* subscale—Represents an employee’s feeling of emotional energy. Low scores suggest that employees may not have emotional energy to invest in work or personal lives.
- *Emotional Contentment* subscale—Represents an employee’s feelings of contentment and inner peace. Low scores suggest employees may have low levels of contentment and inner peace in all aspects of their lives.

Negative factors—impede organizational performance (subscales)

Organizational Stress scale—Consists of three components or subscales:

- *Pressures of Life* subscale—Poor scores represent feelings of being overwhelmed by the employee, they may be frustrated due to time management constraints and depleted energy levels at work and home.
- *Relational Tension* subscale—Poor scores relate to conflict with coworkers, relational disaffection which adds additional stress at the workplace.
- *Stress* subscale—Poor scores speak to competing priorities creating a feeling of being overwhelmed due to the multiple sources of stress in their lives.

The *Emotional Stress* scale—Two components or subscales:

- *Anxiety/Depression* subscale—Poor scores indicate a notable proportion of employees may be experiencing high levels of anxiety, unhappiness, sadness, and/or depression.
- *Anger/Resentment* subscale—Poor scores indicate that a notable proportion of employees may be feeling high levels of anger and resentment and experience difficulty in controlling their feelings and emotions.

The *Physical Stress* scale has three components or subscales:

- *Fatigue* subscale—Poor scores indicate that employees may be experiencing tiredness, fatigue, and physical exhaustion.
- *Health Symptoms* subscale—Poor scores indicate that employees may be experiencing physical tension, aches and pain, stomach upset, rapid heartbeats, and headaches.
- *Intention to Quit* subscale—Poor scores should be a red flag to management because they indicate an increased likelihood that a notable proportion of employees are feeling sufficiently dissatisfied with their work environment that they are thinking about leaving the organization.

Pre- and Post- t Test Results

Analysis

The results of a pre-post analysis conducted on the initial (Time 1) and repeated (Time 2) administration of the POQA-R4 survey are presented in Table 1. Raw score means and the percentage of change (Time 2 mean score minus Time 1 mean score)

are presented for both the four primary scales and the nine subscales. The direction of change from Time 1 is indicated by a positive or negative number, accordingly, to show whether the scale score value has increased or declined from the initial point of measurement. This analysis requires that each respondent completed both Time 1 and Time 2 administrations of the POQA-R4 survey, and thus has been conducted on the subset of respondents who have usable data from both time points and will be demonstrated graphically in Chapter 4.

A matched pairs t-test of the difference in means between Time 1 and Time 2 has also been computed, along with a test of the statistical significance of the mean difference. This indicates the degree to which the observed difference between the two means could be explained by chance. Observed differences in means that are statistically significant (cannot be explained by chance) are flagged in the table by one or more asterisk, signaling the level of significance. It should be noted that the smaller the sample size the more difficult it is to achieve statistical significance.

Reliability and validity

Reliability and validity, closely related concepts, are important to both quantitative and qualitative research. This section briefly describes each and explains the tactics used to address each in this study.

Validity and reliability of measurement

The psychometric integrity of the reorganization of the 49 items into these four factors was empirically verified by a validity and reliability of measurement study

conducted on the existing POQA-R4 database of 5,971 health care workers. The reorganization of items into this new framework resulted in the following range of item assignments: at the primary scale level (the four factors), the minimum number of items assigned to a factor was 8, and the maximum number of items assigned was 15; at the subscale level, (the sub-factors or components within a factor), the range of items assigned to a given subscale was from 2 to 8 items. Overall, under this new framework, 6 of the 9 multi-item subscales were measured by 5 or more items.

Two statistical analyses were conducted to verify measurement validity and reliability. In the first, the seven scales and their associated subscales were subjected to an analysis of internal consistency of measurement using Cronbach's coefficient alpha (α). Table 1 lists the number of items and alpha coefficient for each scale.

Table 1. Analysis of Internal Consistency of Measurement

	Number of Items	Internal Consistency α
Emotional Vitality	14	0.92
Emotional Buoyancy	8	0.90
Emotional Contentment	6	0.86
Organizational Stress	9	0.76
Pressures of Life	5	0.78
Relational Tension	3	0.69
Stress	1	-
Emotional Stress	15	0.92
Anxiety/Depression	7	0.90
Anger/Resentment	8	0.85
Physical Stress	10	0.87
Fatigue	4	0.87
Health Symptoms subscale	6	0.76
Intention to Quit	2	0.90

The results for the four primary scales showed that all constructs exceeded the criterion for technical adequacy ($\alpha > 0.75$): the alpha coefficients ranged from 0.76 for organizational stress, to 0.92 for emotional vitality and emotional stress. The results for the nine multi-item subscales showed that, with one exception (Relational Tension, $\alpha = 0.69$), these constructs also achieved or exceeded the criterion for technically adequate measurement reliability. Across the other eight multi-item subscales, the alpha coefficient ranged from 0.76 for health symptoms, to 0.90 for emotional buoyancy, intention to quit, and anxiety/depression.

Reliability

The 52-item POQA-R4 was empirically verified and tested with the four subscales against a database of 5,971 health care workers. Two statistical analyses were conducted to verify validity and reliability using Chronbach's coefficient alpha (α) measurement demonstrating that all constructs exceeded the criterion for technical adequacy.

Dissertation journal

In March of 2012, I began journaling all steps, contacts, and actions related to my dissertation. My intention was to have a point of reference and a system to detail all of my interactions with each executive leader at both hospital facilities, journal about the topics of discussion, goals, objections, and reflections that I experienced while on my dissertation journey.

Job aids

Supplementing my dissertation journal are additional documents used throughout my dissertation process including initial Interview and consent distributed to all participants, Appendix A: Interview and Consent Form, Appendix B: Overview of Research Modules for Leadership Development Training, Appendix C: Values-Driven Leadership Competency Model, Appendix D: Qualitative Feedback During 1:1 Mentoring Sessions, Appendix E: Program Evaluation Tool, Appendix F: Conclusion Reports, Appendix G: Leadership Legacy Tree Template.

Interviews and mentoring sessions

In addition to the dissertation journal and job aids, I included the interview comments and statements provided to the mentors during the four personal mentoring sessions. The statements are included in various sections throughout this dissertation and were documented with permission by all participants with the understanding that the statements would be published within this dissertation. My intention to include additional job aids and interview data was to increase the likelihood of another research study achieving similar results with similar conditions. (E. D. Lackey, personal journal, March, 2013).

The testimonial below demonstrates the effectiveness of the techniques on the participant as she traveled to and from work utilizing the travel time to prep, appreciate, and shift (see Appendix D).

I am not taking everything home with me. I am prepping before I go home. I don't feel exhausted at the end of the day. This has had a very positive effect on my most important relationship, my husband. He appreciates the shift. I had not connected that the ride home was my time alone to slow down, put on beautiful music. I have stopped speeding home; this was part of the exhaustion. On my way to work, I now notice the beauty of the sunrise. I am trying to slow down and see what is beautiful around me. It makes a huge difference in how I have started the day. I prep for a good attitude when I get to work, I know that there are always people waiting for me even before I can settle down, I now do that in the parking lot, it's my job, I have great people around me. I am choosing the right side. (p. 152)

Chapter 4: Results

I have been able to step back and not just rush in with an answer of a rash decision. I have found that communication at work and at home am flowing easily. I am using Prep before I go home, I visualize what is going to happen, and it does. I am excited, life has more flow; I am distributing my energy differently. I am not exhausting others and myself. —Participant in this study (see Appendix D, p. 144)

Overview

This chapter presents findings of this research. Analysis of this study represents 100% participation from the intervention group, which included 25 participants. All of the healthcare leaders in the intervention group completed the study. Research questions 1 and 2 were addressed using the Personal and Organizational Quality Assessment–Revised 4 (POQA-R4) instrument using a pre- and post-test questionnaire reflecting the indicators of self-regulation of leaders and improvement in psychological resilience.

Quantitative Results

The first and second research questions addressed in this study were addressed:

1. Does the introduction of HeartMath tools and emphasis on positivity affect self-regulation of leaders?
2. Does improved self-regulation lead to improved psychological resilience?

To establish the ability to confirm differences for the participants, this study employed a series of one-way analysis of variance (ANOVA) tests. The study variables included a pre- and post-data for (Time 1) and (Time 2) from the POQA-R4

questionnaire. Data below graphs the paired t test in the four primary scales and the nine subscales from the assessment. The raw scores shown in Table 2 are plotted using the mean (Time 1) and the percentage of change (Time 2).

Table 2. Raw Score Means of POQA-R4 survey

	Pre	Post	% Change	Significance
Organizational Stress	4.42	3.89	-12%	0.001
Pressures of Life	4.49	4.31	-4%	ns
Relational Tension	4.33	3.48	-20%	0.05
Stress	9.57	6.76	-29%	0.01
Emotional Vitality	4.75	5.58	17%	0.001
Emotional Buoyancy	4.94	5.77	17%	0.001
Emotional Contentment	4.49	5.32	18%	0.001
Emotional Stress	2.54	1.90	-25%	0.001
Anxiety & Depression	2.65	2.00	-25%	0.001
Anger & Resentment	2.44	1.82	-25%	0.001
Physical Stress	3.15	2.30	-27%	0.001
Fatigue	3.66	2.73	-25%	0.001
Health Symptoms	2.81	1.99	-29%	0.001
Intention to Quit	2.00	1.78	-11%	ns

Paired t test

Personal and Organizational Quality Assessment Revised— Four Results

Analysis

The results of a pre- and post-analysis conducted on the initial (Time 1) and repeated (Time 2) administration of the POQA-R4 survey are presented in Table 2. Results

showed significant improvements in the following areas on the primary scales: improvements in emotional vitality ($p < .001$) reductions in organizational stress ($p < .001$), emotional stress ($p < .001$), and physical stress ($p < .001$). Significant improvements were seen in emotional buoyancy (emotional energy availability for work and personal life) ($p < .001$), emotional contentment (feelings of inner peace) ($p < .001$), and reductions in anxiety and depression, anger and resentment, fatigue, and health symptoms were all significant ($p < .001$).

Results of the POQA-R4 demonstrated improvements in health symptoms (improved sleep) that were stated to have significant impact on the performance of the following intervention participant (see Appendix D).

By using all the tools and techniques I am finally getting to sleep. By getting quality sleep everything seems possible, even my job! I feel more positive, more able to cope. I feel that I was hired for a reason and that I feel that I can do this job. I have a plan of action and I believe that I will continue to use this program on a daily basis. I will use all of it. I have gotten into a rhythm of the tools throughout the day. (p. 134)

Notably, Table 2 shows that distress and relational tension were reduced by 20%, stress was reduced by 29%, emotional stress, anxiety and depression, and anger and resentment were reduced by 25%, physical stress by 27%, fatigue by 25%, and health symptoms by 29%.

Primary scales and subscales

The emotional vitality scale measures the degree to which employees feel positive emotional energy. The ability to adapt to stressful working situations and environments by storing up positive emotional energy is a key element of resilience as it can assist individuals to remain calm when faced with conflicts at work. Changes in the emotional vitality scale in this study represented increases in positive emotional energy creating enriching life experiences and enhancements in health, wellbeing, and resilience.

Participants communicated that they had a greater capacity to deal with stressful events, emergencies, and balancing competing priorities. Using the self-regulation technique allowed them to take a time-out in the moment, to reset, adapt to the situation and gain perspective on a problem or challenges, verify messages in communication, and relate with compassion and care to patients and families.

Improvements in the organizational performance have provided meaningful improvements in positive feelings, positive relations in the work environment, and job satisfaction based on comments made by participants. Additionally, participants reported reductions in feeling emotionally stressed, overwhelmed, and/or frustrated.

The primary scales data on the POQA-R4 survey is reported out in percentages based on the following ranges: Substantially above average (75%–100%), above average (50%–75%), below average (25%–50%), and finally substantially below average (0–

25%). Results from this research demonstrated post survey percentages between 50% and greater than 75% with three of the four elements showing improvements above 75%, and shown in Figure 19.

