

STRESS AND BURNOUT IN PHYSICAL THERAPISTS

BY

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ABSTRACT

STRESS AND BURNOUT IN PHYSICAL THERAPISTS

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Background: Psychological stress can be viewed as occurring when demands exceed an individual's adaptive capacity. Burnout is an occupational, psychological syndrome defined by three dimensions, high emotional exhaustion (EE), high depersonalization (DP) and feelings of low personal accomplishment (PA). Much is known about stress and burnout in physicians and nurses and their association with poorer quality of care, increased medical errors, and attrition. Although a few older studies have examined burnout in physical therapists (PT), most have focused on specific practice settings or geographic regions and the findings have been inconsistent. No studies of stress in PTs have been identified. **Purpose:** The purpose of this study was to measure the prevalence of burnout and perceived stress in a national sample of PT members of the American Physical Therapy

Association (APTA) and to determine if high-perceived stress is associated with any dimensions of burnout. **Methods:** A cross-sectional survey design was used in which recruitment was done through an e-mail invitation to a stratified sample of 6,500 PT members of the APTA. The invitation asked PTs to agree to participate in the study and to complete an on-line survey that included 1) the Maslach Burnout Inventory-Health Services Scale (MBI-HSS, 2) the Perceived Stress Scale-10 (PSS10), and 3) demographic questions.

Results: Of the 1,366 PTs who completed the survey, 69% were female and 92% were white, which is similar to the PT membership of the APTA. More than a quarter of the PTs (29%) were found to have high emotional exhaustion. Burnout, defined as high EE, high DP and low PA was found in 13% of PTs. High perceived stress, which was found in 15% of PTs, was found to have a modest relationship with EE ($r(1,338)=.21$, $p=.006$) and a moderately strong relationship with burnout ($r(1,338)=.359$, $p<.001$).

Conclusions: The results of this study indicate that 29% of PTs are experiencing high emotional exhaustion and 13% have burnout. In addition, 15% of PTs have high-perceived stress which was found to be associated with high EE and burnout.

Chapter I

INTRODUCTION AND BACKGROUND

The prevalence of stress and job burnout and factors associated with burnout has been routinely reported in nursing and medicine and much is known about the negative effect of burnout on health, attrition and patient care. Research of burnout in physical rehabilitation professionals, however, has been limited. The effective relationships physical therapists (PTs) must have with patients and their families as they face life-altering challenges suggests that PTs are at risk for experiencing burnout, yet data about burnout in PTs is minimal and outdated. Knowledge about burnout in PTs is the first step in being able to assess its effect on health, attrition and patient care. Thus, the aim of this research is to determine the prevalence of stress and burnout in physical therapists and to investigate the relationship between perceived personal stress and the different components of burnout.

In the publication, *“Stress in America (TM): Our Health at Risk”* released by the American Psychological Association in January, 2012, 22% of Americans reported extreme stress, and 44% said their stress had increased over the past five years, a finding believed to have long-term consequence on people’s health. Surveyed Americans reported

symptoms of stress including irritability or anger (42%), fatigue (37%), lack of interest, motivation or energy (35%), headaches (32%), and upset stomachs (24%).

Job stress is defined as the harmful physical and emotional responses that occur when the requirements of the job do not match the capabilities, resources, or needs of the worker (NIOSH Publication #99-101). Twenty years ago, a United Nations report called job stress “the 20th century disease”. Shortly thereafter, the World Health Organization (WHO) considered job stress to be a “worldwide epidemic”.

Unfortunately, many believe that not much has changed over the past two decades. In a 2012 report published by the National Small Business Association and Humana, 93% of small business decision makers reported high stress as their top employee-related concern. They believe their employees’ physical and mental health to be critical to their bottom line. This is probably a correct assessment because health care costs for workers reporting elevated levels of stress were 46% higher than workers who felt little stress (Goetzel, Anderson, Whitmer, Ozminkowski, Dunn, & Wasserman, 1998). In addition, employees with high occupational stress had significantly higher physician-excused absences and were more likely to be absent 5+ days per year compared to workers with less stress (Heaney & Clemans, 1995; Jacobson, Aldana, Goetzel, Vardell, Adams, & Pietras 1996).

Personal and job related stress have implications for both individuals and business, and the health care profession may be especially vulnerable to the negative effects of stress. Freudenberger (1975) and Maslach and Jackson (1981), have explained that although social service and health care professionals may experience job stress, these professionals may have an additional risk of developing a condition known as burnout because their work is dependent on establishing successful relationships with people who often have serious physical and emotional needs.

What is Physical Therapy?

Physical Therapy is a healthcare profession with "...an established theoretical and scientific base and widespread applications in the restoration, maintenance, and promotion of optimal physical function" (Guide to Physical Therapist Practice, p.13). According to the United States Department of Labor, PTs are healthcare professionals who, "Assess, plan, organize, and participate in rehabilitative programs that improve mobility, relieve pain, increase strength, and improve or correct disabling conditions resulting from disease or injury" (Bureau of Labor Statistics, U.S. Department of Labor, Occupational Employment and Wages, May 2013, 29-1123 Physical Therapists, on the Internet at <http://www.bls.gov/oes/current/oes291123.htm> (visited August 22,

2014). PTs also develop fitness and wellness programs for individuals to enhance fitness and performance and prevent injury.

The Commission on Accreditation of Physical Therapy Education (CAPTE), accredits entry-level academic programs in physical therapy. There are 218 accredited physical therapist education programs in the United States, with all but the University of Puerto Rico awarding a doctoral degree (Commission on Accreditation of Physical Therapy Education, on the Internet at <http://www.capteonline.org>, visited August 22, 2014). All PTs must have graduated from an accredited physical therapist program before taking the national licensing examination. All states require PTs to be licensed, although other requirements vary from state to state.

Physical therapists practice in acute care hospitals, long-term care facilities, inpatient rehabilitation facilities, outpatient offices, homes, hospices, research centers, schools, industrial settings, fitness centers and sports training facilities. Work as a PT can be physically demanding because PTs need to physically assist and sometimes lift patients during the rehabilitation or training process. The practice of physical therapy is also emotionally demanding. Individuals who seek services of a PT most often have pain and have had their daily functioning interrupted because of injury or illness. Although some patients may only need a short course of PT, others require months or years of

therapy to recovery from conditions such as multiple fractures and soft tissue trauma or spinal cord injuries. PTs are expected to be able to work with and support the emotional needs of people who may need to rely on a wheelchair for mobility, or who must learn to use a prosthetic leg for walking following a disfiguring amputation. In addition, PTs also need strong interpersonal and communication skills. They need to educate patients about their condition and treatment and be able to train family members and caregivers so that home programs, environmental modifications and safety concerns can be addressed. According to the Occupational Information Network, O*NET OnLine, PTs must have knowledge of psychology and counseling and have skills in critical thinking and social perceptiveness to be able to motivate & coach patients and clients throughout their recovery and toward goal achievement (<http://www.onetonline.org/link/summary/29-1123.00> visited August 22, 2014). In 2014, PTs held approximately 204,200 jobs. Although the number of PT jobs is probably greater than the number of practicing PTs due to some PTs working part-time and holding two or more positions, the majority of PTs work a 40-hour week. About 60% of PTs work in hospitals or private outpatient offices. The employment of PTs is expected to grow much faster than the average for all occupations. From 2012 to 2022 employment opportunities for PTs is predicted to increase 36%. In particular, opportunities are

predicted to be especially good in acute hospitals, sub-acute rehabilitation facilities and orthopedic settings where the elderly are most often treated, and in rural areas where access to rehabilitation services are often limited (Bureau of Labor Statistics, U.S. Department of Labor, Occupational Outlook Handbook, 2014-15 Edition, Physical Therapists, on the Internet at <http://www.bls.gov/ooh/healthcare/physical-therapists.htm> (visited August 22, 2014)).

Stress and Burnout in Health Care

Several investigators have determined that the prevalence of high stress and burnout in the health professions is higher than the general population (Dyrbye & Shanafelt, 2011; Passalacqua & Segrin, 2012; Purcell, Kutash, & Cobb, 2011; Shanafelt, Balch, Bechamps, Russell, Dyrbye, Satele, Collicott, Novotny, Sloan, & Freischlag, 2010; Waldman, Diez, Arazi, Linetzky, Guinjoan, & Grancelli, 2009) and that the effects of stress and burnout should be a serious concern for everyone. High stress and burnout have been found to negatively affect patient care and the well being of health care providers, particularly nurses and physicians (Aiken, Clarke, Sloane, Sochalski & Silber, 2002; Cimiotti, Aiken, Sloane & Wu, 2012; Coffey & Coleman, 2001; Dyrbye et al., 2008; Estryn-Behar et al., 1990). Leaving the nursing and medical professions has also been associated with high levels of stress and

burnout, (Harwood, Ridley, Wilson & Laschinger, 2010; Shanafelt, Sloan & Habermann, 2003; Shanafelt et al., 2011), yet information about effects of stress and burnout on PTs and their patients is not available. This void of information is largely due to the fact that study of stress and burnout in PTs has been minimal and is outdated.

Knowledge about the projected need for health care professionals, coupled with the association of stress and burnout with attrition and patient care, has led researchers and public health experts to call for academic institutions to prepare health care professionals with strategies for dealing with stress and the emotional challenges of working with patients in need and for health care organizations to create work environments that reduce the risk factors for stress and burnout (Dyrbye, et al, 2010; Krasner, Epstein, Beckman, Suchman, Chapman, Mooney, & Quill, 2009; Shanafelt, et al, 2003).

What is Stress?

Defining the term “stress” is not simple. Different disciplines such as engineering, physiology and psychology have varied perspectives of stress. As Cox wrote in 1978, “the concept of ‘stress’ is elusive... It is a concept, which is familiar to both layman and professional alike. It is understood by all when used in a general context but by very few when a more precise account is required .”(Cox, 1978, p.1). Hans Selye

(1907-1982) borrowed the term “stress” from physics and used it for referring to the demands placed on an individual, the challenge to a person’s homeostasis, and the evoked response of adaptation (Chronousos & Gold, 1992; Selye, 1982). Cohen, Kessler, and Gordon (1995) and Hobfoll, Schwarzer, and Chon (1998) have proposed that appraisal of one’s self and the situation are important elements of stress so that stress should be viewed as occurring when individuals perceive environmental demands to tax or exceed their adaptive capacity. The concept of stress as it relates to individuals and work includes the impact of external job demands or personal circumstances (stressors) on an individual’s internal experience (stress response) and the subsequent result of the process (Maslach, 2007).

What is Burnout?

The concept of burnout is considered to be more straightforward than stress because it has an operational definition and a well-accepted measurement tool developed by Maslach and Jackson in 1981.

Freudenberger (1975) and Maslach (Maslach & Jackson, 1981; Maslach, 2007) noted that in human services occupations, including healthcare, the emotional and interpersonal stressors of the job rise from the fact that the relationship between the provider and the patient or client is central to the work and the provision of care is often a highly

emotional experience. Conceptualized as an individual stress experience embedded in the context of relationships, Maslach defined burnout as, “a psychological syndrome in response to chronic interpersonal stressors on the job” (Maslach, Schaufeli & Letier, 2001). The syndrome is comprised of three components: emotional exhaustion (EE), depersonalization (DP) and personal accomplishment (PA) which can be measured using the Maslach Burnout Inventory-Health Services Survey (MBI-HSS) (Maslach & Jackson, 1996). As the MBI-HSS produces three sub-scale scores and no composite score, Maslach & Jackson (1981, 1996) have defined burnout as having high EE and DP and low PA.

The relationship between stress and burnout. An area of open investigation is the relationship between stress and the experience of burnout. The relationship of burnout to job stress specifically, has been discussed by Maslach and Leiter (2004). They identified six key domains of organizational risk factors for burnout: workload, control, reward, community, fairness and values. Although the first two domains, increased workload and limited control, play critical roles in burnout and are reflected in the demand-control model of job stress (Karasek & Theorell, 1990). Maslach and Leiter (2004)

suggest that reward, community and fairness are important factors for predicting all three dimensions of burnout.