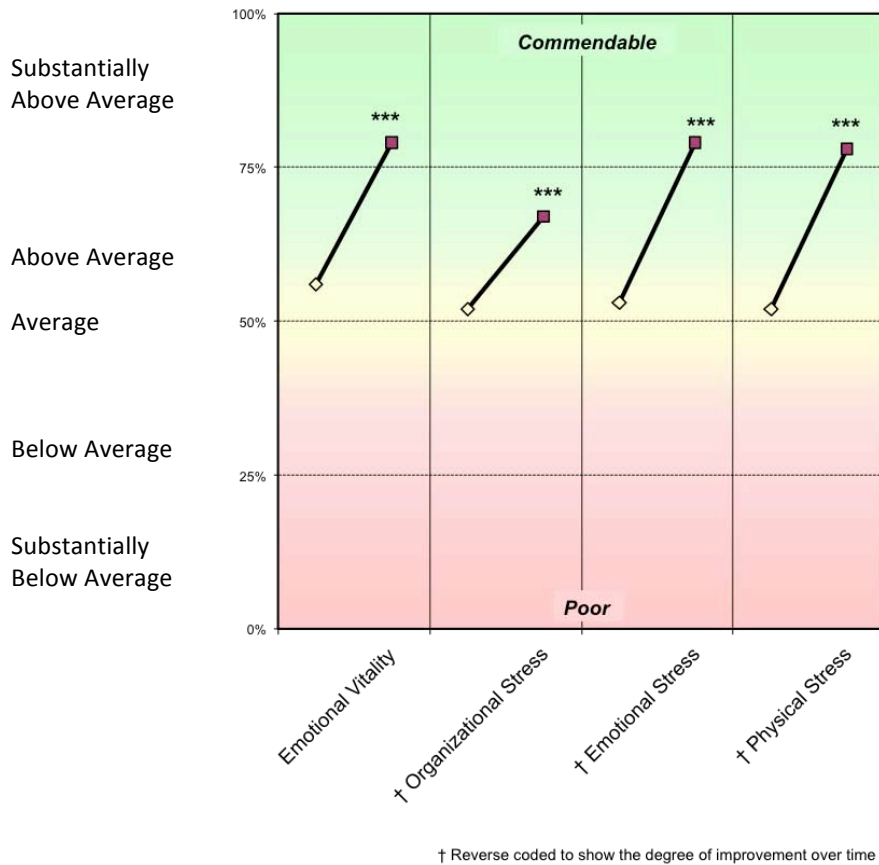


Figure 19. Primary Scales Analysis

Primary Scales Analysis

Results of the analysis of the subscales demonstrated significant results comparing Time 1 to Time 2 in nine scales, as previously indicated. Figure 20 shows a graphical presentation of the degree of improvement from Time 1 to Time 2.

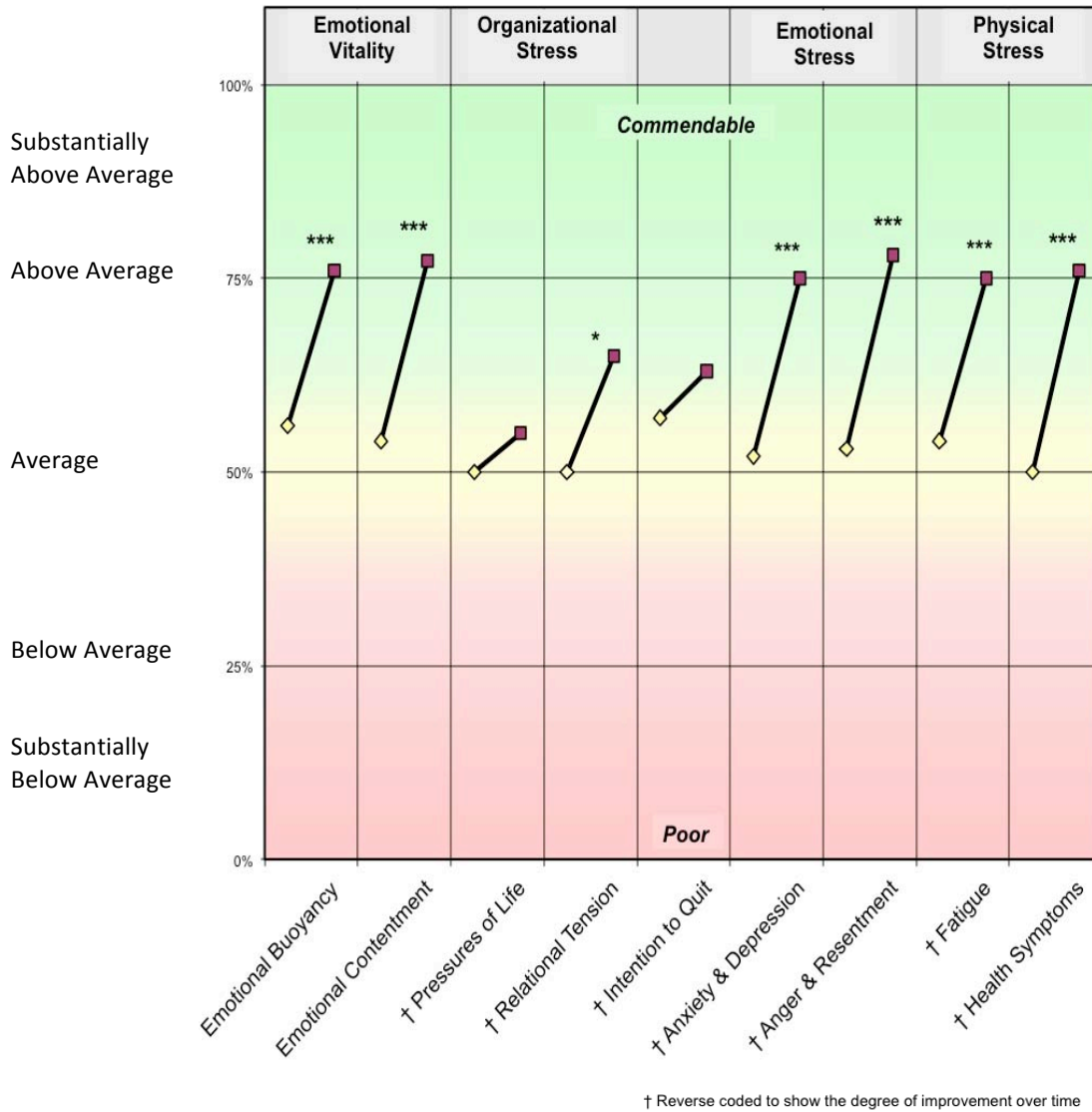


Figure 20. Subscales Analysis

Subscales Analysis

Evidence of the effectiveness of the HeartMath self-regulation and energy building intervention was clearly shown in these results. Additional evidence of the positive impact of the intervention was provided in the qualitative interview of the participants where they provided many specific examples where utilization of the tools in either

the work environment or in other social contexts created improved two-way communication, an inner balance and peace, increased positive energy, and decreased stress and feelings of fatigue. For example, when asked what he or she liked most or found the most helpful (see Appendix D), Mentee 2 stated:

I am feeling so much more hopeful for my team. I can't wait to see what happens. The only thing that has changed is me! I feel I somehow have allowed the team to have more freedom, maybe I'm more approachable, maybe I am just more at EASE, I thought I was all these things before the program... something is very different in the way the team is working together. (p. 135)

When allowed to provide comments regarding the training (see Appendix D), Mentee 2 responded:

I have been able to maintain a more positive focus. Things seem to be 80% excellent and 20% drama. It was much higher than that before this program. I have been using the Inner Balance, I like the technology, I like seeing where I am and then I can do something about it. I also found the Depletion to Renewal Grid to be very helpful, and then re-setting with Ease. (p. 135)

Another example is when allowed to provide comments regarding the training (see Appendix D), Mentee 3 responded:

When the mentor explained the science behind the Inner Balance, APP, I understood Heart Variability in a way I had never understood that before. Sounds kind of funny coming from a nurse, but this all makes so much sense to me. I started practicing with the power spectrum and looking at the heart rhythm patterns in a whole new way. With that and the practice of the tools I was able to change my perspective, and I feel excited about my job again. (p. 135)

The following testimonial provides an example of how use of the self-regulation tools reduced the physiological responses of increased heart rate and feeling flushed during an important meeting (see Appendix D):

There was a crucial meeting that I had to attend. My heart was in my throat. I told myself use “it” (the tools). I felt the flush on my face fade, and my heart quit pounding. This was perfect! I am so proud of myself, I took myself out of the picture for a couple of seconds and then I was able to come up with an option I had never thought of before. It was incredible, and my thoughtfulness made a difference in many people’s lives. (p. 137)

Several common statements emerged from the mentee comments supporting the use of Inner Ease/Balance, Heart-Focused Breathing, and Freeze-Frame stating that the tools gave them the ability to “shift” and “reset” in the moment, noting that the concepts of building resilience gave them a sense of control over their decisions and actions (see Appendix D):

Yesterday I was struggling. I said to myself use your tools. You need to stop! I did, I used Freeze-Frame with Ease as my positive feeling. The struggle was less. I was able to get to a calmer place and figure things out. By handling things in a calmer way the past few weeks, I am more approachable. (p. 144)

Additionally, on multiple occasions participants commented on insomnia, emphasizing the relationship that getting sleep had on everything else, making tasks seem achievable. Finally, several participants reported an improvement in positive feelings and positive emotions, noting that they had a choice in how they would respond to the “drama” that occurred at work. They responded that “resilience” looks

different to them know because they have an understanding of how physiology plays a vital role in being resilient. For additional information on the mentee comments, see Appendix D.

Research Questions Discussion

In reference to the research questions that I sought out to confirm, I will address each one individually. To recap, the definition of resilience used in this research study is defined by the Institute of HeartMath (The Resilience Advantage Guide): “Resilience is the capacity or ability to prepare for, recover from and adapt in the face of stress, challenge or adversity” (p. 1). Therefore, resilience is about intelligent energy management, having energy reserves after a stressful event, and refueling energy in preparation of a stressful event. Research questions 1 and 2 were confirmed based on the results of the POQA-R4. Overall, statistically significant results were documented in the primary scales in all four of the following categories: Emotional vitality, organizational stress, emotional stress and physical stress, confirming both questions in this research study. Additionally, six subscales demonstrated statistically significant results: Emotional buoyancy, emotional contentment, anxiety and depression, anger and resentment, fatigue, and health symptoms. Next, I will highlight each research question as it relates to the results.

The first research question attempted to answer the question: Does the introduction of HeartMath tools and emphasis on positivity affect self-regulation of leaders? The results of the POQA-R4 showed statistically significant improvement in emotional

vitality (wholehearted positive emotional energy), and reductions in organizational stress (organizational impediments and relational discord that impair work performance), emotional stress (emotional discord that reduces the quality of life experience and jeopardizes health and well-being), and physical stress (physical symptoms of fatigue and poor health that reflect overall stress the employee is experiencing). The results of the questionnaire, plus the numerous statements by the participants showing improved positive feelings, increased energy, self-awareness, emotional composure, and reductions in depletion support research question 1, and provide sufficient evidence that the HeartMath tools and emphasis on positivity provided healthcare leaders with tools to assist them to self-regulate emotions and shift to a positive emotional state in the face of stress and adversity.

The second research question was designed to answer the question: Does improved self-regulation lead to improved psychological resilience? Similarly, question 2 has been supported and confirmed based on the results of the POQA-R4 as stated in question 1, showed statistically significant improvement in emotional vitality (wholehearted positive emotional energy), and reductions in organizational stress (organizational impediments and relational discord that impair work performance), emotional stress (emotional discord that reduces the quality of life experience and jeopardizes health and well-being), and physical stress (physical symptoms of fatigue and poor health that reflect overall stress the employee is experiencing).

In the subscales, commendable results were demonstrated in emotional buoyance (emotional energy available for work and personal life) showing solid improvements along with emotional contentment (feeling of contentment and inner peace). Anxiety and depression (feelings of anxiety, unhappiness, sadness, and or depression) were drastically reduced, as well as anger and resentment (difficulties in emotional control), and reductions in fatigue (feelings of tiredness, fatigue, and physical exhaustion) and health symptoms (physical tension, aches, and pain, stomach upset, rapid heartbeats, and headaches) were all improved.

Self-reporting by the participants provided examples of difficult meetings, situations, and or conversations that the participants were in, and examples of how using the tools in the moment provided them with the ease and balance to demonstrate an appropriate response. Numerous examples were provided detailing how the use of the interventions helped facilitate self-awareness, allowed for an “attitude adjustment” or an appropriate action, and empowered the participants to diffuse inappropriate feelings and responses by creating a shift from a negative response prior to training with the tools, to a positive emotional shift after training, confirming that question 2 has been supported in this study.

Multiple statements by the participants referenced that the Inner Balance technology, Heart-Focused Breathing, Inner Ease, and Freeze-Frame techniques supported increase feelings of positive emotional states, resilience, energy, and inner peace. It is

my opinion that the comprehensive model combining a values-based leadership development framework with the introduction of the HeartMath intervention and the addition of the one-to-one (1:1) mentoring with participants strengthened the results of this study. The independent mentors certified trainers in use of the resilience advantage interventions communicated individually, with each participant adding explanations about the training allowing for two-way communication and questions to be answered. Participants were able to problem solve, gain a better understanding of each intervention, and experience a greater level of accountability with use of the tools.

Additionally, the qualitative data obtained from each mentee provided greater insight of the training benefits that may not have been captured on the POQA-R4 questionnaire. The qualitative data allowed each mentee to articulate in their own words the impact of the training on their personal life, staff, family, and workplace with the mentor in a private manner. The mentoring addition to this research is significant and should be considered in future research. Chapter 3 outlines the methods used during the research project with specific detail noted to provide future researchers ability to replicate this research. Chapter 4 describes the results of my research. Chapter 5 aligns my results with existing theory, and presents my theory of the impact of HeartMath intervention tools and positive leadership strategies have on self-regulation and increased psychological resilience.

Chapter 5: Discussion

I began this study seeking to understand the impact of a self-regulation and resilience building intervention and impact of positive leadership strategies on healthcare leaders. This study's findings suggest the importance of self-regulation in stress reduction, fatigue and exhaustion, increased energy, and psychological resilience. Because stress hormones released during a stress inducing response are known to suppress the function of higher brain centers, the ability for a healthcare leader to shift and reset in the moment is of great importance at the psychological level. These centers are concerned with inhibition of inappropriate responses or distractions, concentration, effective planning, decision making, morale reasoning, and other forms of rational thought (Arnsten, 1998). Learning to shift and reset in the moment of stress provides the ability of a leader to assume a state of balance and mental clarity, to respond in a responsible and non-reactive manner.

Extensive research exists supporting the relationship between cognition and emotions and confirms that they are both central and distinct functions mediated by separate but interconnecting neural systems. Neuroscience research has linked cognitive centers with emotional processing areas of the brain, as bidirectional neural connections communicating between the frontal cortex and the amygdala. These neural connections permit emotion-related input from the amygdala to modulate cortical activity and cognitive input from the cortex ultimately modulating the

amygdala's emotional information processing center (LeDoux, 1994; LeDoux, 1996; Pribram, 1975).

Over two decades of research from the Institute of HeartMath (IHM) has confirmed that quality of life, motivation for our actions, and decision making are directly related to our emotions, underlying the majority of the stress we experience. The heart is the most powerful energy source in the body, generating rhythmic information patterns that consistently communicate with the brain and other body systems through multiple pathways: neurologically (through the autonomic nervous system (ANS), biochemically (through hormones), biophysically (through pressure and sound waves), and energetically (through electromagnetic field interactions). The heart uses its energetic power to coordinate the body's oscillators and synchronizes the system as a whole (McCraty et al., 2009; McCraty & Childre, 2010). The extensive studies in the laboratory of IHM have demonstrated that heart rate variability patterns are consistently the most dynamic and reflective changes in the emotional states of humans (McCraty et al, 1995).

This state of biological coherence is referred to as cross-coherence and occurs in physiology when one or more of the body's oscillatory systems become entrained and begin operating at the same frequency as in respiration and heart rhythms (McCraty & Childre, 2010). Cross-coherence between the heart and brain create psychological coherence, promoting cortical facilitation (McCraty, et al., 1995; Tiller, McCraty, &

Atkinson, 1996), resulting in more coherent modes of cardiac function, improved heart rate variability (HRV) patterns, and improved cognition and mental clarity using the HeartMath intervention Freeze-Frame. This study aimed to address healthcare leaders' ability to self-regulate during periods of high stress anxiety. The study's findings are encouraging as the results of the Resilience Advantage program enabled the majority to recalibrate more quickly and deeply to a state of increased psychological balance in the moment.

Results of the POQA-R4 demonstrated the following statistically significant improvements: increased awareness and self-management of stress reactions; reduced distress, anger, sadness, and fatigue; reduced sleeplessness and physical stress symptoms; increased peacefulness and vitality; reduced competition; improved communication; and greater cooperation within work teams; improved work performance; greater positive emotional energy, balance, and clarity under stress; and improved listening and relationships with peers and family. These findings support the relationship between heart-brain interactions improving self-regulation, cognition, mental clarity, and renewed energy reserves. The results represent the participants' ability to make a choice in their decision-making relating to intelligent energy management (see Appendix D).

This program has given me the opportunity for self-reflection. I have become more aware of where I am on the Depletion to Renewal grid, and then I can do something about it if I am on the left hand side of the grid. I have been noticing more of what is around me, not just about

me, but everything around me. I am feeling pretty good about everything. (p. 145)

One of the most profound effects of the integration of the self-regulated skills among the trained healthcare leaders was a self-reported improvement in listening and communication. This result is encouraging, as errors in communication among healthcare leaders are a significant factor in safe delivery of care, near miss, and sentinel events. As researcher and practitioner, I must point out that during the values-driven leadership (VDL) competency model, the Relationship Builder element stresses “high-impact communication,” including training on effective listening skills. Participants within the intervention group received this training as part of the leadership development program, which may have influenced the results.

One of the most significant findings of the research of the self-regulatory intervention was seen in the participants’ increased emotional energy available for work and personal life, which is a fundamental key in resilience. This is of particular significance, as research on human stress and resilience has clearly shown that it is our internal mental and emotional reactions to external situations as events that are the most fundamental source of the “stress” we experience (McCarty, & Atkinson, 2012). In this study, providing healthcare workers with practical, easy-to-use tools allowed them to better recognize and eliminate stress responses in the moment, significantly increasing participants’ awareness of their stress, as well as their

confidence in their own ability to manage stress reactions effectively (see Appendix D).

When I signed up I had no idea how great this program was going to be. It really is transforming! Everything just flowed this week. My five senses have all peaked. I feel more alert, more aware of everything around me. I feel like my intuition is right on. I trust what I am sensing! (p. 142)

Outcome research data suggested that self-regulation techniques reduced the stress healthcare leaders felt in their personal and work lives, helping achieve deeper levels of internal balance during and after acutely stressful situations. It is imperative to note that regardless of the effectiveness of the tools and technology, the potential to increase resilience and performance and reduce symptoms of operational stress can only be realized and sustained with continued, regular use. Practice and repetition is key in creating automatic responses to challenging situations and can be facilitated with ongoing use of the skills and by receiving support from a leader/mentor. This research included four personal mentoring sessions to provide the leader with necessary knowledge and tactics to assist in sustaining and expanding the use of the self-regulation and energy management skills effectively. The ability to receive coaching and mentoring from a trained expert in the self-regulatory interventions provides the critically needed accountability, educational support, and two-way communication to continue building psychological resilience. I encourage future researchers studying the impact of the HeartMath tools on participant groups to strongly consider using a mentor-facilitated addition to their research design to

deepen the understanding of the science, provide two-way, one-to-one communication, and encourage use of tools as outlined in the program design.

Conclusions

Healthcare leaders as an occupational group experience high levels of stress. The cumulative impact of physiological, psychological, and behavioral wear and tear of stress in the caring environment contributes to fatigue, burnout, and errors in care delivery. These consequences can severely impact personal health, effective communication, patient safety, and turnover and absenteeism. Organizational impact of these consequences has profound impact on legal issues and financial operating margin.

Results of this study provide convincing evidence that the application of practical stress and emotional self-regulation skills can reduce damaging psychological responses to the health and wellbeing of healthcare workers. Healthcare leaders reported marked reductions in negative emotions, fatigue, and physical stress symptoms as well as increased peacefulness, physical vitality, and improved work performance. Significant improvements occurred in communication and relationships at home and at work. Results suggested that participants were empowered to choose a reaction, either positive or negative, in response to stress-producing events.

Long-term sustainability of the program requires additional research. The results of the initial investigation suggest that continued use of the interventions could support

gaining increased levels of emotional self-regulation that could have strong implications on organizational outcomes and performance.

Limitations

Several limitations are worth noting relating to this research and will be addressed individually.

Training context for this study occurred within a VDL framework model and may have influenced the improvements in communication as outlined in the element Leader as Relationship Builder. The framework outlines five elements of a values-driven leader and include leader as authentic self, leader as teacher and learner, leader as relationship builder, leader as strategic visionary, and leader as results driver. Training modules were developed by researcher using the VDL framework and modified for each healthcare setting by aligning each hospital's unique mission, vision, and behavioral statements. The Leader as Authentic Self element supports, authenticity and self-reflection as a key factor in leading with values and integrity. During the leadership development training, self-reflection was emphasized at the beginning of each training session using a check-in method allowing for all participants to reflect on previous training sessions and reflect on the learnings from that particular module. Emphasis on reflection may have had a slight impact on the outcomes of the results. Further research is required to determine if the significant impact of this research was influenced by the additional training from the VDL framework and competency model curriculum.

Two certified independent mentors provided group participants training in the HeartMath intervention during four personal mentoring sessions. This study represents the first research program encompassing this addition to the program design. The purpose of the coaching sessions were to extend upon the didactic portion of the workshops as taught by the researcher, enhance the learning of the participants, and encourage utilization of the techniques at the appropriate frequencies during the day. Further research determining the impact of the certified mentors could shed light on the impact on future research. Duplication of this design, which included a remote educational intervention in addition to the didactic and experiential sessions taught by researcher, could confirm the ability to recreate similar results in a future study.

Diversity (or lack of) may or may not be a factor in this research, as all participants in the research were of Caucasian ethnicity. A similar research design with a more homogeneous ethnicity could provide evidence of factors impacting diversity.

Urban vs. rural differences may be a factor as both hospital settings are located in rural communities without urban influences. Questions relating to Intention to Quit may yield different responses in communities with greater healthcare facilities.

Limitations related to the POQA-R4 are also noted and should be considered when applying this research. Data noted on the instrument are self-reports from survey participants and may or may not truly reflect the respondents' behavior, attitudes, or feelings. Data collection has not employed random sampling methods; therefore, the degree to which the results can be accurately generalized beyond the study population unknown. The analysis is based on an aggregation of the data for the whole study population; therefore, the results may not accurately characterize the attitudes, feelings, or behavior of any subpopulation or individual.

Many other unmeasured variables are not included in the POQA-R4 assessment, which may or may not have had an effect on the results observed. The results must be interpreted with appropriate caution.

All of the aforementioned variables should be considered when interpreting the results of this research to determine if modifications to the variables would have an impact on the outcome in other settings. To clearly understand the significance of the study, each variable previously mentioned should be eliminated and studied independently to evaluate duplication of the results.

Implications for Future Research

Results from this research study demonstrated significant shifts in stress reduction, emotional buoyancy and contentment, anxiety and depression and health symptoms. Sustainability of results will depend on continued practice using the skills to deepen

outcomes and improved sleep states. The testimonial below outlines the multiple aspects that this research benefited their daily situations (see Appendix D).

In terms of leadership, I am looking at the situations, stepping back doing a Freeze-Frame and I am reacting more positively. At home, I am doing much better. I know what my kids and husband do that trigger me. Things are great at home. I know what I can do, I recognize where I am and I can choose to change it. I practice before I go home with prep and I have been using Freeze-Frame at home. I like the way I feel. Since this program started I had some very challenging situations. I was very emotional and it was not appropriate at the time to talk about it at work. This program came at a perfect time so that I could learn to handle my emotions and be less reactive. I am also getting much needed sleep. I am waking up feeling refreshed! That has been a huge benefit to me. (p. 151)

Future research related to this study could provide additional information about the effectiveness of the HeartMath tools in combination with a leadership development program. The following is a list of recommendations for future research.

Sustainability of results at both healthcare facilities and would be of interest to determine the long-term effectiveness of the HeartMath tools. A longitudinal study of the intervention participants at six months post-research could determine the compliance of the intervention group, self-report of personal quality and organizational outcomes. As previously stated, on-going use of the tools will support continued psychological resilience of the participants.

Organizational impact could be researched to determine if large group participants trained in the self-regulation and resilience-building techniques had an influence on cultural and behavioral influencers impacting patient satisfaction, clinical quality, and organizational performance.

Transformational leadership's relationship to high-performing healthcare organizations, primarily magnet hospitals, is receiving a great deal of attention. A correlational study between psychological resilience and transformational leadership could be of importance to determine if a relationship exists between high levels of psychological resilience and transformational leadership behaviors.

Leadership influences related to energetics and electromagnetic transfer of positive emotions could be studied to see if increased psychological resilience by unit or department leaders translates to social coherence and high-group coherent interactions within healthcare organizations. A correlation between leader and follower as it relates to energetics could provide significant information and implications for leadership within organizations.

Resilience at work as discussed by Caza and Milton (2011) refer to the behavioral, affective, and psychological manifestations of positive adaptation and professional growth (p. 896). The authors further surmise that a positive developmental trajectory is characterized by demonstrated competence in the face of, and professional growth

after, experiences of adversity in the workplace (pp. 895-896). Research studying the competence of healthcare workers in relationship to improved psychological resilience may provide information related to clinical competency and performance in the face of stress, as compared to individuals trained in the HeartMath interventions. A correlation between improved psychological resilience and improved clinical competency could demonstrate a significant reduction in errors of communication, errors in medication administration and sentinel events.