Personal variables as risk factors for burnout have not been as widely investigated as have organizational variables (Maslach & Leiter, 2004). Leiter (1989) has suggested that the relational concept of stress described by Lazarus and Folkman (1986) can provide a useful framework for understanding the burnout process. From their stress-strain-coping model (Lazarus & Folkman, 1986), EE can be linked to tension, physical fatigue and insomnia (Maslach & Jackson, 1981) and thus, corresponds with the notion of strain. DP has been viewed as a reactive and protective action consistent with a coping strategy used to escape psychological strain (Kahill, 1988; Lee & Ashforth, 1990; Maslach & Jackson, 1982). PA has been thought to reflect, to some degree, self-efficacy and is linked to the desire to have control in demanding situations. When an individual no longer feels capable of achieving desired goals, PA plummets, giving rise to a negative outcome of the stress-strain-coping sequence (Lee & Ashforth, 1990; Leiter, 1989).

Prevalence of stress and burnout. The investigation of stress and burnout in medicine and nursing has had a long history and much is known about the percentages of physicians and nurses who

experience burnout across a wide range of practice settings (Becker, Milad & Klock 2006; Keller & Koenig, 1989; Malach-Pines, 2000; Maslach & Jackson, 1981; McManus, Winder & Gordon, 2002; Melchior, Bours & Schmitz, 1997). Shanafelt and colleagues (2009) found 32% of American surgeons to have high EE and 26% reported feelings of cynicism and depersonalization. In hospital based nurses, high EE ranged from 34% - 55% (Aiken, Clarke, Sloane, 2002; Neff, Cimiotti, Heusinger & Aiken, 2011) Factors associated with stress and burnout in nursing and medicine have also been investigated from individual and work environment perspectives. (Aiken, et al, 2002; Melchior, et al, 1997; McHugh, et al, 2011; McManus, Keeling & Paice, 2004; Poncet, et al, 2007; Neff, et al, 2011; Ramierez, Graham, Richards, Cull & Gregory, 1996; Shanafelt, et al, 2009; Sharma, Sharp, Walker & Monson, 2008).

Studies of stress and burnout in physical rehabilitation professionals such as physical and occupational therapists however, have been limited. Researchers have investigated rates and associated factors of burnout in occupational therapists (OTs) (Balogun, Titiloye, Balogun, Oyeyemi, & Katz, 2002; Brollier, Bender, Cyranowski & Velletri, 1987; Brown & Pranger, 1992; Lloyd & King, 2004; Rogers & Dodson, 1988; Schlenz, Guthrie & Dudgeon, 1995; Sturgess & Poulsen, 1983) and have found levels of burnout experienced by OTs to be lower

than comparable occupational groups. Few papers however, have included data about burnout rates and associated factors in physical therapists. (Deckard & Present, 1989; Donohoe, Nawawi, Wilker, Schindler, Jette, 1993; Schuster, Nelson & Quisling, 1984; Wandling & Smith, 1997). In the studies that have included a standardized tool to measure burnout, physical therapists have been found to experience high rates of EE whereas feelings of cynicism and DP have ranged from low to high and feelings of PA varied widely across the studies. The factors associated with burnout in PTs included role conflict, limited communication/connectedness, and too many meetings and are similar to the factors identified in nursing and medicine, but have not been fully explored. Concerns associated with burnout in nursing and medicine, such as illness of the health care provider, attrition and compromised patient care have not been investigated in physical therapy.

Another factor that limits current knowledge about the incidence and impact of burnout in the practice of physical therapy is the fact the studies were published 12 to 28 years ago. Since that time, much has changed in the provision of health care services. Health maintenance organizations (HMO), preferred provider organizations (PPO), diagnostic related groups (DRG), and changing Medicare and Medicaid regulations have influenced the practice, documentation and fee schedule of medicine and rehabilitation. Within the profession of

physical therapy, two additional changes have occurred. Over the past 20 years consumers in all states have been given the right to access physical therapy services without needing a referral from a physician. In addition, the educational requirements for licensure have changed from a bachelor's degree to a master's degree to a doctoral degree. The last masters prepared class will graduate by 2017, and thereafter, all CAPTE accredited programs will grant doctoral degrees of physical therapy (DPT).

Primary Research Question and Hypothesis

Investigations of burnout in PTs are limited and outdated. Given the change in physical therapy education and consumer access to physical therapy services findings from earlier studies may not accurately reflect the current experience of burnout in PTs. The purpose and aim of this dissertation is to determine the prevalence and levels of stress and burnout experienced by PTs in the United States (US). The accepted definition and measurement of burnout includes scores on three separate sub-scales (EE, DP and PA) but does not render one overall burnout score. Rather, burnout is defined as high EE, high DP and low PA (Maslach and Jackson (1981). Thus, my primary research question is "What is the current prevalence of high EE, high DP, low PA and burnout among PTs in the US?" The answer to this question can

help inform the physical therapy profession about its healthcare providers and can assist in setting a direction for future research into the personal and professional characteristics of PTs. My primary hypothesis is that physical therapists will have a prevalence rate of EE, DP, PA and burnout similar to the national normative sample of social service providers, nurses and physicians, because the demands placed on physical therapists are similar to the demands placed on other human and health service providers.

Secondary Research Questions and Hypotheses

Although burnout is often conceptualized within the framework of stress research, burnout is not always the result of high stress levels and the possibility exists that healthcare providers can compartmentalize their feelings of stress. Feeling stressed at home for example, does not always mean that an individual will be stressed at work and vice versa. For the most part, standardized measures of stress have not been used to investigate stress in PTs, so surveying PTs using the Perceived Stress Scale (PSS) will add to the body of knowledge about practicing PTs and whether they report high levels of stress. Thus, my secondary research question will simply be, “What is the level of perceived stress in a national sample of PTs?” Based on the available literature of stress in nursing and medicine, my secondary

hypothesis is that perceived stress scores will be higher in a national sample of PTs compared to a heterogeneous US population.

Investigations of the relationship between burnout and stress in which both experiences have been measured using standardized tools are limited, and no studies have included PTs. Analysis of the relationship between burnout and stress will expand an understanding of burnout and may offer insight for possible interventions. If, for example, there is a strong positive association between stress and burnout or the sub-scales, then interventions which have been demonstrated to be effective for reducing stress may be advised for burnout, high EE, DP and/or low PA as well. If, however, there is no relationship between stress and burnout or its sub-scales then strategies for reducing the level of either experience would likely need to be different. To determine if there is a relationship between a high level of stress and burnout and/or any subscale of burnout I will also be asking the question, “Is a high level of perceived stress associated with the subscales of burnout (EE, DP, PA) or burnout (high EE, high DP and low PA). My hypothesis, based on studies of nurses and physicians, the relational concept of stress (Lazarus & Folkman, 1986) and the stress-response sequence described by Elliott and Eisendorfer (1982), is that high levels of perceived stress will be associated with high EE.

Significance/Need for Study

Stress has been identified as an important risk factor for physical illness and psychological distress. Stress and burnout experienced by nurses and physicians not only negatively affect their own well-being, they are associated with compromised patient care and attrition from health care. Over the past several decades, the nursing and medical professions have routinely invested time and money into the exploration of stress and burnout among their health care providers and have called for educational and institutional changes to address this concern. The work demands placed on PTs are arguably similar to those in nursing and medicine, yet there is a paucity of research into prevalence and effects of stress and burnout in physical therapists. As Americans age and the job growth projection for PTs expands, it will be imperative for the physical therapy profession to have information about stress and burnout among its health care providers. Determining the prevalence of stress and burnout and the association between the two in physical therapists is the first step for determining if in fact these conditions, which are present and detrimental in nursing and medicine, exist in the physical therapy.

Chapter II

REVIEW OF LITERATURE

Introduction

The specific issue to be addressed by a review of the literature was the prevalence of stress and burnout in physical therapists. The review was conducted by searching for articles, books and other resources relevant to the topic of stress and burnout in health care providers. Key words such as “stress”, “burnout”, “physician”, “nurse”, “physical therapist”, and “rehabilitation” were used to search the databases Ovid MEDLINE, CINAHL, and PsycINFO. When warranted, references for the articles found through the search were obtained for review.

In addition to obtaining background and theoretical information about stress and burnout, a focus was placed on literature that included the use of standardized tools for measuring stress and burnout. A review of this literature suggested that the most frequently used tool for measuring stress was the Perceived Stress Scale and the most commonly used tool for measuring burnout was the Maslach Burnout Inventory-Human Services Scale.

Information about physical therapists and the practice of physical therapy was obtained through on-line access of the American Physical Therapy Association and governmental labor websites. A search using Google Scholar was conducted to obtain information about survey research.

Stress

The contemporary concept of stress has evolved over thousands of years. The early Greek philosopher Heraclitus (535-475 BCE) proposed that everything is in perpetual flux and that change is the natural condition of the universe. A few years later Empedocles of Akragas in Sicily (495-435 BCE) influenced medical thinking by postulating a dynamic state of matter and suggesting that all things consist of four material elements (fire, air, earth, water) and two forces (love and strife). Health was described as the harmonious balance of the humors or elements of life. Disease or illness was defined as an imbalance of forces or elements. Hippocrates (460 BC-370 BC), considered to be the father of modern medicine, did not believe that the disharmony of forces, which caused disease derived from supernatural forces. Rather, he assumed all illnesses to have natural causes and that the counterbalancing or adaptive forces of healing were of natural origins as well. During the Renaissance, English physician Thomas Sydenham (1624-1689) revived Hippocratic theories and methods of observations

and advanced the concept of illness as an imbalance of forces. He suggested that a person's adaptive response to such imbalances could itself be capable of creating pathology. In the 19th century, Claude Bernard (1813-1878) a French physiologist, was the first to introduce "milieu interieur", a term used to explain the principle of dynamic internal physiological equilibrium. In his book, *The Wisdom of the Body* (1932), Walter B. Cannon (1871-1945), an American physiologist coined the term "homeostasis" to address the equilibrium described by Bernard and to encompass the ideas and writings of physiologists Eduard Pfluger (1829-1910), Leon Fredericq (1851-1935) and Charles Richet (1850-1935). Cannon wrote, "Organisms, composed of material which is characterized by the utmost inconstancy and unsteadiness, have somehow learned the methods of maintaining constancy and keeping steady in the presence of conditions which might reasonably be expected to prove profoundly disturbing...I have suggested a special designation for these states, homeostasis. The word does not imply something set and immobile, a stagnation. It means a condition which may vary, but which is relatively constant" (Cannon, 1932, p. 24).

Cannon also coined the term "fight or flight" (Cannon, 1915) and is thought to be a pioneer in the field of psychosomatic medicine by connecting the mind and body (Quick & Spielberger, 1994). Through experimentation, Cannon identified the effects of emotional disturbance

on organs and systems including the adrenal medulla and the sympathetic nervous system (Cannon, 1982). The “flight or fight response” prepared the animal or person for escape or defense in the struggle for survival (Cannon, 1915).

In the 1930s, Hans Selye (1907-1982), a Hungarian endocrinologist, borrowed the term “stress” from physics and used it for referring to the physical or psychological demands placed on an individual and the bodily processes created by those conditions (Chrousos & Gold, 1992). Based on his experiments with animals, Selye proposed that all types of stimuli can challenge an organism’s milieu interieur or homeostasis and evoke a response of adaptation mediated by the endocrine system. He defined stress as the “nonspecific result of any demand upon the body, be the effect mental or somatic” (Selye, 1982, p. 7) and conceptualized the physiology of stress as a stereotypical response pattern. He named the agent or demand that evokes a coordinated response the “stressor” and called the manifestation of stress in the body the “General Adaptation Syndrome” (GAS) (Selye, 1956).