Coding of qualitative data. During the one-to-one mentoring with certified independent coaches, qualitative information was recorded reflecting feelings, emotions, and individual reflections regarding the training. Themes relating to benefits of the program emerged. Many participants discussed reductions in anxiety, improved sleep states, and relational improvements both at home and at work. Qualitative coding of this information may provide themes or processes that may have influenced the results of this research.

As a researcher, I have attempted to outline the process and implementation of this study for future researchers. It is my hope that emphasis will be placed on the personal health and wellbeing of healthcare leaders for decades to come to support the care and compassion that we desire to give to the patients that we serve (see Appendix D).

I have seen what a difference it can make to the people around me at work and at home, when I step back and become more thoughtful about my reactions and what I say. The people around me seem to be reacting in a more thoughtful way also. I am using this program on a daily basis. I am using the Inner Balance at least twice a day. In the past four weeks I have noticed that I feel more energized, more intuitive, and aware. This program is a functional, usable way to keep one rejuvenated. I expect more things will unfold in my life as I make this program second nature. I am putting out the feeling of ease and positivity and I do not have the things coming at me like the person who held this job before me. (p. 153)

Appendix A: Interview Consent Form

Study Title

Clinical Excellence and Organizational Performance Utilizing a Leadership Development Program of the Emotional Contagion Agenda

Background and Purpose

I am a student at Benedictine University in Lisle, Illinois engaging in research related to my dissertation project. In addition, I am also a Clinical Account Executive in a healthcare leadership solutions company in Columbus, Ohio. You are being asked to take part in a research project the purposes of which is to help create understanding of the perspectives of effective leadership development elements that result in strong unit and organizational performance. Additionally, your participation will provide information regarding the impact of uncontrolled stressors faced by nursing leaders on the front-line, when the stressors are not effectively managed or coping mechanisms are not initiated.

Procedures

This research will utilize a combination of research instruments. An on-line survey will be conducted to determine your style of transformational leadership and will take approximately 45 minutes to complete. You will be asked to take a pre and post on-line survey. Additionally, you will be asked to participate in an interview between you and me. The interview should last approximately 60 minutes. I will lead the interview but this interview should reflect your desired discussions regarding nursing leadership. With your permission, I will record the conversation using a digital voice recorder so that I may later accurately transcribe our conversation. Finally, you may be asked to be trained in the use of an emotional management intervention that you would be asked to use 3 times per day during your daily operations on the unit. You would be provided with a piece of technology that would measure your ability to manage your emotions.

Confidentiality and Risk

It is my intention to publish my dissertation research upon completion. Please know that you do not have to discuss any topics or answer any questions that would cause risk to you or your organization. In addition, you may ask that I use a pseudonym in preparing the research document to protect the identity of your organization and you. If you make this request, your organization and you will only be identified by pseudonym in the published research document. Provision will be made for the safe and secure storage of all research data, including recordings, for a minimum of 6 years.

Signature

I confirm that the research purposes, procedures, and matters of confidentiality and risk have been explained to the participant. All questions have been answered. The participant has agreed to participate in this study and understands that the interview will be recorded.

 E. Denise Lackey (interviewer)

 Date

 Participant (interview)

 Date
Contact Information**Researcher**

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Appendix B: Overview of Leadership Development Research Modules

Module 1—Healthcare Leader Excellence and Operational Outcomes

Leadership Development Retreat

Maximization of Healthcare Excellence and Operational Outcomes of Leadership Development

Ice Breaker: Positive Practices Instrument (Positive Leadership Assessment)

Day 1 Am Session

“Impact of 5”

Post-It Note exercise

Compassion and Anger’s impact on personal well being

Welcome—Day 1 Am Session

Overview of retreat

Benefits of Positive Leadership

Introductions:

Why did you choose healthcare as a career

Personal assessment (group discussions)

What is Values-Driven Leadership?

Introductions

Benefits of Values-Driven Leadership

5-Element VDL Model Power Point Overview

Values-Driven Leadership Model:

VDL 5-element Leadership Model open discussion

VDL in practice, personal examples

Testimonials

Personal Impact

Introduction to Positive Leadership/Transformational Leadership—Overview

Cultivating positive climate

Positive relationships

Positive energy

Positive communication

Positive meaning

Presentations to class assignments handed out:

Group 1: Leader as Authentic Self

Group 2: Leader as Teacher & Learner

Group 3: Leaders as Relationships Builder

Group 4: Leader as Strategic & Visionary

Group 5: Leader as Results Driver

Break for Lunch

PM Session

Presentations (Groups 1-5)

Positive Practices (Breakout Session Discussions)

Positive Leadership Practices Assessment (review and discussion)

Implementing Positive Leadership Practices

Required follow-up activities:

Friday morning or afternoon:

Email stepoffaithtransformationalleadership@hotmail.com

Discuss “gratitude” moment that involved you & another employee (Word, sentence, and overview of the event. What positive feeling was generated)?

Create an outlook invite appointment: Subject “gratitude email to Denise”

Identify top talent amongst your team (no mentoring or coaching of this individual, only make a mental note of who your top performers are. What leadership do you see in them and why?)

Exercise communication: 5/6 positive statements to 1 negative statement

Managing up: 5 verbal IM’s (Inspirational Messages) to co-workers

Evaluations completed

Module 2—Leadership Development/Putting Values to Practice

Am Session:

Overview of Module 1:

Legacy Theme

Check-In:

-How have you used the LD information to date?

-What will your personal legacy be?

Putting Values to Practice (Align organizational mission behaviors with 5-Element VDL Model)

Presentations: (class presentation preparation of organizational alignment of mission behaviors)

Group 1:

Group 2:

Group 3:

Group 4:

Group 5:

PM Legacy

Presentations: Groups 1–5

Values-Driven Leadership Model:

Recap of VDL 5-elements

VDL in practice personal examples

Testimonials:

Personal impact

Group impact

Family impact

Values in Action:

Legacy discussions:

Legacy Tree—(personal development)

Evaluations completed

Module 3—Leadership Development/Team Action Planning

AM Session:

Action Planning: Values-Driven Leadership/Positive Practices Behaviors

Create an action item for each of the following: (using VDL Model Handout)

Leader as Authentic Self
 Leader as Teacher & Learner
 Leader as Relationship Builder
 Leader as Results Driver
 Leader as Visionary & Strategist

Personal Actions: (AS—Accountability, TL—Demonstrates Values & Integrity, TL—People Selection & Development)

What behavior will you demonstrate to support the mission values of your org?
 Who will be your accountable partner (check-in with)?
 What is the measurable outcome you will use to confirm success for each item?

PM: Operational Excellence & Strategy

Alignment Models: 7-S Strategy
 Group presentations: aligning 7-S strategy to practice
 Identify a challenging situation at your organization
 Utilize 7-S Strategy to discuss & identify solutions
 Present strategy to group

Module 3B—Leadership Development: The Resilience Advantage

PM: Intervention Group Only Prep for HeartMath Session

Pre-Instructions provided for Intervention group

Inner Balance Technology—(download prior to class)

Download App

- go to app store on your iPhone/iPad/iPod
- On the bottom right, insert HeartMath into the search space
- The Inner Balance page should come up. Download the free app

POQA-R—(complete 80-question test)

--Last 4 SS

--Name

Each participant send a personal introductory email specified IHM Mentor

HeartMath Resilience Advantage Program

Day 2—Intervention Group Only

Overview of The Resilience Advance PowerPoint

Optimal Performance

Dimensions of Resilience

Physiology of Resilience

Depletion to Renewal

Coherent Decision-Making

Introduction of technologies:

Heart-Focused Breathing

Inner Ease

Freeze-Frame

Practice time with Inner Balance

Module 4—Leadership Development/Accomplishments, Acknowledgement, Recognition

AM: We Did It!

All participants required to go to flip chart in front of room and write down accomplishment for 2013

After all members of leadership identified accomplishments, individual presentations by facilitators of each accomplishments

Module 5—Leadership Development/Wrapping It Up

Recap of training:

5-ElementVDL Model

Positive Practices Strategies

Round table discussions about pre/post feelings of training

Putting Practices to Work:

Action planning (group objectives identified)

1 week, 30 days, 90 days

Post assessments:

POQA-R completed in-class

Appendix C: Values-Driven Leadership Competency Model

Participants were handed a packet of information outlining the VDL competency model and given an overview by researcher utilizing power point presentations. Definition of a values driven leader and each element of the model was introduced and outlined as follows:

Values-Driven Leadership: invites both leaders and employees to go beyond self-interest and embrace a synergistic vision of high personal and organizational performance and contribution. This approach to leadership suggests a transformational process that has the potential to create positive change in both the individual and organization.

Values-Driven Leaders: set forth the highest of standards-based on integrity, accountability, and values, which create the foundation upon which successful organizations can build both people results and business results. Leadership is the ability to influence and inspire an individual or group to demonstrate behaviors that achieve the deliverables outlined and are sustainable in the absence of the leader. (Center for Values-Driven Leadership; 2011-2013)

Values-Driven Leadership Competency Model

The VDL model suggests 5-elements are critical for leaders to model values-based behaviors designed to create transformational organizations. Leader as Authentic Self became the element emphasized to support insertion of the bio-feedback supported self-regulation and resilience building intervention. Each model element will be outlined below as presented by the Center For Values-Driven Leadership:

Leader as Authentic Self

VDL first and foremost recognizes that leadership starts and ends with the individual. The idea of self-reflection is central to the way in which a leader gains new insights and key learnings, thus allowing for positive change and growth to take place from within. This self-modeling becomes most fulfilled when the employees themselves become leaders who exemplify the principles of VDL.

Leader as Teacher and Learner

Values-Driven Organizations invite individuals as leaders to teach employees both by informing them and by bringing out the best in what each person has to offer. A leader is both a world-class teacher and a world-class learner who authentically models the values of the individual and the organization. They embrace the teaching-learning model as a way-of-life that becomes a lifelong journey.

Leader as Relationship Builder

Relationship building is a foundational component to VDL. Values-Driven Leaders unconsciously recognize and demonstrate that a significant investment in interaction with others helps to build trust and a sense of “team-as-community” so that creativity and commitment can be maximized. Leaders are empathetic listeners who truly value what others have to say.

Leader as Results Driver

Effective VDLs are relentlessly focused on their personal and organizational vision and are consequently high performers and significant drivers of results. They are true stewards of the business they are involved with and are equally as concerned with the process of how the results are achieved, as in the results themselves. VDL’s recognize and understand that in order for success to be sustainable over time, they need to continually raise the bar while coaching and developing employees for personal and professional growth.

Leader as Visionary & Strategist

Two of the key characteristics inherent to VDL are foresight and conceptualization. Conceptual skills allow them to see the big picture-the “where we want to go”-while foresight enables them to map out how we are going to get there by anticipating the various consequences of the individual and collective actions of the organization, and then picking the actions that will best serve all of the stakeholders.

(Center for Values-Driven Leadership; 2011-2013)

Additional information as provided by the VDL model was introduced during the initial session outlining subcategories and associated behaviors required to demonstrate values-based leadership. In addition to the element sub-topics outlined in the original VDL model, the researcher made minor modifications to the model to tailor it to healthcare. The following descriptions outline subtopics outlined during initial training:

Leader as Authentic Self

Leadership Accountability:

Demonstrates or models the values and behaviors of the Dynamic Organization
 Holds others accountable for demonstrating the values and behaviors of the Dynamic Organization
 Creates an environment that motivates and inspires others
 Creates an environment that respects others
 Takes full responsibility for the performance of his/her organization
 Ensures that others have the tools and resources necessary to do their jobs

Self-Development:

Assesses personal strengths and development areas
 Seeks input on personal performance and opportunities for improvement

Is receptive to feedback from others
 Drives developmental action planning by accepting/responsibility for personal development
 Takes full advantage of opportunities that enable personal development

Versatility:

Makes effective decisions during stressful situations
 Remains productive during stressful situations
 Demonstrates a positive, proactive attitude towards change
 Responds effectively to new information, situations and individuals

Leader as Teacher and Learner:

Demonstrating Values & Integrity:

Teaches the values and behaviors of the Dynamic Organization
 Solicits input and ideas from others
 Shares information with others
 Respects the contribution of others
 Follow-through on promises and commitments
 Acknowledges when a mistake or misjudgment has been made and works to correct it

Coaching & Mentoring:

Orient, train and set expectations for new employees to create an environment that is conducive to learning and fosters their success
 Identify others strengths and development needs in order to coach effectively (performance to expectations)
 Provide timely and ongoing coaching, guidance, and feedback to help others improve and grow
 Provide developmental opportunities and assignments to employees in order to stretch their capabilities and potential for contribution
 Prepare effective development plans that are specific, practical and address current and future needs
 Show an interest in employees careers and provide information and opportunities for advancement

People Selection & Development:

Ensures the best people are in the rights jobs
 Employs effective retention practices to improve business performance
 Sets clear expectations and inspects on them
 Hold associates accountable for meeting performance expectations
 Sets challenging, yet achievable goals
 Assesses strengths and development areas of others
 Encourages, supports and facilitates the growth and development of others

Leader as Relationship Builder:

Interpersonal Skill:

- Establishes rapport and builds trust with others
- Seeks/leverages different perspectives to enhance team collaboration, customer responsiveness, and productivity
- Interacts positively with differing styles and personalities
- Uses appropriate language, humor, and gestures
- Demonstrates tact and diplomacy when confronted with contentious or politically sensitive situations
- Demonstrates empathy by considering the feelings and concerns of others
- Demonstrates sensitivity to individuals' specific circumstances before making judgments or taking actions

High Impact Communicator:

- Actively listens to learn
- Facilitates understanding by asking probing questions
- Speaks persuasively to influence and energize others
- Expresses ideas and information clearly and concisely
- Paraphrases and summarizes main points to confirm understanding before drawing conclusions
- Adjusts personal communication style by monitoring and responding to verbal and nonverbal cues

Team Approach:

- Takes clear steps to build and maintain strong, positive working relationships with others
- Actively participates and pitches in to help the team grow and develop
- Champions teamwork by reinforcing cooperation within the team
- Builds positive energy and attitude in the group
- Accepts and supports team decisions once they are made

Leader as Results Driver:

Social Responsibility:

- Providing leadership so that everyone in business is aware of social and environmental impacts in their day-do-day activities
- Developing collaboration (partnerships) between business and community
- Seeking alternatives to business practices that are harmful to the environment
- Encouraging responsible use of resources to be more responsive to resource conservation
- Supporting efforts to improve stewardship at the individual, team and organizational levels
- Understanding and addressing current and future workforce issues to improve quality of life and build sustainable organizations

Organizing and Planning:

Plans activities according to strategic priorities

Establishes plans that have clear action steps, milestones and timeframes for completion

Verifies that plans are progressing on schedule

Plans for contingencies by anticipating changes and their impact on plans and processes

Decision Strength—Business & People:

Considers the impact decisions, plans and initiatives have on the associates, the customer and the company

Critically analyzes problem areas

Recognizes when to obtain the input of others before making decisions

Demonstrates a clear grasp of key performance indicators

Identifies trends and implications in data

*Leader as Visionary & Strategist:**Shaping and Executing Strategy:*

Identifies critical goals and success factors for achieving these goals

Develops innovative approaches to executing and achieving business goals

Aligns (focuses) organization efforts and allocates key resources to according to strategic priorities

Develops contingency plans to deal with possible obstacles to executing and achieving business goals

Customer Focus:

Demonstrates passion and excitement for serving customers

Challenges others to think like a customer

Takes ownership for solving customer problems

Seeks feedback from customers

Places customer issues as highest priority

Takes action to remove barriers and obstacles to achieving customer satisfaction

Leading Change:

Continuously seeking opportunities for different and innovative approaches to address organizational problems or opportunities

Acts as a catalyst for change and stimulates others to change (think and act different)

Paves the way for change—removes barriers, obstacles and/or resistance so that change can be managed effectively

Is adept at gaining commitment of key individuals to ensure successful change implementation

Understands change management methodology—i.e. preparing for, executing and sustaining change

Understands the human dynamics of change to help others internalize and come to terms with new situations

Appendix D: Qualitative Feedback During 1:1 Mentoring

Qualitative Feedback of Participants Reported by HeartMath Mentors
Yavapai Regional Medical Center and Idaho Summary Report
Submitted January 21, 2014

Project Lead Mentor

Resilience Advantage Training

Following the training, each participant had four 1-hour telephone sessions with a Certified Personal Resilience Mentor. Overall, this group was highly engaged in the mentoring sessions and gave both the mentoring and the training high marks.

All leaders completed the following:

The Resilience Advantage 4 hour training conducted by trainer Denise Lackey and used the Guidebook;

Pre-POQA-R instrument;

Downloaded and were introduced to the Inner Balance technology;

Each participant reached out to his/her Mentor with a test email to confirm the connection electronically.

All leaders were given the following instructions:

Given a personal copy of the Personal Resilience Mentoring Guide for using during their individual mentoring sessions;

Were provided an overview of the mentoring using The Resilience Training Flyer that was reviewed in class, acknowledging that 4-sessions (via conference call) would occur with an experienced HeartMath Mentor;

Asked to use the Inner Balance at the following times: Early AM; Noon, 5 pm & bedtime. The trainer also requested that they use the technology when anticipating or experiencing challenging or stressful moments throughout their day and when they have difficult decisions to make. The trainer stressed that their Mentor may recommend a modified sequence of times for the technology to be used and should follow the Mentor's lead;

All of the participants are aware that the Mentors would be contacting them individually to set up four mentoring sessions (50 minutes each) to deepen the learning and support them with utilizing the technology at the appropriate times on a daily basis.

There were some scheduling issues that included heavy workload, last minute schedule changes and personal situations. All participants attended all four of their mentoring sessions with one individual given an extra one at the mentor's discretion.

Personal Resilience Mentoring

There are several unique aspects of the mentoring program approach:

The program has significant potential to reduce a wide range of stress related symptoms such as overwhelm, fatigue, sleep issues, emotional drama and the incidence of more serious conditions;

The delivery mechanism is easily replicable and scalable, up or down;

The delivery approach eliminated concerns related to stigmatization;

The program was home-based so travel was not required and phone appointments and the mentor accommodated the schedules of the participants;

The approach has been proven to be cost-effective and to lower health care costs.

The mentor focused on understanding the unique and specific challenges of each participant and encouraged each to utilize appropriate self-regulation and coherence-building skills to build and sustain their own health and resilience.

Participants found the initial training helpful in setting the stage for the mentoring.

Many reported that it was beneficial learning about the physiology of coherence and optimal functioning, which supported their understanding of resilience. They found it beneficial that the program is framed as an energy management, self-regulation approach.

Some remarked that trainer, Denise Lackey, did a superb job introducing the Resilience Advantage workshop. Everyone said that the mentoring helped to deepen their understanding of using the skills in everyday situations, making it a very practical and effective system. For some it was life changing.

This was a mature group with many of them having years of experience. The mentor could hear the love the participants have for their work and also heard the toll that the demands of the job, and in some cases personal issues, was taking on them.

As seasoned professionals, they are all very aware of the array of challenges they all face each day and the long-term toll that it can take. With that, they also are aware that the needs are not currently being met. They reported that this program was able to effectively address the core issues that affect their performance and wellbeing every day.

Feedback was given that this program would be of great value for all staff to have. They began to see that with more people trained in using the skills, they would be better able to mutually support one another on the job, when it counts the most, do their jobs better, work together in a more cohesive manner and not burn out doing the work they love.

The mentor felt every person was genuine in the feedback they gave throughout the mentoring process. The mentor also appreciated the effort each person put into the mentoring sessions and for practicing on-the-go what they learned.

The mentor was deeply moved by the effort each put into the mentoring portion and also of the outcomes the mentor was hearing in each. The participants fatigue and overwhelm were palpable, but so was their enthusiasm and love of their work.

Eastern Idaho Regional Medical Center, Idaho Falls, Idaho
Mentoring Session Notes

Mentee: 1

Average session length: 45 minutes

Scheduling comments: This was some difficulty in reaching and scheduling this person

What mentee stated as his/her biggest challenge: This person was feeling that the job might be over this person's head. This made this person feel inadequate and sometimes this person had an attitude of "I can't do this!". Sleep was always a big challenge for this person.

What mentee liked most or found the most helpful: By using "all the tools and techniques" I am finally getting to sleep. By getting quality sleep everything seems possible, even my job!."

Mentee's Comments: I feel more positive, more able to cope. I feel that I was hired for a reason and that I feel that I can do this job. I have a plan of action and I believe that I will continue to use this program on a daily basis. I will use all it. I have gotten into a rhythm of the tools throughout the day."

Mentor's Comments: This person has a delightful personality even when things seemed overwhelming. My guess is that this person was able to maintain these traits around the staff. But inside this person was not feeling composed and balanced. This person worked hard with her practice of all the tools. Ease and Freeze Frame were very helpful to this person.

Mentee: 2

Average session length: 55 minutes

Scheduling comments: Scheduling was a challenge.

What mentee stated as his/her biggest challenge: People who are not logical

What mentee liked most or found the most helpful: “I am feeling so much more hopeful for my team. I can’t wait to see what happens. The only thing that has changed is me! I feel I somehow have allowed the team to have more freedom, maybe I’m more approachable, maybe I am just more at EASE, I thought I was all these things before the program...but something is very different in the way the team is working together.

Mentee’s Comments: I have been able to maintain a more positive focus. Things seem to be 80% excellent and 20% drama. It was much higher than that before thus program. I have been using the Inner Balance, I like the technology, I like seeing where I am and then I can do something about it. I also found the Depletion to Renewal Grid to be very helpful, and then re-setting with Ease.

Mentor’s Comments: This person was so delightful to work with. This person has a very positive and feels that she is a very positive person. It seemed like this program was able to round out the things that this person was already doing and this person found that this program made a big difference in this person’s team sports.

Mentee: 3

Average session length: 55

Scheduling comments: Due to this person’s schedule, there was some difficulty in scheduling

What mentee stated as his/her biggest challenge: This person’s love of the job was beginning to fade. This person felt that being an overachiever was finally getting in the way of be able to do the job without feeling depleted.

What mentee liked most or found the most helpful: Being able to center in this person’s heart. This person felt calmer and less anxious. This person especially felt that the Depletion to Renewal Grid, Prep and the Inner Balance were especially helpful.

Mentee’s Comments: “When the mentor explained the science behind the Inner Balance APP, I understood Heart Variability in a way I had never understood that before. Sounds kind of funny coming from a nurse, but this all makes so much sense to me. I started practicing with the power spectrum and looking at the heart rhythm

patterns in a whole new way. With that and the practice of the tools I was able to change my perspective, and I feel excited about my job again.”

Mentor’s Comments: This person really trusts the trainer! (Denise Lackey) I believe that is why this person practiced and tried the different tools. This person really needed the mentor to go into great detail about the science. “I have gained an appreciation for the aspect and the science behind this program. I never thought about the relationship of the heart to the brain in ‘that way’ before. I am more focused, and I have found Ease. It has brought me back to trust in faith in myself and what I bring to the job and my staff.”

Mentee: 4

Average session length: 45

Scheduling comments: This person was difficult to schedule due to this person’s schedule.

What mentee stated as his/her biggest challenge: Very long hours and exhaustion.

What mentee liked most or found the most helpful: Despite very long hours and being tired, this person still adores this job. This person was thrilled that this person was able to turn everything off, and sleep really well!

Mentee’s Comments: “I think what I noticed the most that when I was not practicing Heart Focused Breathing, Ease and Inner Balance ; I was not sleeping. Using this program I was able to let everything go. I found myself arriving at work refreshed every morning, and coming home ready for my family, instead of coming home ready to collapse in a chair or bed.”

Mentor’s Comments: This person is an extremely positive person! This person has lots of hobbies and also enjoys many physical activities and sports. What this person found was the feeling of all the things that brought this person joy and appreciation and that it could be activated and experienced anytime, anyplace.

Mentee: 5

Average session length: 55 minutes

Scheduling comments: There were some scheduling difficulties

What mentee stated as his/her biggest challenge: When I came back from difficult challenging meetings, I did not want to give that energy to my staff.

What mentee liked most or found the most helpful: Focusing on my positive feelings, bringing that everywhere. I really loved Freeze-Frame, it's a great technique for bringing in my most thoughtful brain and perspective.

Mentee's Comments: "There was a crucial meeting that I had to attend. My heart was in my throat. I told myself use 'it' (the tools) . I felt the flush on my face fade, and my heart quite pounding. This was perfect! I am so proud of myself, I took myself out of the picture for a couple of seconds and then I was able to come up with an option I had never thought of before. It was incredible, and my thoughtfulness made a difference in many people's lives."

Mentor's Comments: This person was already leading a very positive, balanced life. This person was able to access the "light bulb that clicks on" more often. I believe that this person is also very intuitive. This program made tremendous sense to this person!

Mentee: 6

Average session length: 60 minutes

Scheduling comments: Some initial difficulty in scheduling

What mentee stated as his/her biggest challenge: Dealing with difficult situations calmly. I appeared calm, but I wasn't feeling as calm as I looked.

What mentee liked most or found the most helpful: This person really appreciated that this person's perspective changed. This person used the Inner Balance faithfully several times a day and was able to get to level 3 easily and stay in green. I started with Heart Focused Breathing and then moved to Ease throughout each day.