Selye described the GAS as proceeding in three stages, the alarm reaction, the stage of resistance, and the exhaustion stage. The alarm reaction consists of an initial shock phase in which the person or animal becomes aware of the stressor (Figure 1). In this phase, blood

pressure drops and there is temporary loss of muscle control which limits the body's ability to deal with the stressor. Quickly however, shock is replaced with countershock and the animal or person becomes highly alert. Heart rate and respiration rate increases as the organism prepare to fight or flee the stressor. If the stressor is not dealt with immediately, individuals enter the stage of resistance. During this stage, symptoms of the alarm reaction abate, which indicates the organisms' adaption to the stressor (Krohne, 2001). During adaptation, processes such as digestion, growth and reproduction slow down to save energy so that more can be directed towards resisting the stressor (Kyrous, Chrousos, and Tsigos, 2006). While resistance to the stressor remains high however, resistance to other stressors decreases. If the aversive stimulus is not eliminated, resistance gives way to the stage of exhaustion. The person or animal's capability of adapting to the stressor is exhausted and the organism becomes highly vulnerable to illness and disease.

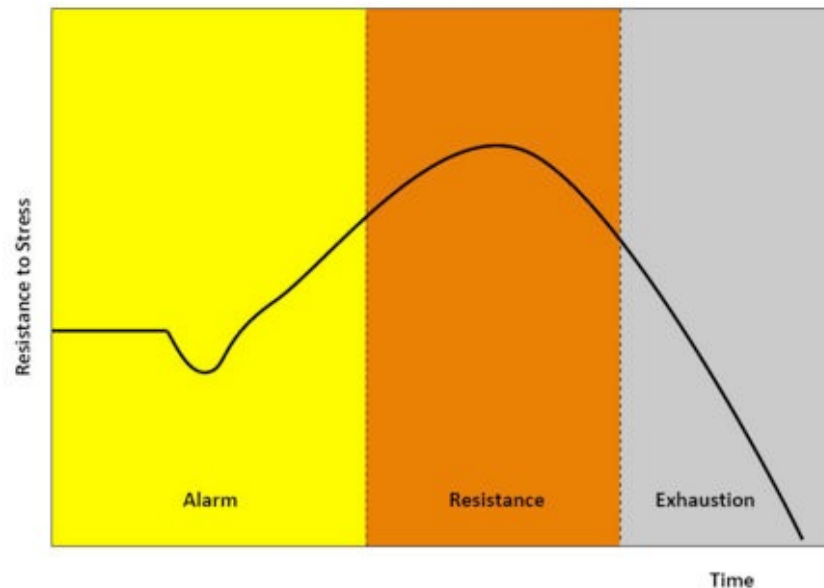


Figure 1. General adaptation syndrome curve as a response to stress. Adapted from Selye, H. (1950). "Stress and the general adaptation syndrome," by H. Selye, 1950, *British Medical Journal*, 1(4667), p.1392.

Selye conducted many animal studies using different types of noxious stimuli and varied the intensity and duration of the stressors. He observed pathologic changes in the cardiovascular, gastrointestinal and musculoskeletal systems and speculated that if stressors and the GAS caused these findings in laboratory animals, stress would likely contribute to the development of pathologic conditions and diseases in humans. Selye (1956) called this "diseases of adaptation".

Given that Selye defined stress as a reaction to any demand, stressors did not need to be noxious or negative to challenge one's

homeostasis. Furthermore, Selye proposed that stressors “are not exclusively physical in nature” (Selye, 1982, p.14). Emotions considered to be positive or negative such as love, hate, joy and rage can initiate changes characteristic of the stress syndrome because regardless of the type of demand, adaptive functions to restore normalcy are required. Selye used the term “eustress” to describe a brief and controllable state of challenged homeostasis perceived as pleasant and “distress” as a physical and/or psychological state perceived as unpleasant (Selye, 1956, 1982).

Selye’s stress theory and the GAS influenced stress research for several decades and over time has been challenged from several fronts. Prior to 1950, the study of endocrine regulation was based on relatively non-specific or indirect measures of glandular weight and histology or the metabolic effects of hormones and so Selye’s research leading to the stress concept was based upon these indirect methods of evaluating pituitary-adrenal function (Mason, 1971). In subsequent decades, techniques such as chromatography, immunoassay and microspectrophotometry made it possible to precisely measure individual hormones in plasma, urine and saliva. Using the newer techniques to evaluate the effects of the diverse stressors suggested by Selye, endocrinologists did confirm that the pituitary adrenal cortical system responds to a wide variety of biological and physical stressors

(Mason, 1971). However, Mason (1971, 1975) has suggested that all of the stressors Selye tested had one thing in common, they were novel, strange and unfamiliar to the organism. Therefore, the animals' states included feelings of uncertainty and helplessness. Consequently, the GAS response that followed might have been a result of the specific emotional impact of the stressor rather than the stressor itself. Mason (1975) demonstrated experimentally that when uncertainty was eliminated in experiments, no GAS was observed. This led to a challenge of the physiological stress investigated by Selye, because the stress experienced by humans is almost always reflective of cognitive mediation (Krohne, 2001). Mason (1971) has argued from a biological view, that there is a big difference between the idea that many diverse stimuli can elicit a non-specific endocrine response and the observation that many diverse stimuli can elicit a non-specific behavioral response. Krohne (2001) has written, "Selye, however, fails to specify those mechanisms that may explain the 'cognitive transformation' of 'objective' noxious events into the subjective experience of being distressed" (p 15165). Nevertheless, the results of much psycho-immunological research have confirmed that emotions can not only elicit a substantial pituitary-adrenal cortical response, psychological stimuli may be among the most potent stimuli that affect the pituitary-adrenal cortical system (Mason, 1971). Therefore, Mason (1971)

argued that the primary mediator underlying the pituitary-adrenal cortical response of Selye's diverse stressors may be the "psychological apparatus involved in emotional or arousal reactions to threatening or unpleasant factors in the life situation as a whole" (p. 329) and that the "stress concept should not be regarded primarily as a physiological concept but rather as a behavioral concept" (p. 331).

Selye's contention that both positive and negative change (eustress and distress) affect organisms' state of homeostasis in similar ways has been questioned by researchers who have examined the impact of positive and negative changes on physical and emotional well-being (Hatch & Dohrenwend, 2007; Vinokur & Selzer, 1975). Undesirable psychosocial events have been more strongly associated with poor physical health than positive events and a higher frequency of negative events within a six or twelve month period has been associated with a higher likelihood of injury, illness, disability or death (Thoits 2010; Hatch & Dohrenwend, 2007; Cohen, Janicki-Devertes & Miller, 2007; Vinokur & Selzer, 1975).

Disagreements about the definition of stress and conceptual issues about the nature of stress have been longstanding. In the biomedical sciences, stress has been studied from the perspective that adverse stimulation will trigger a stress response. In psychology, stress has typically been viewed as an interaction between a person and the

environment. These views or approaches may not however, be mutually exclusive, especially when contemporary disciplines of psychoneuroimmunology and health psychology are considered. Rather than a single view of stress, different ways of conceptualizing stress are likely valid and important for understanding aspects of stress and their influences (Hobfoll, Schwarzer & Chon, 1998).

Theories of stress. Stimulus-response (S-R) theories of stress are based on observations that certain stimuli produce responses indicative of distress in the organism (Hobfoll et al, 1998, Elliott, & Eisdorfer, 1982, Selye, 1950; 1956; 1974; 1975). Selye defined the stimulus as the “stressor” and the response, “stress”. Similarly, Elliot and Eisdorfer (1982) proposed the stress-response sequence model in which a stressor arises in the environment and provokes a response. They defined stressors as intense or frequent internal or external conditions capable of producing notable physical and psychological reactions. Hobfoll et al. (1998) have suggested that stressors can be “identified as those environmental stimuli that commonly produce psychological or physical distress in the organism” (p.183). The death of a partner, falling off a ladder or losing one’s job are stimuli that would likely meet that criteria, but what is it about those situations that are

stressful? According to Spielberger (1966; 1972) events that threaten an organism's physical or psychological integrity are stressful.

Unlike S-R theories of behavioral psychology, which essentially ignore the characteristics of the organisms, stimulus-response theories of stress have acknowledged the importance of the organisms' characteristics. Hobfoll and colleagues (1998) have suggested that the stimulus-response theory of stress may be best represented as stressor-organism-response (S-o-R) because this designation includes the organism, a critical element in the stress response. It allows for investigations of how and why organisms react differently to the same stressors. The assumption that characteristics or qualities of the organism need to be included to understand the stress response has provided the underpinnings of psychosocial and interactional models of stress.

Kagen and Levi (1975) for example, have suggested that a physiological stress response may be influenced by an individual's genetics and previous experiences so that the stressor and the stress response may need to be examined in the context of a person's predisposition. They identified the need for a better understanding of individual differences of the stress response and established the foundation for interaction models of stress. Lazarus' (1966) theory of stress for example, has undergone several revisions since it was first

proposed (1984, 1991), yet it has retained two central concepts: appraisal and coping. Appraisal refers to an individual's cognitive assessment of a situation and the perceived demands necessary to deal with the situation. Coping is the individual's efforts through thoughts and actions to manage the demands of the situation (Lazarus, 1993). Stress is regarded as a relational concept or transaction between an individual and the environment in which the appraised demands of the situation challenge one's well-being and are greater than the available coping resources (Lazarus & Folkman 1986). Lazarus (1991) has described demands or stressors as having characteristics consistent with uncertainty, novelty, ambiguity and temporal conditions such time constraints. Described in this way, stressors can be either physical or psychological in nature, such that a demanding social event can be perceived as an interpersonal threat and a dangerous environment poses a physical threat. The concept of appraisal is based on emotional and cognitive processes which are dependent on the expectations a person manifests relative to a specific encounter and is important for explaining differences in responses from persons who have been exposed to the same situation or environment (Krohne, 2001).

Lazarus has proposed that appraisal outcomes be categorized as being either a challenge, threat, and, or harm/loss and that each

category has two parts: primary and secondary (Lazarus, 1966; Lazarus & Folkman, 1984). Primary appraisal is considered to be an assessment of the situational demands. A situation is appraised as challenging, for example, if an individual sees the encounter as an opportunity to prove one's skills or achieve personal growth. Threats are experienced when a person anticipates a breach of his or her self-esteem, or perceives physical danger. Harm/loss represents an experience in which some damage has already occurred, such as in the case of a slip in social standing or the compromise of someone or something that was valued (Lazarus & Folkman, 1984; Schwarzer & Taubert, 2002). Primary appraisal also has three components: goal relevance reflects how important the circumstance and the issues surrounding it are to the individual; goal congruence is the extent to which a situation plays out in a manner which is consistent with the individual's goals; and type of ego-involvement which includes personal factors such as ego-identity, self-efficacy and moral values.

Secondary appraisal is considered to be an assessment of resources that can be utilized for handling the demands. Individuals will evaluate their own competence, support systems and other resources believed to be available for meeting the demands of the encounter. Like primary appraisal, secondary appraisal has three components: blame or credit, coping potential, and future expectations. Blame or credit refers

to a person's appraisal of who is responsible for a given situation or event. Coping potential is an individual's assessment of how likely it is that certain behaviors will positively influence the situation. Folkman and Lazarus (1980) have defined coping as "the cognitive and behavioral efforts made to master, tolerate, or reduce external and internal demands and conflicts among them" (p. 223). Coping actions can be utilized to address different aspects of a situation. Problem-focused coping for example is an effort to affect the person-environment relationship. Emotion-focused coping is an attempt to change the appraisal or reduce a negative emotional state (Lazarus, 1991; Krohne, 2001). The last component of secondary appraisal is future expectations, which reflects the appraisal of how the situation will play out with respect to goal congruence.

Although Lazarus (1966) acknowledged resources as a factor in the experience of stress, his emphasis on subjective appraisal rather than on the objective resources left the door open for Hobfoll (1988, 1998) to expand the notion of stress and coping by putting emphasis on the resources as a key element of a stressful situation. He proposed conservation of one's resources as a key motivator in how people behave in a stressful situation and sought to identify the types and availability of resources that can be used to preserve well-being during a stressful encounter (Schwarzer & Taubert, 2002; Krohne, 2001).

Resources can be categorized in one of four ways (Hobfoll, 1988; Hobfoll et al 1998). Object resources include items such as one's home or access to transportation. Employment and personal relationships with others are examples of condition resources. Personal resources include attributes such as self-efficacy and one's skill set, whereas energy resources refer to the means by which one can obtain other resources (e.g. money, knowledge).