Mentee's Comments: As a leader, this program has helped me deal with difficult situations and drama with more emotional composure and balance. I did not realize that I was letting stress build up; I actually did not realize I was overwhelmed until I started practicing this program. I started paying attention to my feelings and attitudes. I learned how to re-focus, calm down and my perspective and options would change. My new hires have stated in their evaluations of me that I am happy, calm and very approachable. That feels great!"

Mentor's Comments: This person put "their" heart into this program. This person really admires the trainer Denise Lackey. "Denise incorporated personal examples of

how this program worked for her, her family and her work. Denise is very inspirational. You really feel that she wants you to be better, I want that for myself.” This person practiced everything, and loved to be challenged to go further and deeper with the tools and the Inner Balance. This person’s spouse and children really noticed a big change: they commented that they observed that this person is more even tempered, more available at home, just more present. This person’s spouse would also like go through the mentoring program.

Mentee: 7

Average session length: 60 minutes. This person was given an extra session to work out a very challenging situation.

Scheduling comments: No problems

What mentee stated as his/her biggest challenge: There were some pressing personal issues.

What mentee liked most or found the most helpful: This person found that doing the homework, practicing with the Inner Balance, using all the techniques brought this person to a very different perspective in the decisions that this person needed to make. This person was also able to find peace in the decisions that this person made

Mentee’s Comments: “I was able to come to a place of appreciation and emotional balance. These decisions were making me angry. I was able to shift to a place of peace. I was able to figure out what was fair and what was right with compassion, and I left the anger behind.”

Mentor’s Comments: During the five weeks we worked together, this person was able to accomplish so much! This person was able to look at all that was happening in this person’s personal life with courage, dignity and hope. This person was able to increase awareness around feelings and attitudes and was able to shift them when it was necessary. With those shifts, this person was able to sleep better, function beautifully at work and had a new sense of renewal and energy.

Mentee: 8

Average session length: 50 minutes

Scheduling comments: no problems

What mentee stated as his/her biggest challenge: Dealing with and managing extremes shifts in discharges and admissions.

What mentee liked most or found the most helpful: The Inner Balance helped me to see what was really going on in my nervous and how it was affecting my resilience. The idea that I could activate resilience and choose where I wanted or needed to be was exciting. I could check in to see if I really was in the places I was choosing. The whole program was just great!

Mentee's Comments: The main thing is this program has given me a new perspective. I am more aware of myself. I can pull myself into a better place. I know what I can do, and I can choose that. I have also noticed that I don't have to fix everything! I use Freeze Frame: step back get into a place of clarity and sometimes I just to do nothing and then other people step up and do what they need to do. What an amazing feeling of freedom and flexibility.

Mentor's Comments: This person was experiencing a great deal of anxiety, overwhelm and depletion. This program seemed to come just at the right time for this person. This person felt that there was more of an opening between this person's heart and mind. This person was able use this program for alignment in this person's core values. This person was able to find the feelings that this person had when this person started this job, and that we renewing for this person.

Mentee: 9

Average session length: 55 minutes

Scheduling comments: There was difficulty with scheduling. No shows due to emergency situations.

What mentee stated as his/her biggest challenge: Finding the time to practice with the Inner Balance and try out the tools

What mentee liked most or found the most helpful: "When I realized that I could practice the tools and techniques at any time. When I realized 'that' piece; I also realized that I needed to find a time for the Inner Balance and I did."

Mentee's Comments: "I have noticed a huge difference in my overall outlook. I do not perseverate as much as I use to, I am sleeping better. I have also noticed that one of my biggest challenges was lack of control over situations; with Freeze Frame I am able to accept that lack of control, get on with it and do the best I can. There is no blame, there is more of an even flow."

Mentor's Comments: It was very exciting to witness the change in this person's perceptions. This person was so thrilled by the idea that one can activate resilience.

“The idea that one could roll with the punches, that is incredible to me.” This person worked really hard with the Inner Balance . This person practiced Ease throughout the day and found that level 4 was reachable and sustainable. This person’s changes were reflected in work and in this person’s personal life.

Mentee: 10

Average session length: 55 minutes

Scheduling comments: Some difficulty in scheduling

What mentee stated as his/her biggest challenge: A very personal issue.

What mentee liked most or found the most helpful: This person found this person extremely helpful in redirecting his focus so that this person’s personal challenges did not affect the staff. This person found the three concepts of building resilience capacity to helpful. This person followed the flow of the concepts, chose a tool and felt that it gave this person emotional balance and clarity.

Mentee’s Comments: I am now able to understand the importance of emotions and feelings. In my family, we were not supposed to have any; one just fixed the situation and moved on. Of course I had those emotions anyway, but now I am more accepting of them, I don’t feel as if I am a failure. I can choose what I need and I can choose to let it go more easily now. I feel that makes me more approachable and available to my staff and to my family. This has been a gift to me and all those around me.”

Mentor’s Comments: This person was so grateful for this program. It also helped him understand his own family dynamics better. This person not only stated what the benefits were for this person, but I was definitely aware of how this person presented in the last session. It was very moving to experience this person’s change transformation.

Mentee: 11

Average session length: 55 minutes

Scheduling comments: There were some difficulties in scheduling

What mentee stated as his/her biggest challenge: I was not aware of some of my challenges. I thought I was feeling great and doing great. I practiced this program because I was intrigued where it would take me.

What mentee liked most or found the most helpful: This person really loved the Inner Balance, Heart Focused Breathing and Inner Ease.

Mentee's Comments: "Resilience looks different to me now. It's a combination of physiological insight and mental clarity, emotional energy and buoyancy. I was hampered by what I did not know. I am more aware of what is really draining me. I am finding I am bringing more to the table, more than I thought I could ever bring to the table. I find myself sleeping great, being more prepared for meetings, and the biggest surprise is that I did not expect to be more differentiated. That is empowering!"

Mentor's Comments: It was so much fun to work with a person who practiced this program because of curiosity and was absolutely thrilled to experience this program, and not from this person's head. This person would very much like to go through the HM Interventions program.

Mentee: 12

Average session length: 45 minutes

Scheduling comments: Just a couple of glitches, one of them were mine.

What mentee stated as his/her biggest challenge: During these sessions this person was diagnosed with a condition that was challenging. But it also explained some of the challenging symptoms this person was experiencing.

What mentee liked most or found the most helpful: This person found that this program came at the perfect time. By using Inner Balance, Heart focused breathing, Ease, and Freeze Frame; this person noticed that there was a shift in some very negatives attitudes to a place of more acceptance and compliance in this person's medical condition.

Mentee's Comments: "I had an attitude adjustment! I now am going into "this" with a much more open mind. Before this program I was just existing, things would just present and I would take care of it. I did not have any get up and go. I had no idea how depleted I was and not in just the physical domain, probably all domains. I now have more energy. I can handle things. I noticed that my staff wants to talk to me more, and not just about complaints. I feel lighter."

Mentor's Comments: When I first started working with this person, I noticed that my energy had to be adjusted. This person's energy was so low and so negative. I found myself using Ease in our conversations and I hooked myself up to Inner Balance so that I could see where I was during our sessions. By the fourth session, I

found that I was looking forward to working with this person. I think we did some great work and both of us made some major shifts to be able to communicate in such a positive way.

Mentee: 13

Average session length: 55 minutes

Scheduling comments: no problems

What mentee stated as his/her biggest challenge: Energy draining situations with certain staff members.

What mentee liked most or found the most helpful: This person really liked Heart Focused Breathing and Quick Coherence. This person has so many positive feelings and experiences in life. This person loved the idea of bringing that to work when this person needed it.

Mentee's Comments: "When I signed up I had no idea how great this program was going to be. It really is transforming! Everything just flowed this week. My five senses have all peaked. I feel more alert, more aware of everything around me. I feel like my intuition is right on. I trust what I am sensing!"

Mentor's Comments: This person was great to work with. This person couldn't wait for the next assignment. This person was so open to everything. This person's excitement was contagious. This person was able to see big changes at home. This person's spouse was definitely benefiting by this person's ability to step back and find a way to compromise and find more peace and happiness at home."

Mentee: 14

Average session length: 55 minutes

Scheduling comments: There was some initial difficulty with the scheduling

What mentee stated as his/her biggest challenge: Sleep and finding more energy for this person's family.

What mentee liked most or found the most helpful: This person felt it very helpful to follow the guidelines of Prep, Sustain and Re-Set to build resilience capacity. By becoming more aware of where this person was on the Depletion to Renewal grid,

this person was able to step up the use of Inner Balance, Heart Focused Breathing, Ease, Quick Coherence and Freeze Frame.

Mentee's Comments: "I have gained a lot of new insight on myself, as a leader and in my personal life. It has opened my eyes to being open to trying new things, and being open to different options. I now have a broader perspective; I am seeing the bigger picture not just the small stuff that makes it impossible to get to the bigger picture."

Mentor's Comments: This person was able to really step back and look at the process of decision-making. This person was able to realize that some decisions this person made were rash and that by using Freeze Frame, this person realized that the decisions that were being made were from a much more thoughtful place. This person was able to carry all of this insight to this person's personal life.

Mentee: 15

Average session length: 50 minutes

Scheduling comments: no problems

What mentee stated as his/her biggest challenge: "Due to the nature of the department there are many rotating graduate student nurses that depend on me and lean on me. It can be draining,"

What mentee liked most or found the most helpful: Being able to center in my heart anytime, anyplace was so energizing!

Mentee's Comments: "I did not realize how "red" (on the Inner Balance) I was, especially at work. It helped me to acknowledge that I had to be different. There was another person in my department who also did the program (HeartMath). We would remind each other about using Ease, Heart Focus Breathing; whatever it took to get out of the left hand side. (Depletion to Renewal grid). I found the more I practiced the more I wanted to do practice, because I was sleeping better, I was able to de-escalate much faster. I feel I am rolling with things better, not getting rolled over."

Mentor's Comments: I was not sure how this person was feeling about this program in the beginning. Then everything just clicked for this person, and this person was energized and this person was using this program everywhere. This person's spouse wants to go through the mentoring program.

Mentee: 16

Average session length: 50 minutes

Scheduling comments: There were some scheduling difficulties

What mentee stated as his/her biggest challenge: I have a very ADHD brain. I can exhaust myself before I go home to my family.

What mentee liked most or found the most helpful: This person found this program to be the most useful program he had ever gone through. This person found that it encompassed everything this person learned with a way to really live it!

Mentee's Comments: I have been able to step back and not just rush in with an answer or a rash decision. I have found that communication at work and at home is flowing easily. I am using Prep before I go home, I visualize what is going to happen, and it does. I am excited, life has more flow; I am distributing my energy differently. I am not exhausting others and myself.

Mentor's Comments: This person is so likeable! I would imagine that this person's staff appreciates this person very much! This person sincerely has tremendous appreciation for the people in this person's life. What was fun to for as a mentor, I can be very high energy also, so I would adjust my energy so that we did not exhaust each other. When I adjusted my energy to calm and Ease: this person followed the example. This person also noticed what I was doing, and talked to me about it. This person was able to really use the Inner Balance and the Depletion to Renewal grid to adjust energy levels.

Mentee: 17

Average session length: 50 minutes

Scheduling comments: No problems

What mentee stated as his/her biggest challenge: One of the things that this person has to deal with is equipment and technology. When those things do not function properly it creates frustration, tension, anxiety and those feelings lead to exhaustion and depletion.

What mentee liked most or found the most helpful: Heart Focus Breathing and Freeze Frame were very helpful to this person.

Mentee's Comments: "Yesterday I was struggling. I said to myself use your tools. You need to stop! I did, I used Freeze Frame with Ease as my positive feeling. The

struggle was less. I was able to get to a calmer place and figure things out. By handling things in a calmer way the past few weeks, I am more approachable.”

Mentor’s Comments: The more this person practiced the more this person saw this program as a tool great for success. This person had “always” struggled with sleep, when I asked this person how the sleep issue was doing...this person responded “that’s so weird I have been sleeping and I just haven’t thought about it, it just has been happening. I don’t stress about it, I now know that I can sleep.”

Mentee: 18

Average session length: 55 minutes

Scheduling comments: no problems

What mentee stated as his/her biggest challenge: Finding balance in all the domains of resilience.

What mentee liked most or found the most helpful: This person really appreciated the fact that one could step back in meetings do a Freeze Frame and come up with different options. “I feel like when I am in a red (reference to low level coherence on the Inner Balance) situation, I can step back and get myself into a green spot. (reference to higher coherence on the Inner Balance App).

Mentee’s Comments: “This program has given me the opportunity for self-reflection. I have become more aware of where I am on the Depletion to Renewal grid, and then I can do something about it if I am of the left hand side of the grid. I have been noticing more of what is around me; not just about me, but everything around me. I am feeling pretty good about everything.”