Acknowledging that loss of resources is central to his resource theory of stress Hobfoll (1988, 1998) distinguished three categories or contexts in which resources are taxed. An experience can threaten the loss of resources, actually cause a loss of resources, or fail to gain resources. The loss/gain dichotomy advances the notion that a change in resources is stressful and that the interplay of resources is important for understanding reactions to a stressful encounter. For example, Hobfoll et al. (1998) have proposed that resources can act to preserve and protect other resources. A personal resource, such as self-esteem, can enable a person to utilize condition resources, such his or her relationships with other people, to help navigate through a stressful situation. A lack of self-esteem on the other hand, may interfere with accessing condition and energy resources. Failure to gain resources and the frequent or prolonged tapping into ones resources can deplete the resource pool and put one at a disadvantage for combatting further

or near-future stress. Hobfoll et al. (1998) has argued that illness and burnout may be the consequences of such a state and perhaps it is important to consider not only the effect of resources on outcome, but also of outcomes on resources (Krohne, 2001).

The Stress-Response Sequence (SRS) model, described by Elliott and Eisdorfer (1982), is a useful model for appreciating the relationships of stress response variables such as the stressors, environmental factors, individuals' characteristics, resources, and reactions and considers the consequences of responses including physical health and emotional well-being. Elliot and Eisdorfer (1982) divided the stress response into four elements (Figure 2).

Stressors or activators of a stress response, is a term and concept consistent with Selye's definition stressor. In the SRS model however, Elliot and Eisdorfer also consider stressors to be "those internal or external events or conditions that change an individual's present state" (p.20). Reactions are the biological or psychosocial responses of individuals to the stressor, whereas consequences are the sequelae to the reactions, which can also be biological, psychological or sociological in nature.

Consequences also include an evaluative component in which the individual assesses the consequences as being favorable or

unfavorable. Assessment of consequences is not inconsistent with Lazarus' last component of secondary appraisal, except that Elliot and Eisdorfer (1982) have emphasized assessment of the reactions' realized results whereas Lazarus (1993) has focused on the appraisal of how the outcomes might achieve one's goals.

In the SRS model, mediators are conceptualized as the variables that account for the wide range of reactions that can occur even when individuals are exposed to the same stressors (Clarke-Steffen, 2000). Mediators, which may be viewed as similar to the concept of Hobfoll's resources (1988) can be personal or environmental in nature and have the potential to influence the stress response sequence during any point in time.

Additionally, the SRS model suggests that there are mediators in one's personal life, which are different from the mediators present in a work environment, such that biological and psychological reactions to stressors may be different at home compared to work. The SRS model is useful to consider when examining the relationship between stress and burnout.

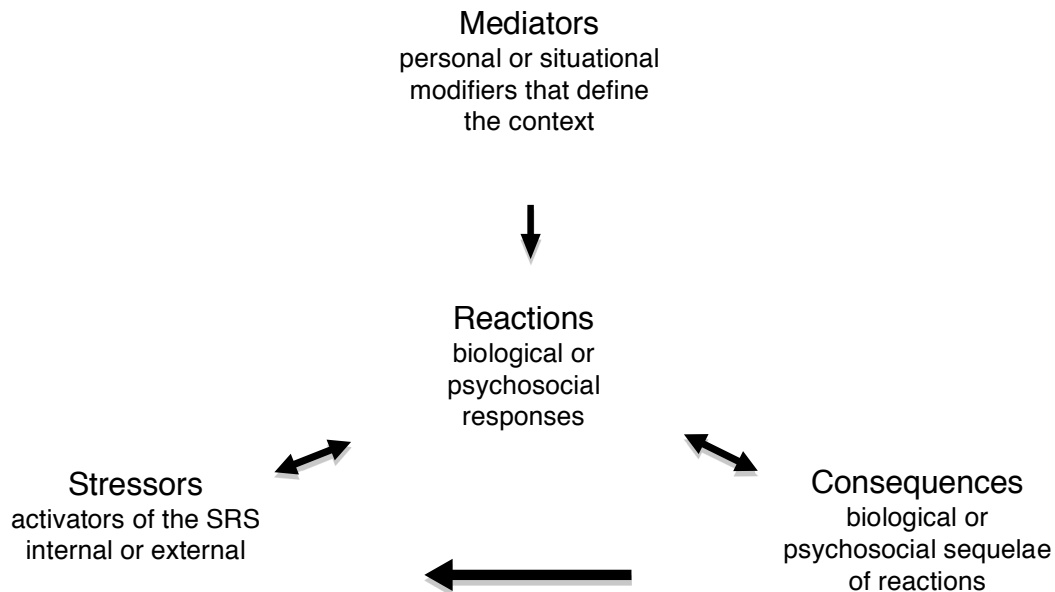


Figure 2. The stress-response sequence model. Adapted from “Stress and human health: Analysis and implications of research: A study”, by G. R. Elliott and C. Eisdorfer, 1982, New York, Springer Publisher Co.

Measuring stress. Cohen, Kamarck and Mermelstein (1983)

developed the Perceived Stress Scale (PSS) in an effort to objectively measure one's perception of stress or, in terms used by Lazarus (1966), the degree to which conditions are appraised as stressful. In developing the PPS, the authors challenged life-event scales (Holmes & Rahe, 1967; Dohrenwend & Dohrenwend, 1974, 1981) used to produce a cumulative stress score by summing the number of events that occurred within a specific period of time or on a sum of weighted events based on the difficulty adjusting to these events. These objective measures of stressful events may be useful for estimating the increased risk of illness based on associations with the occurrences of easily identifying events. However, the use of objective measures of stress

suggests that the events themselves are the precipitating cause of pathology. This implication is inconsistent with explanations of stress as a human experience in which people are affected by life events in dramatically different ways based on individual mediators and appraisals of events relative to perceptions of available resources (Elliot & Eisdorfer, 1982; Clarke-Steffen, 2000; Hobfoll et al., 1998; Lazarus, 1966). Thus, the measurement of stress should not be based solely on the frequency, intensity or any other quality of stressors. Rather, the measurement of stress should include a means to capture personal and contextual factors related to the events likely to evoke stress. Cohen and colleagues have argued that the PSS provides a better predictor of negative outcomes than life-event or objective stressor measures because it provides a more direct measure of the respondents' appraised level of stress and that it is this component of the stress sequence that influences one's response to stressors (Cohen, et al, 1983; Lazarus, 1966). Cohen et al. (1983) have also claimed that PSS is more valuable than life-event scales because it does not tie appraisal to specific situations. Rather, it is sensitive to chronic stress from ongoing life circumstances, events occurring in the lives of friends and family, concerns about the future and reactions to any events (Cohen & Williamson, 1988).

Nevertheless, Cohen and colleagues (1983) have proposed that there may be value in the objective measurement of stressors when it is performed in conjunction with a perceived stress scale. Comparing the predictive validities of objective and subjective measures could assist in understanding the role of appraisal in the relationship between stressors and illness. Perceived stress scales could also be used in conjunction with objective scales to determine if factors such as social support protect people from the negative effects of stressors by altering stressor appraisal or by affecting the process by which appraised stress results in pathology (Cohen et al. 1983). Cohen et al. (1983) have also suggested that the measurement of perceived stress, as a function of objective stressful events, coping processes, personality and other factors, can be a useful outcome variable in wide range of studies of stress and well-being.

The original version of the PSS included fourteen items (PSS14). Respondents were asked to indicate how often they felt or thought a certain way in the last month with the following alternatives: 0 = never, 1 = almost never, 2 = sometimes, 3 = fairly often, 4 = very often. Validation data for the PSS was collected in three samples: 2 cohorts of college students and one group of subjects enrolled in a smoking-cessation program. Mean scores on the PSS14 were 23.18 (SD=7.31) and 23.67 (SD=7.79) in the student samples, and 25.0 (SD=8.00) in the

smoking-cessation group (Cohen et al., 1983). The ranges were 6-50, 5-44, and 7-47, respectively. Although the mean PSS scores for females were higher than the mean scores for males in all three samples, the difference did not approach significance in any sample. Coefficient alpha reliability for the PSS was .84, .85 and .86 in each of the samples and a test-retest correlation of .85 was obtained in a sample of college students who were surveyed twice with 2 days in between. There was a test-retest correlation of .55 in subjects from the smoking cessation program who were retested after 6 weeks (Cohen et al., 1983). The different test-retest correlation values reflect that fact that for state measures, test-retest correlations are typically higher for short retest intervals than for longer ones.

In addition to the PSS, the two cohorts of college students completed a modified version of the College Student Life -Event Scale (Levin & Perkins, 1980) whereas subjects in the smoking cessation group completed the Unpleasant Events Schedule (Lewinsohn & Talkington, 1979). Both the number of events and the event-impact scores were recorded and analyzed. Cohen et al (1983) found small to moderate correlations between the life events scales and the PSS14 in all three samples, with slightly higher correlations when event-impact scores were used. Cohen and colleagues (1983) also found that the PSS was better than the life event measures for predicting physical

symptomatology as measured by the Cohen-Hoberman Inventory of Physical Symptoms (Cohen & Hoberman, 1983) in all the samples. Other investigators have reported that higher PSS14 scores were prospectively associated with failure of persons with diabetes to control blood sugar levels (Frenzel, McCaul, Glasgow & Schafer, 1988), failure to quit smoking (Glasgow, Klesges, Mizes & Pechancek, 1985) and greater vulnerability to depressive symptoms (Kuiper, Olinger & Lyons, 1986).

Cohen & Williamson (1988) have acknowledged that it may be difficult to distinguish between perceived stress and psychological distress, because feelings of stress and overload are often viewed as symptomatic of psychological disorder. They suggest however, that perceived stress as measured by the PSS14 is not simply a measure of psychological symptomatology because the PSS includes items regarding perceived control over external demands, which are not typically included in scales of psychological disorder. Furthermore, Cohen & Williamson (1988) argue that psychological distress scales assess a broad range of symptoms such as hostility, diminished self-esteem and psychosomatic complaints which are not assessed by the PSS14 and have noted that situations can be appraised as stressful without resulting in these various psychological symptoms. This finding has been observed in studies in which “concurrently assessed

symptomatology was parceled out of the relation between the PSS and various outcomes” (Cohen & Williamson, 1988, p. 36). In 1983, Cohen and colleagues determined that the PSS14 and the Center for Epidemiologic Studies Depression Scale (CES-D) predicted physical symptomatology independently. Cohen (1986) later found that the PSS14 predicts both physical symptoms and smoking cessation after controlling for the influence of psychological distress. Additional investigations (Cohen, Mermelstein, Kamark & Hoberman, 1985; Cohen, Sherrod & Clark, 1986) have also supported the independence of the PSS and psychological distress from data that demonstrates that the association between PSS scores and psychological disorders is moderated by other variables such as social support. The PSS14 has been demonstrated to be a valid tool for measuring perceived stress and it appears to be appropriate for investigating conditions such as job burnout which may be influenced by stress appraisal.

Since the development of the original 14-item PSS, 10-item (PSS10) and 4-item (PSS4) versions of the scale have been published. The PSS10 was derived by dropping the four items with relatively low factor loadings (items 4, 5, 12, and 13) (Cohen & Williamson, 1988). The remaining 10 items (1-3, 6-11 and 14) of the original PSS were submitted to factor analysis. In the principal components analysis of the 10-item scale, all items loaded positively on the first factor at .42 or

above. Additionally, two factors emerged with eigenvalues over 1.0 (3.4 and 1.4, respectively), composed of negatively and positively worded items (Cohen & Williamson, 1988). Deletion of the four items (4, 5, 12, and 13) resulted in a minor improvement in the total explained variance (48.9%) and internal reliability (alpha coefficient = .78). This was demonstrated using a large sample size telephone survey ($N=2,237$) conducted by Louis Harris and Associates, Inc. in 1983, in which Cohen & Williamson (1988) compared the psychometric qualities of the PSS 14 & PSS10. Their observations, along with those of Lee (2012), have led to the recommendation that the PSS10 be used for research purposes (Appendix A).