Mentor’s Comments: It was very helpful for this person to realize that sometimes being in red (on the Inner Balance) is just a fact. It is not always good or bad it just is, and we can choose to do something about it. This person found it helpful to understand that third or fourth level green was not going to be a constant. This person was feeling discouraged because this person was not able to sustain that level at all times. When this person said it out loud, this person was able to laugh about it and discover a whole new level of Ease about the process.

Mentee Name: 19

Average session length: 55 minutes

Scheduling comments: There was some difficulty scheduling the initial appointment

What mentee stated as his/her biggest challenge: “I use to sleep for 10 or 12 hours but I would wake up feeling awful.”

What mentee liked most or found the most helpful: This person is in an adrenaline producing environment. It is necessary to this particular department. This person found that re-setting after every single incident was the way to obtain quality sleep at the end of the shift. This person would at least use Heart focus breathing, and Ease throughout the day.

Mentee’s Comments: “I really want to make a difference in my department. This program hit me like no other program I have been involved with. I understand this program, the science makes sense, I can’t believe it did not hit be sooner, considering I am in the medical field.”

Mentor’s Comments: It is so exciting to work with someone in the medical field, who is open to different ways of looking at things. This person was so excited by the science. This person was able to laugh and comment that the “” equipment is surrounding this person every single day. This person had not thought about using the feedback in this way. To be in the presence and witness someone looking at their world with fresh eyes is very rewarding!”

Mentoring Session Notes

Mentee 20

Average session length: 50 minutes

Scheduling comments: Some difficulty initially tracking this person down.

What mentee stated as his/her biggest challenge: The biggest challenges for this person are current work related issues. This person identified many of the challenges they all face in this person’s department: very large patient load, very sick patients, lots of drama, and a protocol that must happen as if each patient is in a life or death situation.

What mentee liked most or found the most helpful: To be able to recharge and re-set after incidents. To be able to make adjustments in one’s own attitude. “It’s easier to help others, if I change myself.” This person found the Inner-Ease technique, Prep Technique and Heart-Focused Breathing especially helpful.

Mentee’s Comments: “I am not as overwhelmed as I use to be. I noticed that I am not breaking down and just crying from exhaustion. The quality of my sleep has

improved greatly. I have been able to take the significance out of things and I have been much happier at work and at home.

Mentor's Comments: This person seemed to be very steady and positive person. This had multiple resources and used them. This person felt that this program added a whole new dimension to this person's "toolbox". As much as this person was doing to activate resilience, this person felt that this program brought more immediate ways to deal with the frantic part of this person's job.

Mentee 21

Average session length: 60 minutes

Scheduling comments: This person was on their fifth week of working straight without a day off. Scheduling with this person was very difficult.

What mentee stated as his/her biggest challenge: The biggest challenge for this person was staffing. Due to the nature of this department people are coming and going. There is a great deal of training going on.

What mentee liked most or found the most helpful: The three strategies of building resiliency capacity and the Inner-Ease Technique were very important for this person. This person also was able to find some very important information when this person applied Freeze Frame to a very challenging and emotional issue. This person was very surprised that the feeling of compassion and forgiveness came up. Finding a different perspective surprised and excited this person. The unfolding of the situation went well for everyone involved.

Mentee's Comments: "I am surprised that I have not crashed with this unending schedule. I am surprised to find ease among the chaos."

Mentor's Comments: This person was very skeptical at the start of this program. This person was going home exhausted, eating going to sleep and that is about it. This person was able to find a way to go home and stay up for a while and do some other things besides work. This person's quality of sleep improved. Even though it was very difficult to schedule with this person, this person was extremely enthusiastic when we finally had a session. This person was always excited to share insights and a different perspective.

Mentee 22

Average session length: 50 minutes

Scheduling comments: One missed appointment due to an emergency

What mentee stated as his/her biggest challenge: The drama from a couple staff members was quite depleting for this person.

What mentee liked most or found the most helpful: Initially this person found Heart -Breathing, the Depletion to Renewal Grid and the Inner Balance app very useful. Than this person really felt the value of Freeze Frame, Inner Ease and the three strategies for building resilience capacity.

Mentee's Comments: "I noticed I had a bounce in my step, especially after leading the meetings I used to dread." "I say the biggest value for me for learning to reset! I use to hold a grudge. It was hard to let go of the stuff, the drama. It was the way I was brought up, one does not let it go, one suffers with "it." "When I learned to do things differently and had a different perspective, I noticed that there was calm, and there were bigger things in the world. I did not want to stay in the left side of the Depletion to Renewal Grid. The biggest part was recognizing that I was there (the left side) a lot. I could choose differently and chose the right hand side of the Depletion to Renewal Grid. It has changed my life."

Mentor's Comments: To be there to witness to this person's transformation was exciting! Each week this person practiced the strategies of building resiliency. Freeze Frame, Inner-Ease, the Inner Balance and being aware of what this person was feeling made a big difference in the way this person started running the department. There were other people in the program who noticed a bounce in this person's step and a sense of renewal in this person.

Mentee 23

Average session length: 55 minutes

Scheduling comments: Due to the nature of this person's position, there was some difficulty scheduling sessions.

What mentee stated as his/her biggest challenge: Aging parents, frustration with heavy work-load and trying to do everything perfectly.

What mentee liked most or found the most helpful: This person noticed when everything in this person's life was highly charged with emotional challenges and that this person's physical symptoms such as backaches and headaches increased and the quality of sleep declined. This person found that being on the Inner Balance at least twice a day and accumulating at least 300 points, being aware of which quadrant one was in and being able to choose what to do about it, especially resetting with Inner-

Ease, that the physical symptoms went away and the quality of sleep improved tremendously.

Mentee's Comments: "One day everything seemed too much, too many meetings, too much drama, including mine and too much overload and overwhelm. I did a Freeze Frame. I asked myself what do I need? From a very different calm perspective I realized I could cancel non-essential meetings, and what came to me so clearly was that I did not have to be so perfection, and my need to be perfect was causing me and others more drama than was necessary. I gave myself a break. What that gave me was a feeling of calm and ease. I had less anxiety and a very different perspective."

Mentor's Comments: This person "knew" that this person had to let things go. This program gave this person a way to do it because this person experienced and practiced the tools and techniques daily. This person also practiced with the Inner Balance App at least 3 times a day. This person was also able to look at what was really important to this person's core values. This person found that there was more energy available for the family. There was a very interesting aha moment for this person. At the end of the day this person was always speeding home and realized that there could be a gentler transition from work to home when one slowed down, enjoyed the ride home and prepped for a wonderful evening. This person had never connected that piece before. This person's family really saw the difference.

Mentee 24

Average session length: 55 minutes

Scheduling comments: This person requested a different mentor for the fourth session for very personal reasons. The Lead Project Mentor did the fourth session with this person.

What mentee stated as his/her biggest challenge: This person experienced a great deal of drain and depletion because of this person being so kind. It was difficult for this person to give a staff member "upsetting" news. This person would take it on or would get very anxious or frustrated before meetings this person had with staff. "I feel my energy being pulled out of me."

What mentee liked most or found the most helpful: This person found the Inner Balance App to be extremely beneficial because it was so factual. This person found Freeze Frame, Heart-Focused Breathing, Prep and Inner-Ease. This person reported that meetings went more smoothly especially if there was self-awareness around feelings and attitudes

Mentor's Comments: In the fourth session, it was clear of this person's interest in the program and that this person was really trying to incorporate the skills learned

into each day. A personal issue was very challenging for this person and when we addressed that directly, this person could see how using the techniques would be beneficial. It then “clicked.” This person had a great attitude and was very open to learning.

Mentor’s Comments: There was an underlying unspoken challenge going on for this person. I did not know about it during the three sessions we had together, so I really was not able to get a lot of information from this person about the program. I did get the sense that this person found that the techniques helpful and the Inner Balance App allowed for more awareness and calm.

Mentee 25

Average session length: 55 minutes

Scheduling comments: There were some difficulties with scheduling.

What mentee stated as his/her biggest challenge: This person loved everything about the program. This person’s biggest challenge was finding a way to remember to practice every day. There was also a very personal challenge at home.

What mentee liked most or found the most helpful: This person received something very special from this program—the ability to become more aware of how this person was really feeling about certain issues. This person was pleased that there was a real consistency and clarity about certain decisions that needed to be made and this person felt that the decisions were made from a place of clarity.

Mentee’s Comments: There was someone who was really draining me at work. Or shall I say I allowed it. I am finding a way to approach this person differently. I guess I would say I am approaching this person with an open heart. Our personalities are very different, but I am not finding this person draining anymore.

Mentor’s Comments: This person resonated with this program. This person would like to potentially do the HM Intervention program and possibly further training through the IHM training programs. When this person stepped up the practice with the three strategies of building resiliency, prepping, sustaining and resetting, this person’s energy seemed to calm over the course of the 4 sessions. This person was less frantic, was sleeping better and was able to find humor in the challenges in this person’s life.

Permission was granted by the nurses to use the following quotes:

“This program has really made me become more aware of my attitude, my reactions and how it affects my staff. I have been able to step back and look at myself first and then see how I can help others. To be able to recharge and reset after incidents has made a big difference in people seeing me as more positive and composed.”

“It has been a great experience. This program has opened my eyes to what is possible and what is not. There are some things I just can’t change, but I can choose to change me and just maybe others will change around me. I must model the way so others will step up.”

“At the beginning of the training I was very skeptical. After talking with the mentor and getting assignments and practice, the whole program made sense. This program has helped me to be calmer. When I use a technique or the Inner Balance it clears my head.”

“With my use of the techniques especially Inner-Ease, I see the ease everywhere instead of the chaos I was seeing. That was all I could see. I talk with my staff and I can see the ease in them.”

“My staff and my family have seen a change in me. I am not so quick to react.”

“I have been really happy and excited to use these tools and techniques. I would love to go on to get further training in the HM techniques.”

Mentee Quotes from Program

Quotes with permission to share.

“In terms of leadership, I am looking at the situations, stepping back doing a Freeze Frame and I am reacting more positively. At home, I am doing much better. I know what my kids and husband do that trigger me. Things are great at home. I know what I can do, I recognize where I am and I can choose to change it. I practice before I go home with prep and I have been using Freeze Frame at home. I like the way I feel. Since this program started, I had some very challenging situations. I was very emotional and it was not appropriate at the time to talk about it at work. This program came at a perfect time so that I could learn to handle my emotions and be less reactive. I am also getting much needed sleep. I am waking up feeling refreshed! That has been a huge benefit to me.”

“I’ve noticed that I am tolerating things better. I feel more understood, so I must be communicating better. My family has commented on my calmer state, they say that I am easier to be around. Not so moody.”

“I have been practicing with the techniques and the Inner Balance every day! The biggest insight for me is recognizing where I am on the Depletion to Renewal Grid, where do I want to be, and how will that change the situation!”

“You can see who is not using these techniques, you can really see it...they are beat down. I now know no matter what kind of shift it has been whatever has happened that I want my staff to reset.”

“There was a doc who was going on and on and on. He did not get our process. I felt myself rising to the upper left quadrant. I brought myself down by using a Freeze Frame. I used ease as the positive feeling. This brought me to a coherent place to work with this doctor and deal with the situation more effectively and calmly.”

“I know this stuff clinically but I did not apply it. I use to hold on and harbor my feelings. I would stew and become exhausted. I believe I am a different person. My kids say I am a different person, I am not coming home exhausted and I am more present for my husband, my kids and for me.”

“So much good stuff! I’m becoming more aware of everything around me. Sitting in church, I became more than the words, I took it more deeply, feeling what was being said.”

“I discovered that being in red on the Inner Balance does not mean I failed. Red just is! I can do my very best to change it. When I first saw the red, I noticed that I was not practicing my program as much as I had been in the beginning. It was also one of those terrible weeks. I took the time to understand why I was in red. I took the time for self-reflection. I became more focused and I had more clarity. More Green. This HeartMath stuff is great. I am back on track! I can feel when I am in low or high coherence now without the Inner Balance.”

“I am not taking everything home with me. I am prepping before I go home. I don’t feel exhausted at the end of the day. This has had a very positive effect on my most important relationship, my husband. He appreciates the shift. I had not connected that the ride home was my time alone to slow down, put on beautiful music. I have stopped speeding home; this was part of the exhaustion. On my way to work, I now notice the beauty of the sunrise. I am trying to slow down and see what is beautiful around me. It makes a huge difference in how I have started the day. I prep for a good attitude when I get to work, I know that there are always people waiting for me even before I can settle down, I now do that in the parking lot, it’s my job, I have great people around me. I am choosing the right side.”

“Yesterday I had a day where I was struggling. I said to myself, you need to stop and use your tools. I did, I used Inner-Ease. The struggle was less. I was able to calm down, and everything flowed from there. It’s easier to handle things from a calmer place. I become more approachable to everyone.”

“I feel like I sleep better! I have always struggled with that.”