In 2006 and 2009, eNation conducted large on-line surveys using the PSS10. Both surveys included 2,000 adults and each sample consisted of individuals selected from Synovate's online consumer opinion panel. Based on the 2000 United States Census the samples were balanced to be representative of the general population based on geographic region, gender, age and household income (Cohen & Janicki-Deverts, 2012). The mean PSS10 scores can be found in Appendix B.

According to Cohen & Janicki-Deverts (2012) the distributions of stress are consistent across the three surveys, with women reporting greater stress than men. Stress was found to decrease with age,

education and income. Retired people reported the lowest level of stress in the employment category in all three surveys.

In addition to using the PSS for measuring perceived stress in large samples of Americans, the PSS has been translated into many languages and has been used to measure stress in many different cohorts. Researchers have investigated perceived stress using the PSS in a variety of health care providers, including medical residents and students (Reed, et al., 2011; Waldman, Diez, Arazi, Linetsky, Guinjoan, & Grancelli, 2009), nurses (Cuneo et al., 2011; Purcell, Kutash, & Cobb, 2011), and physicians (Sood, Prasad, Schroeder, & Varkey, 2011; Menon, Munalula, and Glazebrook, 2007; Morais, Maia, Azevedo, Amaral, & Tavares, 2006; Williams, et al., 2001). The PSS has been used to measure stress in health care students other than physicians, including nursing, audiology and physician assistant students (Hernandez, Blavo, Hardigan, Perex, & Hage, 2010) however, physical and occupational therapy students were not included in that study. From a review of the PSS literature, it does not appear that there are published studies of perceived stress in physical therapists.

Burnout

Although many people interchange the term burnout with stress, the two words are not synonymous. In the middle 1970s, articles were

written about a phenomenon called burnout, which was based on the experience of people working in human services and health care occupations (Maslach, Schaufeli, & Leiter, 2001). Freudenberger (1975) described his observations of professionals whose responsibility it was to recognize and respond to the needs of people in crisis or some type of stressful situation. In particular, he observed individuals who worked in settings such as crisis intervention centers, methadone clinics, gay or draft counseling centers and runaway houses, or who provided services through hot lines or support groups (Freudenberger, 1975). He characterized those people as dedicated and committed professionals who often accepted personal satisfaction from their work as compensation for working long hours and barely adequate financial compensation. Freudenberger (1975) then identified three different job related pressures that appeared to contribute to professional burnout. The first pressure came from the people themselves through an intrinsic desire to accomplish success. The second pressure came from the desperate needs of the clients who the professionals served. The two pressures were then compounded by a clinic or program administrator to either see more clients or achieve greater success, thus creating “ a three-way squeeze (that) will come down with a three-level burnout” (Freudenberger, 1975, p.74). These pressures, according to Freudenberger (1975), push dedicated professionals to work harder, yet

as they give more effort to their work, they become frustrated and exhausted. This leads to emotional depletion, cynicism in outlook and behavior, and a loss of motivation and commitment, which leads to shortfalls in effectiveness and accomplishments.

Maslach (1976) also sought to describe the burnout phenomenon and interviewed a wide range of human services workers about the emotional stress of their jobs. These interviews included consistent reports that professional-client interactions were centered around the clients' problems, which could be psychological, social and/or physical in nature, and that dealing with feelings of fear, anger, despair and embarrassment was common. The interviews also revealed themes consistent with Freudenberger's (1975) observations. First, the rendering of care or service to clients in need can be very demanding, and feelings of emotional exhaustion are a common response. Second, some service providers attempted to establish emotional distance from their work as a way to protect themselves from intense emotional distress. This detachment may have managed emotional exhaustion in the short term, but resulted in behaviors that suggested depersonalization or cynicism towards clients. Along with these feelings and emotions human services workers were found to have a compromised sense of professional value and accomplishment.

Measuring burnout. The work on burnout shifted in the 1980s from interviews and field observations to systematic empirical research (Maslach, Schaufeli, & Leiter, 2001). Of particular interest was the assessment and measurement of burnout. In response, Maslach and Jackson (1981) developed the Maslach Burnout Inventory-Human Services Survey (MBI-HSS) based on a multidimensional theory of burnout. Maslach and Jackson (1981) hypothesized that burnout is a complex psychological syndrome, comprised of three dimensions. The first dimension, emotional exhaustion (EE), refers to the depletion of peoples' emotional resources. It can also include feelings that one no longer has the ability to psychologically support his or her clients (Maslach & Florian, 1988). Of the three dimensions, EE reflects the stress component of burnout and the psychological and physiological state of the professional (Taris et al., 2005). EE is the most widely reported and analyzed dimension of burnout, even though Maslach, Schaufeli, and Leiter (2001) suggest that exhaustion does not "capture the critical aspects of the relationship people have with their work" (p. 403). The dimensions of depersonalization (DP) and personal accomplishment (PA) are necessary for understanding the burnout phenomenon, because they reflect the relationship individuals have with work (Maslach, Schaufeli, & Leiter, 2001; Taris, et al., 2005).

Besides the actual experience of feeling exhausted, which limits one's capacity to be committed and responsive to the clients' needs, exhaustion may prompt people to distance themselves from their work in an effort to cope with work demands. This strategy is reflected in the second dimension DP, which includes feelings of detachment and negative attitudes towards clients, frequently leading to objectifying the client as a "case" or "file number". Although developing a sense of "detached concern" (Lief & Fox, 1963) may be one way of protecting oneself from intense emotional distress, it can be characterized as dysfunctional coping because the behavior of detachment includes responding to clients in negative, callous, cynical and depersonalized ways (Hatinen, Kinnunen, Pekkonen, & Aro, 2004; Taris, LeBlanc, Schaufeli, & Schreurs, 2005; Leiter & Schaufeli, 1996). Viewing clients with negative attitudes can compromise decision-making and care while cynicism has led providers to think that their clients somehow deserve their troubles, causing interference with the provision of effective services (Wills, 1978).

The third dimension of burnout is PA. Social service and health care providers with low PA feel dissatisfied with their work and pessimistic about their professional goals (Maslach & Jackson, 1981). They tend to evaluate themselves negatively, which may include feelings of incompetence and low self-efficacy.

Items for the MBI-HSS were designed to measure the three components of burnout syndrome. According to Maslach & Jackson (1981), several established scales of job stress and job satisfaction were reviewed for content material, interview and questionnaire qualities. In addition, data collected through interviews, surveys and field observations of workers from a wide variety of human services professions including health care, social services, mental health care and criminal justice provided information about the attitudes and feelings that characterize burned-out professionals (Maslach, 1976; Maslach, 1978; Pines & Maslach, 1978). This knowledge informed the development of forty-seven items that were included in a preliminary form of the MBI-HSS, which was administered to six hundred five people from a variety of health and human service occupations (Maslach, Jackson & Leiter, 1997). The data from this sample underwent factor analysis and ten factors were found to account for over three fourths of the variance. A set of selection criteria was then applied to the items, which yielded a reduction in the number of items from forty-seven to twenty-five (Maslach, et al., 1997).

The 25-item form was then administered to a new sample of health & service professionals. Results of the factor analysis of the second data set were similar to the first, so the two samples were

combined. Factor analysis of the twenty-five items from the combined samples yielded three factors with eigenvalues greater than unity and were identified as the subscales of the MBI: emotional exhaustion, depersonalization, and personal accomplishment. The three subscales of EE, DP and PA included nine, five and eight items respectively.

Reliability coefficients for the MBI-HSS were determined on samples not included in the item selection process. Internal consistency was estimated by Cronbach's coefficient alpha ($N=1,316$). The reliability coefficients for the subscales were the following: .90 ($SE=3.80$) for EE, .79 ($SE=3.16$) for DP, and .71 ($SE=3.73$) for PA (Maslach, Jackson & Leiter, 1997). Data on test-retest reliability of the MBI-HSS were reported for 2 samples. In one sample, the test sessions were separated by 2-4 weeks. The test-retest reliability coefficients for the subscales were: .82 for EE, .64 for DP and .80 for PA (Maslach & Jackson, 1981). In a different sample, testing was separated by a year interval. The test-retest reliabilities were: .60 for EE, .54 for D and .57 for PA (Maslach, Jackson & Leiter, 1997). Subsequent studies have found the MBI subscales to be stable over time, with correlations in the .50-.82 range on time spans of three months to one year (Maslach et al., 1997). Convergent validity was demonstrated in three ways: 1) A person's MBI-HSS scores were correlated with behavioral ratings made independently by an individual who knew the person very well (Jackson

& Maslach, 1982); 2) MBI-HSS scores were correlated to job characteristics known to contribute to burnout (Maslach & Jackson, 1984); and 3) MBI-HSS scores were correlated with measures of various outcomes hypothesized to be related to burnout (Maslach et al., 1997). Discriminant validity was demonstrated through a comparison of subjects' scores on the MBI-HSS and Job Diagnostic Survey (JDS), a measure of general job satisfaction. Job satisfaction had a modest inverse correlation with both EE ($r = -0.23$, $p < 0.05$) and DP ($r = -.22$, $p < 0.02$), and a modest correlation with PA ($r = 0.17$, $p < 0.06$) (Maslach et al., 1997). According to the authors, since less than 6% of the variance was accounted for by any one of these correlations, one can reject the notion that burnout is simply a synonym for job dissatisfaction.

In a study to examine the reliability & validity of the MBI-HSS in a cohort of four hundred sixty-nine teachers, Iwanicki & Schwab (1981) omitted the three items related to involvement, but used the two frequency and intensity scales. Using the same form of factor analysis as Maslach and Jackson (1981), Iwanicki and Schwab (1981) also identified the factors of EE, DP and PA. In addition, they found a high relationship between the sub-scale scores on the frequency & intensity dimensions and suggested that time to administer the tool could be reduced by eliminating either the frequency or intensity rating. In a different study of burnout in teachers, Belcastro & Gold (1983) also

omitted the involvement sub-scale. In the second edition of the MBI-HSS the involvement sub-scale and the intensity rating were eliminated (Maslach & Jackson, 1986). After the second edition of the MBI-HSS was published, Green and Walkey (1988) performed principal components analysis followed by three- and four-factor varimax rotations on previously published data in an effort to assess the MBI-HSS' factor structure. The authors concluded that the MBI-HSS is a questionnaire with a consistently replicable three-factor structure that measures the three sub-scales of burnout (Green & Walkey, 1988).

The MBI-HSS, the most widely used instrument to evaluate burnout (Worley, Vassar, Wheeler, & Barnes, 2008) is a self-administered survey of twenty-two items, divided into three subscales: EE, DP and PA. The items are written in the form of statements about personal feelings or attitudes (e.g. "I don't really care what happens to some recipients"). The term "recipients" is used to refer to the clients or patients who receive care from the service provider or "respondent". The response to each item is in terms of frequency ranging from "never" to "everyday". A seven-point Likert scale is used: never (=0), a few times a year or less (=1), once a month or less (=2), a few times a month (=3), once a week (=4), a few times a week (=5), and every day (=6) (Maslach, Jackson, Leiter, 1996). The MBI-HSS takes less than ten minutes to complete and can be found in Appendix C.

From a multidimensional theory of burnout, Maslach & Jackson (1986) conceptualized burnout as a continuous variable ranging from low to average to high degrees of experienced feelings and therefore “is not viewed as a dichotomous variable, which is either present or absent” (Maslach & Jackson, 1986, p.5). Across each sub-scale, scores are considered high if they are in the upper third of the normative distribution, average if they are in the middle third, and low if they are in lower third (Maslach & Jackson, 1986). The cut-off scores for each third of the entire sample are shown in Table 1. Burnout is defined as high scores in EE & DP and a low score on the PA sub-scale. Average scores on the three sub-scales indicate an average degree of burnout, whereas a low degree of burnout is reflected by low scores on the EE & DP sub-scales and a high score in PA. The demographic norms for health care and social service providers for the MBI-HSS sub-scales can be found in Appendix D.

Table 1

Subscales and Classification of Scores for Determining Burnout

Burnout subscales	Low	Average	High
Emotional Exhaustion (EE)	≤ 16	17 - 26	≥ 27
Depersonalization (DP)	≤ 6	7 - 12	≥ 13
Personal Accomplishment (PA)	≤ 31	32 - 38	≥ 39

Note. Low, average and high scores from "The measurement of experienced burnout," by C. Maslach and S. E. Jackson, 1981, *Journal of Occupational Behavior*, 2, pp. 99-113.

Development of burnout. Whether EE, DP, and PA are co-existing conditions or are linked by a causal process has been a disputed issue, and researchers who have investigated causal links have proposed different models (Golembiewski & Munzenrider, 1988; Lee & Ashforth, 1993; Leiter & Maslach, 1988; Onder & Basim, 2008; Taris, LeBlanc, Schaufeli & Schreurs, 2005). The sequence of burnout proposed by Leiter & Maslach (1988) is that EE occurs before DP because an exhausted, emotionally drained professional no longer has the capacity to be empathic and caring toward clients or patients. After a cynical attitude and a sense of detachment develops, the professional's performance will decline and he or she will feel less effective at work, which results in diminished feelings of PA. This sequence or model has been supported by Cordes and colleagues (1997) who studied burnout in human resource professionals.

Golembiewski, Munzenrider, and Stevenson (1986) proposed a different model suggesting that DP is the first component of burnout to be experienced, followed by feelings of low PA, which then leads to EE. Both Leiter and Maslach (1988) and Golembiewski et al (1986) have suggested that some degree of detachment is often, and sometimes a necessary, coping strategy that allows the professional to remain functional and productive. Beyond a certain degree however, detachment becomes DP, which compromises the quality and effectiveness of relationships, thereby negatively affecting one's sense of accomplishment. Hence, Leiter and Maslach (1988) and Golembiewski et al. (1986) agree that PA follows DP, but Leiter and Maslach (1988) believe the path to burnout begins with EE, whereas Golembiewski et al. (1986) consider EE to be the final stage of burnout. The model of burnout proposed by Golembiewski et al. (1986) (DP > PA > EE) was not supported however in the studies conducted by de Vries (2001) and van Dierendonck, Schaufeli, and Buunk, 2001. In these studies, the data suggested a sequence of burnout initiated by low PA. de Vries (2001) found that following low PA, high EE would be observed, followed by DP. Alternately, van Dierendonck et al. (2001) noted that low PA gave way to high DP and then high EE. The studies conducted to investigate the sequence of burnout have used cross-sectional designs, a method that can be used to investigate the

chronological order of sub-scales through structural equation modeling. However, a longitudinal design is often the preferred method to note chronology and causality, and is useful for ruling out the reverse causation possibility. Lee and Ashforth (1993) and Te Brake, Smit, Wicherts, Gorter, and Hoogstraten (2008) both conducted longitudinal studies to investigate the sequence of experiences leading to burnout.

Lee and Ashforth (1993) compared the models of Leiter and Maslach (1988) and Golembiewski et al. (1986) in a study of human service supervisors and managers and found the Leiter and Maslach (1988) model to be the most accurate. Based on a post hoc analysis, Lee and Ashforth (1993) then suggested a revised Leiter and Maslach model in which high EE leads directly to both high DP and low PA. The authors did point up, however, that PA was found to only be weakly related to EE and DP and that EE appeared to play the most critical role in the experience burnout. Furthermore, they suggested that PA may be affected by a variety of work factors (e.g., performance-contingent rewards, task characteristics) such that the impact of EE and DP is somewhat attenuated (Lee & Ashforth, 1993).

In the other longitudinal study Te Brake, Smit, Wicherts, Gorter, and Hoogstraten (2008) investigated the sequence of burnout in dentists. Through structural equation modeling they found that the models proposed by Maslach and Jackson (1981) and de Vries (2001)

had a good fit on the data. Of the two models, a slight preference was noted for the sequence of PA, then EE, followed by DP. A summary of the burnout model and progression studies can be found in Table 2.

Table 2

Proposed Models of the Chronologic Sequence of Burnout

Author	Sequence of burnout
Leiter (1988)	EE > DP > PA
Golembiewsky (1986)	DP > PA > EE
Van Dierendonck (2001)	PA > DP > EE
De Vries (2001)	PA > EE > DP
Lee (1993)	EE > DP EE > PA
Te Brake (2008)	PA > EE > DP

Note. EE = emotional exhaustion; DP = depersonalization; PA = personal accomplishment.

Physical Therapists

PTs are required to be licensed in all 50 states, the District of Columbia, Puerto Rico and the American Virgin Islands and must practice within the scope of physical therapy practice defined by licensure laws reflected in each entity's physical therapy practice act. Most jurisdictions have an independent state board of physical therapy, although some have a physical therapy board that is combined with other professions. Other jurisdictions may have a "super board" where all regulatory activities are subordinate to one board. What constitutes

practice within the scope of physical therapy is largely the responsibility of the licensing board in each state or jurisdiction. Because the scope of PT practice may change as contemporary medical and rehabilitation practice evolves, boards may be called upon to consider the appropriateness of physical therapy procedures as they relate to established practice acts and evolving scopes of practice. Interpretations and decisions made in one state may not be reflected in physical therapy practice acts in other states.

Although PTs are licensed in all 53 jurisdictions, and the Federation of State Boards of Physical Therapy (FSBPT) provides a website directory of state boards there is no central database of licensed PTs that includes home address, e-mail address or telephone number, making it essentially impossible for a nationwide survey of all licensed PTs to be conducted. The American Physical Therapy Association (APTA), however, is a professional organization that does have a directory of its members. The APTA, which seeks to improve the health and quality of life of individuals in society by advancing physical therapy, education, and research, represents more than 88,000 PTs, physical therapist assistants (PTAs), and students of physical therapy. Of the 88,000 members, 58,777 are PT members. Membership is voluntary and is renewed yearly through a combination of State and

National dues (American Physical Therapy Association, About Us, on the internet at www.apta.org/AboutUs visited on August 22, 2014).

Although the APTA maintains a membership roster and database of personal information, its policy, “BOD Y11-03-08-25 Dissemination of Member Electronic Mail Addresses” prohibits the distribution of e-mail addresses to individuals or external organizations. Individual APTA members can however, select to share their personal information, including their e-mail address, with other members of the APTA. Access to member e-mail addresses can be achieved by selecting a member’s name from the on-line member directory to see if an e-mail address is listed. If an e-mail address is listed, then it signifies that he PT has agreed to be contacted via e-mail.

Burnout in physical therapists. The MBI-HSS has been used to measure burnout worldwide in several different groups of health care professionals including medical students, physicians, nurses, mental health counselors, psychologists, occupational therapists and physical therapists. The available published literature of burnout in physical therapists, however, consists of only three studies (Deckard & Present, 1989; Donohoe, Nawawi, Wilker, Schindler, Jette, 1993; Wandling & Smith, 1997). Two additional studies of burnout in PTs also included occupational therapists (OTs) in the samples (Balogun, Titiloye,

Balogun, Oyeyemi, & Katz, 2002; Schlenz, Guthrie, & Dudgeon, 1995).

A summary of the results pertaining to burnout in PTs is presented in

Table 3.

Table 3

Summary of Mean Scores of Burnout Subscales and Percentages of High Emotional Exhaustion, High Depersonalization and Low Personal in Physical Therapists

Citation	Emotional Exhaustion		Depersonalization		Personal Accomplishment	
	% with high score	Mean (SD)	% with high score	Mean (SD)	% with low score	Mean (SD)
Deckard (1989) <i>N</i> = 187	NR		NR		NR	
Donohoe (1993) <i>N</i> = 123	46%	23.5 (10.7)	21%	7.6 (5.8)	60%	37.3 (8.5)
Schlenz (1995) <i>N</i> = 40	43%	25.4 (9.4)	10%	6.4 (3.7)	5%	39.4 (4.7)
Wandling (1997) <i>N</i> = 387	NR	18.7 (9.3)	NR	5.4 (4.4)	NR	41.8 (5.0)
Balogun (2002) <i>N</i> = 307	58%	28.8 (7.4)	94%	18.4 (4.7)	97%	18.0 (6.1)

Note. High emotional exhaustion ≥ 27 ; high depersonalization ≥ 13 ; low personal accomplishment ≤ 31 from "The measurement of experienced burnout," by C. Maslach and S. E. Jackson, 1981, *Journal of Occupational Behavior*, 2, pp. 99-113. NR= not reported.

In the oldest paper, Deckard and Present (1989) surveyed one hundred eighty-seven PTs practicing in Missouri, using the MBI-HSS, the Anxiety-Stress Questionnaire and role ambiguity and role conflict scales. The researchers hypothesized that PTs who report high levels of role conflict and ambiguity would also report emotional exhaustion, depersonalization of patients, low levels of personal accomplishment and the existence of job-induced and somatic tension. Analysis of demographic information about the PTs revealed an average age of 32 years and 9.1 years working as a PT with an average 3.8 years in their current position. Sixty percent worked in a non-profit hospital, 11% worked in a for-profit hospital, 10% worked in private practice, 9% working in a rehabilitation facility, 6% worked in home care, and 4% worked in long-term care. The authors reported the results of their analysis-of-variance and correlational analysis, but did not provide the mean scores for any of the survey tools. Analysis-of-variance did not reveal any significant differences in the EE, DP, PA, job-induced and somatic tension scores based on any personal or professional characteristics. Analysis of the role conflict and ambiguity scores demonstrated one significant difference. PTs who practiced in long-term care settings reported significantly lower scores on role ambiguity than therapists who practice in other settings. Correlational analysis

demonstrated that role conflict and ambiguity were significantly associated with EE, DP, and somatic & job-induced tension. The researchers also reported that stepwise multiple regression analyses provided identification of specific role stress items which are statistically significant predictors of emotional well-being as measured by EE, DP, and PA and physical well-being as measured by somatic & job-induced tension. The primary key role stressor (from the role ambiguity scale), which predicted all three dimensions of burnout, was the perception that one's time is not allocated properly. Other predictors (from the role conflict scale) included inadequate staff or resources and conflicts between groups. Somatic tension and job-induced tension were also predicted by inadequate staff or resources. Somatic tension was further predicted by clarity in role and responsibilities; whereas job-induced tension was significantly influenced by feelings that one's time is not properly allocated. Based on their observations, Deckard and Present (1989) suggested that chronic conditions of inadequate staff or resources, improper allocation of time, and incompatible demands can give rise to the depletion of therapists' emotional and physical energy. This in turn, can lead PTs to become less sensitive to their patients' needs, less willing to accept new patients, and overtime, and less able to effectively manage an average caseload. Recommendations for promoting emotional and physical well-being of PTs were focused on

organization-based strategies including involving staff PTs in the development of organizational policies, offering “office days” for PTs to catch up on paperwork and continuing education, and group meetings to discuss causes of stress, coping strategies and other concerns. Deckard and Present (1989) did not offer any person-focused strategies for promoting emotional and physical well-being, but did suggest that the investigating the impact of role conflict and ambiguity on performance and patient care may be warranted.

In a survey of staff physical therapists working in rehabilitation hospitals in Massachusetts, Donohoe et al. (1993) sought to determine factors associated with burnout using the MBI-HSS and questions “designed to address attributes of the work environment and individual personalities” (p. 750). The MBI-HSS scores were calculated for each of the 123 PTs and were categorized as high, average or low for each sub-scale using the cut-off scores established by Maslach and Jackson (1981). Multi-variate analyses were conducted to determine the contribution of work issues, personality and demographics to the three sub-scales of burnout. The median age of the subjects was 26 years, and 63% had three years or less experience. Seventy-nine percent of the sample were in their current position for three or less years. The researchers found that 46% and 20% of the PTs scored high on the EE & DP sub-scales, respectively. Sixty percent of the sample scored low

on PA. From the factor analysis of the work environment and personality questions, three factors emerged. The authors referred to them as communication/connectedness, achievement, and time constraints. Regression analysis showed that all three factors were significant predictors of EE and accounted for 69% of the variability. The communication/connectedness and achievement factors were also significant predictors of DP and negative predictors of PA. The models accounted for 73% of the variability in scores for each sub-scale. Donohoe et al (1993) explained that a sense of professional sharing at work and having someone with whom to share work-related problems were components of communication/connectedness and suggested that items contributing to communication/connectedness and achievement reflected both personality and environmental issues, whereas time constraints reflected only the work environment. Although it is unclear if the data supports these suggestions, the authors recommended that measures to prevent burnout should focus on self-awareness to improve an individual's ability to recognize the possible interactions of personality traits with the environment that would make him or her susceptible to burnout. In addition, an effort should be made to make the job more challenging and less routine and to provide resources for better time management and continuing education (Donohoe et al., 1993).