“I have seen what a difference it can make to the people around me at work and at home, when I step back and become more thoughtful about my reactions and what I say. The people around me seem to be reacting in a more thoughtful way also. I am using this program on a daily basis. I am using the Inner Balance at least twice a day. In the past four weeks I have noticed that I feel more energized, more intuitive and aware. This program is a functional, usable way to keep one rejuvenated. I expect more things will unfold in my life as I make this program second nature. I am putting out the feeling of ease and positivity and I do not have the things coming at me like the person who held this job before me.”

“We are in a place (the hospital) where there is great weight, death and high anxiety. Having the ability to navigate with decorum, energy, positivity and the overall feeling of coherence, can only be a shift for the better for everyone.”

“When there are problems at work, I roll with it. I am not getting rolled over. Inner-Ease has been a go to tool for me.”

“As a leader, I have seen a big change in me with this program. I have a broader perspective in my approach to my staff. I’m stepping back and seeing the bigger picture. Using the techniques and the Inner Balance has opened my eyes to the bigger picture. I use to dwell on the small pieces. I now have a better connection with my team. I have changed my perspective and I feel better about everything!”

“I now understand about what quality of sleep means. I am getting 5 or 6 hours of sleep a night and for the first time in years, I am waking up rested every day.”

When I signed up for this program I had no idea that in such a short period of time my life seems transformed. Everything flowed this week (week 4). My five senses have peaked. I am more alert. I feel like my intuition is right on. I trust what I am sensing. This program has been wonderful in every area of my life.”

“I have had an attitude adjustment. I went into this program open mind and I did the practice that was recommended. I was just existing and I had no oomph. I was so depleted in so many ways. I now have more energy. I can handle things. I feel lighter. I am getting more from my staff. I am taking the time to know them better. Before this program, I might make a blanket statement. I am able to look inside and see if

there is a more flexible way of doing things. I am definitely have more clarity and self- awareness.”

“I have more physiological awareness, mental clarity and emotional energy. I was hampered by what I did not know, so I threw everything I had at a decision. There was no insight, no intuition involved. I am much more aware of how to go about making a coherent decision. I am now bringing more to the table.”

“This program has helped me to see how my emotions effect my decisions and my staff. I am now able to make quicker decisions that seem right for everyone. I had no idea how depleted I was. I have more energy, my blood pressure is under control and I am more present at work and at home. Communication seems to be more effortless.”

“There are some things I cannot control and I have released that. Instead of feeling out of control, I am able to accept certain things for what they are. The biggest lesson I received from this program is the idea of be able to activate resilience. That concept excites me, and that is worth the daily practice!”

“I have a different perspective. I am more aware. I can pull myself into a better place. I now know what I can do...I can choose.”

“As a leader, I used to let the stress build and build until it overwhelmed me. I felt like I could not breathe. In the four weeks we have been working together, I have done every homework assignment, I Prep, Sustain and Re-Set, and I use the Inner Balance on a daily basis. I now have focus and clarity; I do not let the stress build. My perspective on life has changed. My staff says I am calm, happy and very approachable. My family feels like this program has been very beneficial to them! “

“Through these skills I am learning ease and Flow. Depletion is no longer my default.”

“I have been sleeping very well. With Heart-Focused Breathing, it has helped me to let it go.”

“I did not know if I could do this work any longer. I just kept hearing I can’t in my head. Now I feel like I did when I got this job...I can do it!”

“I am not missing things because I am exhausted! I am more aware and less depleted!”

“I say the biggest benefit is Re-Setting. This has been huge for me! I also like the Prepping! The last thing to go for me was the grudge. I couldn’t let go of stuff. ‘Don’t let it go...make yourself suffer.’ This is huge for me, when something was getting

under my skin, I couldn't let it go. With this program and training, I chose to let it go. I noticed calmness and I realized that there are bigger things in the world...I chose not to stay in the left hand side, in depletion. The biggest part was becoming self-aware. The other thing I've noticed is that I have taken the higher ground. I have a bounce in my step. I feel a tremendous sense of accomplishment. I feel better, because I have done the right thing. People have noticed that I have made changes. One person commented that I seemed lighter on my feet. These really, really work!"

Appendix E: Program Evaluation Tool

Denise Lackey Ph.D. A.B.D. Leadership Development—Date:

Please rate today’s presentation on a scale of 1–5 (1= lowest, 5=highest)

1 = Never 2 = Rarely 3 = Sometimes 4 = Often 5 = Always

Presenter: Denise Lackey

	1	2	3	4	5
Was the speaker easy to understand?					
Were the concepts shared today explained well?					
Was the presentation applicable to your job?					
Would you recommend this training?					
Was the physical setting comfortable?					
Were the lunch choices satisfactory?					

Appendix F: Conclusion Reports

Conclusion notes from
Yavapai Regional Medical Center
Leadership Development Research Training
12/4/13
Conclusion Session with Diane Drexler, CNO

Notes from final training with all participants.

Question asked what was your feeling about the training before it started, versus after training started.

Denise facilitating

Personal thoughts pre-training:

Initially started thinking about charge nurse training that we were implementing and if it could complement

Did not know what the training was or what it was about, would have liked a 2-month lead in for scheduling and time off

Really excited about the Positive Leadership angle and strategies learned

Sure wish we could have had this training sooner as new leaders

Was not interested at first prior to starting, until we begin and I saw how it affected me

I am a night shift nurse so it has been a challenge coming in on days, consider having a night shift training

I had no idea about leadership

Oh no... another "touchy-feely" workshop that won't last

This provided us with more information to share in the charge nurse role

Staff loved the positive leadership that we added to our day (putting on charge nurse assignment sheets) that they ask for it if we forget to put the positive quote on the sheet

Consider:

Use real life experiences for explanations

Glad to see that nursing Director is leaving on time so she can take care of her self
"apply your own O2 mask on 1st before trying to fit it on someone else" example of using positive leadership on self first

Check In: post-training (after 8 months of training) Denise facilitating

It was perfect:

Unfortunately nurses are flying by the seat of their pants without this type of training
Positive leadership strategies and mentoring is a separate skill set and I have utilized the learning's from your training.

This training has provided a path for me to travel regarding the framework of the VDL model. It has given me a lens to look through as I do critical-thinking, and train charge nurses

I am more authentic and positive as a result of this leadership

Robyn "brought this mindset with her when she came"

This training has helped because everything is always revolving and it gives me the ability to come back to center and not be so reactive

Taught to be more relaxed and honor people around me more. I feel and think more before becoming so reactive

This program has dramatically improved my self-awareness. I am more involved with learning about leaders and I am more engaged with the charge nurses

The training has been a tremendous help and has further developed my thinking skills by giving me a model to evaluate my decisions

It has helped a lot with daily operations and positive experiences

It's helped me to put together leadership "values statement for our team"

The HM tools have helped me to know when others are not using them

I feel so energized since using the HM tools. I am interested in more training

This program has aligned my leadership with VDL model

I am more confident on how to structure and provide for new leaders

I see how this fits with Studer Group principals

I am not reacting so much (not in HM intervention group) as I use self-reflection and it is encouraging for me

I generally address behavior and not attitude. Since the training, I am addressing both as I have a greater understanding of how to address using the training tools (SBI— Situation, Behavior, Impact)

I have noticed that I am more focused on inner and making sure that I am balanced instead of external focus

I understand how necessary succession management is to the survival of organizations; I had never given it any thought prior to this training.

I have learned to better manage my emotions, physical health and immune system.

I am consciously aware of how to generate positive health results based on the training

The following information was received by the CNO when debriefing with the team. The team was asked to provide thoughts or take-a ways from the training.

Socialization has improved with employees and we are working together better

Succession management is a focus of mine now. I am constantly looking for leadership in other individuals
 Leadership and nursing—I see the relationship between the two and its importance
 I am paying more attention to my style of leadership
 I am better equipped to deal with negativity
 My self awareness has improved and my reaction to dealing with staff is better (2 comments similar to this)
 Building leadership skills and dealing with staff
 What kind of leader I want to be is a positive leader
 I am understanding that the power of positive thinking is contagious and its impact on my immune system
 Physiological response to negativity is apparent to me now as is the “Impact of 5” meaning, 5 minutes of a pos/neg thought
 Inspirations, spread excitement to the ER nurses on my team
 VDL model fits what YRMC’s mission is (we did an alignment exercise)
 I think you should expand this to other floors

Action planning for teams over next 30 days:

Combined ED Goal

Continue to increase integration of the 2-ED’s
 See both ED’s viewed as equal
 Competition vs. cooperation (do not be competitive and do not let the MD’s create competition “this ED is better than that one”)
 Change view of Triage as a place into Triage as a process
 Shared goals:
 Meetings quarterly with UPC’s
 Consider combined charge/director-team meetings
 Floating staff between two campuses to reduce variability
 MDs pitting EDs against each other
 VDL Model how to keep this training going, disseminating information to our teams
 Charge nurse meetings
 Focus on one element at a time and roll out on both campuses

Agreed upon combined ED goals:

Integration:
 Weekly goal:
 Is to combine quarterly charge nurse meeting or at least disseminate information at same time. Robyn/Irene
 Finalize VDL presentation to be rolled out to rest of staff. Robyn/Irene
 Monthly goal:
 Is to have 1st presentation overview VDL model which will happen in January (Robyn/Irene)

Authentic Self will be first element training (Sarah, Sam & Jan)

Conclusion Notes

Eastern Idaho Regional Medical Center

Leadership Goals Conclusion Session with Kathleen Nelson:

1/2014

People are 100% vested in patient experience and positive environment of care.

Improve recognition/positivity in our department—Mutual Appreciation

Top 25 HCA Patient Experience

Build and maintain a relationship of trust

Support and stay with CPOE

World Peace, Patients always satisfied, Employees always satisfied

Within—Goals

1 day

Positive attitude daily

Determine approach in each area

Apply what we learned today

Let go of the past

Get people to CPOE class

Demonstrate 5/10 by leaders

1 week

Find out how people want to be recognized

Implement/Tweak

No meeting zone

Do not take offense

100% to training; 2nd Training awareness

Leaders teach 5/10 principles to team leaders

1 month

Action on personal recognition discovery

Incorporate to CTL's

Utilizing evaluations to set realistic goals

Group Retreat

100% 2nd training

Tea leaders share with all staff 5/10

1 year

Have recognized all personnel in some positive way

Staff involvement

Leadership Discussions

In HCAPS scores—continued

Global—5 year

New charting system

CPOE Success

Scores up by 5%

75% patients

905 employee satisfaction
Evaluations and Celebrate!

Feelings before Training:

Skeptical/Doubts
New leader—intrigue/interested, hopeful, open minded, thankful for Leadership training
CNO—Excited, blessed for being able to participate
Previous 1:1
Don't remember, increase for the challenge
Happily unaware
Better leader (1st email? Need to do?)
Didn't know what to expect

Feelings after Training:

See validity/difference/sustainability
Change as in my mindset, personal and professional

Incorporating into daily operations, all on same page
Challenging with day to day—challenge to use
Embraced by everybody
Sense of community/same page/common goal
Helped a lot /open awareness, not afraid to ask
“talk the talk, walk the walk” “We did it”
Profession a little frightened, r/t day to day
How to keep it going
Personally has helped
‘Impact of 5’
More tools in arsenal
Appreciate power of teamwork “gift”
No meeting zones: Tuesday /Leader Rounding
Kudos Board-Lab
Positive attitude; appreciation to “C” Suite]
Collaboration, Opens eyes to bigger picture
Fun during training
Wish I could have been in HeartMath
Glad and Grateful!

Question #1—Do positive practice in orgs affect org. performance? Does positive performance foster org. effectiveness?

Ex new grad basic comp.
Influence by leaders
Positive, helpful

Increased success
 Orientation
 Saw difference in NICU candidates—hire from attitude
 Discipline (3 HM—3 No HM)
 Coaching session (helping to be successful)
 Middle of conversation—provided positive statement
 Changed the dialogue—gratitude
 Crucial conversation
 Scorecard—Used as evidence
 Shifted with positive
 Town hall meetings (Patient experience)
 CTL's (discussions about attitude)—Perceptions

Question #2—Which positive practices do you think are most strongly related to elevated performance?

CTL
 Training; value of CTL
 Set the tone
 Crucial Conversation
 SBI situation, Behavior impact
 Respond immediately to the situation
 Positive recognition of individuals
 Scorecard
 Thank you cards
 Gratitude journal
 RT—Recognition

Personal Reflection—Actions and Future:

Can control reactions (and Leadership and HM)
 Self-Reflection before speaking is helpful
 Realizations: “I can chose my attitude”, Set your attitude
 A lot of Energy: Positive EME, EM Field—Negative—3 Ft
 Positive attitude influences people
 “Enjoying working with me”—R/T not being
 Pleasantly surprised—“can make more of a difference than I thought”
 Personal accountability
 Personal initiative
 Social
 Global” r/t not being

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