Wandling and Smith (1997) sought to determine if orthopedic physical therapists in the east north central region of the United States experienced burnout and if burnout scores were related to selected variables. The researchers surveyed three hundred eighty-seven PTs using the MBI-HSS and obtained personal and work -related demographic information such as gender, number of years as a physical therapist and work setting. The authors reported the mean scores for the three MBI-HSS sub-scales, but did not categorize the number or percentage of the sample as having low, moderate or high scores in EE, DP, or PA. No significant difference was found between males and females on any of the sub-scales and so all the respondents were considered as one group. When the categories of low, average and high from Maslach and Jackson (1981) were used, all age groups were found to have low mean scores on the DP and PA sub-scales. The 34.1- 41-year-old age group also had a low mean score on EE sub-scale. All the other age groups had mean EE scores considered to be average. The sample had an average of 11.37 years in the physical therapy profession with a range of 0.3-37.0 years. The number of years was divided into quartiles for analysis and for all quartiles the mean scores DP and PA were low. Mean scores for the EE fell into the average category for all quartiles except for respondents who had been in practice for more than sixteen years. They demonstrated a low mean

score for EE. With respect to work setting, orthopedic PTs who practiced in rehabilitation settings had an average mean DP score, whereas in all other practice settings the mean DP & PA scores were low. On the EE sub-scale, PTs in all settings, except those in private practice had average mean scores. Those who practiced in rehabilitation settings had the highest mean EE score for any group. . The authors did not report the number of respondents who fit the burnout criteria of high EE, high DP and low PA.

Two groups of researchers investigated burnout in samples, which included PTs and occupational therapists (OTs) (Balogun et al., 2002; Schlenz et al. 1995). Schlenz et al. (1995) surveyed forty therapists (21 OTs and 19 PTs) who were working in one of thirty head-injury units in the metropolitan areas of the Pacific Northwest. The therapists completed the MBI-HSS and questionnaire designed to gather information about professional development activities such as educational and career advancement opportunities and professional memberships. The questionnaire also included three questions that solicited comments on job-related feeling, professional development activities, and any other issues the respondents wanted to mention. The authors calculated the mean scores for the three MBI-HSS sub-scales and compared with the normative scores presented in the MBI manual (Maslach and Jackson, 1986), reported the percentage of subjects

categorized as score high in EE and DP and low in PA. Spearman rank order correlation calculations were performed to evaluate the direction and magnitude of the relationships between the variables. Mean scores reflected an average level of EE, a low level of DP and a high level of PA. Calculation of the distribution of scores reveals however, that 43% of the sample scored in the high category for EE whereas only 10% scored high in DP and 5% low in PA. From the questionnaire, one consistent theme expressed by subjects was the importance and positive effect of team support. Another theme that emerged was the positive effects of a challenging environment, because it provided opportunities for creativity and professional development. Several subjects were unhappy with limited funds and time for continuing education including reading professional literature. Correlational analyses between the MBI-HSS sub-scale scores and the professional variables resulted in significant correlations of PA with continuing education and years at current job. A significant inverse correlation between total years at present job and EE was also noted. The presence of mentors and career advancement opportunities did strongly to levels of burnout. The authors concluded that a high percentage of therapists experience EE, yet as a group, the therapists had high feelings of PA. Efforts to afford therapists with professional development opportunities appears to be helpful for promoting PA but

needs to be coupled with strategies to decrease EE if in fact EE puts therapists at risk for DP and overall burnout (Schlenz et al., 1995).

The most recent study on burnout in physical and occupational therapists was conducted by Balogun and colleagues and published in 2002. In their study, Balogun et al. (2002) surveyed three hundred seven PTs and OTs working in various hospitals and clinics in New York City to determine the prevalence of burnout among PTs and OTs and factors associated with EE, DP and PA. The subjects completed the MBI-HSS and a survey of socio-demographic and work-related factors which included questions about marital status, practice setting, years in practice, perceived level of support, time spent in meetings. Relationships between the burnout subscales and the socio-demographic/work-related variables were completed using either Pearson's product moment or Kendall correlation coefficient calculations depending on the type of data. Linear, multiple and stepwise regression models were performed to assess the combined and relative contributions of the variables for predicting EE, DP and PA. Of the sample participants, 47% had less than three years of experience and 71% were employed fewer than 4 years at their current facility. Forty-seven percent and 6% indicated a high level of support from their supervisors and colleagues, respectively. The authors provided mean scores for MBI-HSS sub-scales and using the Maslach

and Jackson classification criteria (1981), categorized the percentage of therapists who experienced high, average, and low EE, DP and PA. Of the subjects, 58% scored high in EE, 94% scored high in DP and 97% scored low in PA. Significant, but weak relationships were found between burnout sub-scale scores and some of the socio-demographic and work-related factors including a negative relationship between age and supervisor/colleague support with EE, and a positive relationship between high EE and time spent in meetings. Similar weak, but significant, relationships were found between lower DP scores and supervisor/colleague support and high DP scores with time spent in meetings. Scores on the PA sub-scale were weakly and positively correlated with age and clinical experience and negatively correlated with time spent in meetings and documentation. The authors suggested that the low correlation coefficients between the burnout sub-scale scores and the socio-demographic and work-related factors offered minimal value for predicting burnout. Nevertheless, the finding that perceived support from supervisors and colleagues is associated with lower EE & DP may underpin efforts to encourage collaborative communication between practicing therapists and their supervisors.

Summarizing the results of studies that included the measurement of burnout, it appears that regardless of practice setting or region of the US, PTs experience high rates of EE. Rates of high DP and low feelings

of PA which are necessary, along with EE, to meet the criteria for burnout varied widely across the studies of burnout in PTs. None of the researchers reported each subject's scores across the three sub-scales, nor did they report on how many subjects met the criteria for burnout as defined by Maslach and Jackson (1981). Therefore, the rate of burnout must be inferred from the sub-scale that has the lowest percentage of high EE and DP or low PA scores.

Research Design: Survey

Surveys have been used for decades to gather information about health, illness and quality of life at the population level, for groups of individuals and at the level of the individual. Fryback, Palta, Cherepanova, Bolt, and Kim (2010) have suggested that health-related assessments and instruments can be roughly categorized as indicators, disease-specific measures, generic health profiles, and summary health-related quality of life (HR-QOL) indexes. Data collected in the form of health indicators may measure one particular aspect of health in a population such as the prevalence of obesity or vaccination rates (Fryback et al., 2010). Disease-specific scales often take the form of questionnaires with items assessing the impact of disease severity, as in the case of the State-Trait Anxiety Inventory for Adults (Spielberger, Gorsuch, Lushene, Vagg, & Jacobs, 1983) and the Oswestry Low Back

Pain Disability Index (Fairbank, Couper, Davies, & O'Brien, 1980).

Generic health profiles are most commonly generated by completion of a survey or questionnaire, with the most popular being the Medical Outcome Study Short Form-36 (SF-36) (Ware, Gandek, B., & IQOLA Project Group, 1994). Lastly, summary (HR-QOL) indexes are questionnaires used to measure health and functional status.

Initially survey research had been done through the completion of a paper questionnaire or interview. Questionnaires could either be given directly to, or mailed to, the respondents. Interviews could be done in person or through telephone communication. Since the development of the World Wide Web (Web) and access to personal computers, however, surveys can be conducted and completed through on-line communication (McCalla, 2003). Schonlau, Fricker & Elliot (2001) have reported that the initial electronic-mail (e-mail) surveys were conducted in the 1980s and the first Web based surveys were done in the 1990s. With e-mail, researchers send surveys to individual e-mail addresses as text. The recipients can then either read, save, respond to, or discard the survey, similar to a paper survey (Brawner, Felder, Allen, Brent, Miller, 2001). A web-based survey is posted on a website and may include text, pictures and interactive features. Galin (1998) suggests that the response modes are different between e-mail and web-based surveys because e-mail uses "push" technology

whereas the Web uses “pull” technology. With e-mail, sent messages are automatically received in the potential respondent’s inbox. With web-based surveys, the respondent must in some way, be attracted to the website that hosts the survey.

Response rates for mail surveys have ranged from 22% to 78%, whereas response rates for e-mail and web surveys have been 2% to 70% and 5% to 62% respectively. Combined web and e-mail surveys have had response rates of 35-78% suggesting that Internet surveys using both e-mail and Web response modes have similar response rates to postal mail and higher response rates than those using either an e-mail or Web response mode (Schonlau, et al., 2001).

A search of the literature did not reveal any studies in which psychometric properties of the paper-and-pencil versions of the PPS10 or MBI-HSS have been compared to the web-based versions. However, a few studies were identified in which researchers compared results of paper-and-pencil questionnaires with those administered via the web (Buchanan & Smith, 1999; Davis, 1999; Ritter, Lorig, Laurent & Matthew, 2004). Buchanan and Smith (1999) and Davis (1999) both found comparable results and similar psychometric properties between Web and paper-and-pencil versions of different personality measures. Ritter and colleagues (2004) investigated the similarities and differences between the Internet version and the paper-and-pencil

version of 16 self-report instruments useful for the evaluation of health and well-being. The standardized measurement tools included, but were not limited to the Health Distress measure (Lorig, Stewart, Ritter, Gonzalez, Laurent, & Lynch, 1996), the Illness Intrusiveness instrument (Devins, et al., 1990), and the Health Assessment Instrument (Fries, Spitz, Kraines, & Holman, 1980). Of the 16 tools, none showed significant differences between the Internet and paper-and-pencil version. The authors also noted that the Internet questionnaires required less follow-up to achieve a slightly higher completion rate compared to the mailed surveys (Ritter et al., 2004). Results from studies that included investigations of response rates or the psychometric properties of Internet questionnaires suggest that using an Internet-based strategy for surveying PTs about stress and burnout is a reasonable method for conducting this research.

Relevance of the Literature Review to the Proposed Study

The review of literature helps to define stress and burnout and identifies what is known about these conditions in nurses and physicians. Researchers have not only investigated the prevalence of stress and burnout in nurses and physicians, they have studied the effects of these conditions. In addition, they have explored factors that may be associated with stress and burnout. Investigations of these

conditions in PTs have been very limited. No studies of stress in PTs have been identified, and the most recent study of burnout, which included both PTs and occupational therapists, was published more than ten years ago. The literature review also reveals some discrepancies about how burnout is reported, despite the use of a standardized measurement tool. This study will be the first stratified, nationwide survey of PTs across all practice settings. It will provide prevalence information of stress and burnout in PTs and will be the first study to report the percentage of PTs who meet criteria of burnout (high EE, high DP, and low PA). This information will form the foundation for future research in this area. This paper will also inform the study of burnout by demonstrating the inconsistencies of how burnout is reported, and by recommending a set of subscale cut-off scores to be used when measuring burnout in PTs. In addition, this study will address the relationship between perceived stress and burnout, which has received little attention in the literature.

Chapter III

METHODS

Research Aims, Questions, and Hypotheses

Burnout is a psychological syndrome found in professionals who work with patients or clients who have serious emotional and physical needs. People are considered to have burnout if they have a high level of emotional exhaustion (EE), strong feelings depersonalization (DP) and a low sense of personal accomplishment (Maslach & Jackson, 1981). Burnout in physicians and nurses has been well investigated in large-scale studies, (Passalacqua & Segrin, 2012; Purcell et al., 2011; Shanafelt et al., 2009; Shanafelt et al., 2011; Sharma et al., 2008), however, only a few regional reports of burnout rates, all published earlier than 1998, have been published about physical therapists (PTs) (Deckard & Present, 1989; Donohoe, et al., 1993; Schuster, et al., 1984; Wandling & Smith, 1997).

Hans Selye (1907-1982) borrowed the term “stress” from physics and used it for referring to the demands placed on an individual, the challenge to a person’s homeostasis, and the evoked response of adaptation (Chronousos & Gold, 1992; Selye, 1982). Selye suggested that stressors do not have to be

physical in nature. Rather, emotions can initiate adaptive functions in an effort to restore normalcy (Selye, 1956, 1982). Cohen, Kessler, and Gordon (1995) and others (Hobfoll, et al., 1998) have proposed that appraisal of one's self and the situation are important elements of stress so that stress should be viewed as occurring when individuals perceive environmental demands to tax or exceed their adaptive capacity.

Several national survey studies of stress levels in physicians and nurses have been published (Beck & Gable, 2012; Lesage, Berjot, Altinas, & Paty, 2013; Shanafelt, Kaups, Nelson, Satele, Sloan, Oreskovich, & Dyrbye, 2014; Ulrich, Taylor, O'Donnell, Farrar, Danis, & Grady, 2010; West, Halvorse, Swenson & McDonald, 2013), however no studies of stress in physical therapists (PT) have been identified. To expand the knowledge of stress and burnout in healthcare, the overall aim of this study was to investigate the prevalence of stress and burnout in a national sample of PTs.

Research questions. This study focused on the following research questions.

1. What is the current prevalence of high EE, high DP, low PA, and burnout in a national sample of working physical therapists?
2. What is the level of perceived stress in a national sample of PTs?
3. Is a high level of perceived stress associated with any of the subscales of burnout (EE, DP, PA) or overall burnout?

Hypotheses.

1. The first hypothesis of this study was that physical therapists will have a prevalence rate of EE, DP, PA and overall burnout similar to the national normative sample of social service providers, nurses and physicians. This hypothesis was based on the observation that the demands placed on physical therapists are similar to the demands placed on other health and human service providers.
2. The second hypothesis of this study was that mean perceived stress scores will be higher in a national sample of PTs compared to a heterogeneous US population. This hypothesis was based on perceived stress scores observed in nurses and physicians, which were higher than a heterogeneous population (Sharma, et al., 2008; Sood, et al., 2011; Waldman, et al., 2009).
3. The third hypothesis of this study was that high levels of perceived stress will be associated with high EE. This hypothesis was based on the relational concept of stress (Lazarus & Folkman, 1986) and the stress-response sequence described by Elliott and Eisendorfer (1982).

Paradigm and Research Design

Survey research includes methods that involve asking questions of participants or respondents and can be divided into two categories: interviews and questionnaires. During an interview, the researcher or assistant asks the participants questions, records the responses and if necessary, can probe or ask follow-up questions (Trochim & Donnelly, 2006). Questionnaires are structured surveys that are self-administered using pen and paper or electronic formats. Whether paper questionnaires are mailed or electronic questionnaires are e-mailed to the participants, questionnaires allow respondents to complete the survey at their own convenience and can be standardized so that every participant can be exposed to the same questions in the same way. This reduces potential bias from interactions with researchers and provides anonymity, encouraging honest and candid responses (Portney & Watkins, 2009).

Information collected from interviews and questionnaires is considered to be self-report data, which is different from data recorded when a researcher directly observes a participant's behavior or attitude. Self-reports include the potential for bias or inaccuracy particularly when the questions concern personal issues. However, research has shown that self-report measures are generally valid and for many variables, such as perceptions and attitudes, self-report may be the most direct and accurate way to gather that information (Portney & Watkins, 2009). A disadvantage of mail and email questionnaires is

that the return rate can vary widely and that actual response rates may be lowered further by having to discard returns that were incomplete or completed incorrectly (Portney & Watkins, 2009; Schonlau, et al., 2001) however, they are more efficient than gathering information through personal interviews.

To study the prevalence of stress and burnout in PT members of the American Physical Therapy Association (APTA), a national cross-sectional on-line survey was developed and administered. The principal investigator (PI) sent e-mail invitations to PT members of the APTA (Appendix E) asking them to participate in the study and complete the survey. Data from the survey was then compared to national norms of perceived stress and burnout. A survey research design of stress and burnout in PTs is appropriate for being able to answer the research questions, “What is the current prevalence of high EE, high DP, low PA, and burnout in a national sample of physical therapists?” and “What is the level of perceived stress in a national sample of PTs?” Data from the survey can also be analyzed to answer the question, “Is a high level of perceived stress associated with any of the subscales of burnout (EE, DP, PA) or overall burnout?”

Approval of the study was obtained from the Rutgers Institutional Review Board for the Protection of Human Subjects (Appendix F). The study was initiated in November 2013 and completed in March 2014.

Variables and Operational Definitions

Stress. Stress occurs when individuals perceive that environmental demands are taxing or exceeding their adaptive capacity (Cohen, Kessler, & Gordon, 1995). Researchers have proposed that perceived stress can be viewed as an outcome variable, one that measures stress as a function of stressful events, coping processes, and personality factors (Cohen, et al., 1983). For the purposes of this study, stress was measured using the 10-item Perceived Stress Scale (PSS10) (Appendix A) which was designed to measure the degree to which people appraise their environment and circumstances as unpredictable, uncontrollable and overwhelming (Cohen et al., 1983).

Burnout. The term, burnout, was first coined by Freudenberger (1975), who wrote about his observations of professionals whose responsibilities included working with and responding to the needs of people in crisis. Maslach (1976) also sought to describe burnout and interviewed a wide range of human services workers about the emotional stress of their jobs. Maslach's (1976) findings, which were consistent with Freudenberger's (1975), led to the operational definition that burnout is a complex psychological syndrome experienced as a response to the emotional demands of working with people in need of physical and/or psychological support (Maslach and Jackson, 1981).

Burnout, as a syndrome, includes the dimensions of emotional exhaustion (EE), depersonalization (DP) and personal accomplishment (PA), all of which reflect potential aspects of the relationships individuals have at work (Maslach, Schaufelt, & Leiter, 2001; Taris, et al., 2005). According to Maslach and Jackson (1981), burnout is defined as having high EE, high DP and low PA. For the purposes of this study burnout was measured using the Maslach Burnout Inventory - Human Services Scale (MBI-HSS), an instrument comprised of three subscales, EE, DP, and PA (Appendix C) (Maslach & Jackson, 1981).

Subjects

Recruitment for participants was done through an e-mail invitation sent to a stratified sample of 6,500 PT members of the APTA who have their e-mails listed in the on-line membership. The sample size was determined in consideration of the total number of PTs in the APTA and the cost of conducting the survey. At the time of the survey, the APTA had estimated that there were approximately 54,000 PT members, so a sample of 6,500 would be slightly more than 12% of the PTs. Although the PSS and demographic questions can be administered on-line without cost, the MBI-HSS is copyrighted and requires a fee for use. The cost per survey ranges from \$2.40 (for 50 or less surveys) to \$0.54 (for 4,000 or more). When done electronically a fee is generated when participants access the survey regardless if they

complete the survey. Thus, the cost to conduct the survey would be \$3,900.00 if all those invited to participate in the study accessed the survey. Although a 100% response rate was not anticipated, Schaonlau et al. (2001) found that e-mail surveys have had response rates of 35-78%, which would estimate the cost of the survey to be between \$1,365 and \$3,042. Acknowledging a limited budget, 6,500 PTs were invited to participate in this study. A 35% response rate would render 2,275 surveyed PTs, a sample size that far exceeds all studies of burnout in PTs and many studies of physicians and nurses.

Recruitment for participants was done through an e-mail invitation sent to a stratified sample of 6,500 PT members of the APTA who have their e-mails listed in the on-line membership directory. The APTA membership directory was culled for all PT members from August 5-6, 2013. A total of 58,847 PT registrations were identified across all 50 states and the District of Columbia. Of the PT registrations, 58,777 were unique, meaning 70 registrations belonged to PTs who were registered to more than one chapter. PTs with more than one registration were randomly assigned to one of their registered chapters. Stratification was based on the number of PT members per state. For example, 3,925 PTs from New York were listed in the directory, which is 6.68% of the national sample. Although not all the PTs from New York had their e-mail addresses in the directory, those who did were then randomly selected via a computerized randomization program to receive an e-mail invitation to participate in the survey. This resulted in 434 PTs from New York

receiving an e-mail invitation. The percentage and distribution of PTs per state, and the number of PTs from each state who were emailed an invitation to participate in the survey, can be found in Appendix G. A one hundred dollar gift card drawing was used as an incentive to complete the survey.

An invitation to complete the survey was e-mailed to 6,500 PTs and opened by 2,774 in November 2013. One hundred fifty-six e-mails were not received by their intended recipients because they were either undeliverable or marked as spam. Of the 2,774 PTs who opened the invitation, 1,024 agreed to participate in the study, and 984 completed the survey. In January 2014, PTs who did not complete the survey were sent a second invitation to participate in the study. Of the 5,584 e-mail invitations that were sent, 2,188 opened the e-mail and one hundred forty-nine PTs completed the survey. A third invitation was sent in March 2014. Of the 1,722 who opened the survey, two hundred thirty-three completed it for a total of 1,366 respondents.

Of the PTs who participated in the study, 1.2% were retired and .7% were unemployed. Because the true definition of burnout reflects a complex psychological syndrome associated with the context of working with people who have medical and/or psychological concerns, only those PTs (N=1,340) who are working were included in testing the study's hypotheses.

Instrumentation, Data Collection, Reliability and Validity

Data collection. On November 14, 2013, 6,500 PTs were e-mailed invitations to participate in the survey (See Appendix E). An e-mail marketing company, Constant Contact®, was employed to send out the invitations in order to avoid junk mail alerts and other interferences that can occur when a large number of e-mails are sent from a single address at the same time. A second invitation was e-mailed on January 28, 2014 to PTs who did not respond to the first invitation. On March 18, 2014, a third invitation was e-mailed to those who still failed to respond to the request to take the survey.

To facilitate data collection, Mind Garden, Inc. was sent a list of the 6,500 names and e-mail addresses of the PTs who received an invitation. Mind Garden, Inc., who suppressed all identifying information from the PI, recorded data through survey software and a secure server. This ensured protection of the data and the rights of the participants, including confidentiality and the right to withdraw from the study by not submitting their responses. Because Mind Garden, Inc. required participants to enter their e-mail address and create a password to access the survey, the integrity of the sample was maintained. Response data without any identifying information was then made available to the researcher, through a username and password.

The study was approved by the Rutgers Institutional Review Board (IRB). The e-mail invitation sent to the participants included information about how to

contact the PI and IRB. Data has been stored on Mind Garden, Inc.'s secure server which is password protected.

Instrumentation, reliability and validity. The survey was compiled to gather information about stress, burnout and participant demographics. Mind Garden, Inc. manages the copyright for the MBI-HSS and is able to distribute it electronically and through paper copies. When conducting an on-line survey using the MBI-HSS, Mind Garden has the ability to add additional questions to the survey and provide responses to all the items. For this study, Mind Garden, Inc. rendered surveys that included the MBI-HSS, the 10-item Perceived Stress Scale (PSS10) and demographic questions.

Perceived stress. The Perceived Stress Scale (PSS) is one of the most widely used instruments for measuring the perception of stress (Cohen, et al., 1983). The items on the PSS ask respondents to report whether their lives seem unpredictable, uncontrollable or overloaded. The items are general in nature and hence relatively free of content specific to work or any sub-population work. The PSS has three versions, the 14-item, 10-item and the 4-item. This study used the PSS10 (Appendix A) based on the recommendation by Cohen and Williamson (1988) and Lee (2012) that the PSS10 be used for research, and their observation that the PSS10 has better internal reliability (alpha coefficient = .78) than the PSS14 (alpha coefficient = .68). In a review

of twelve studies that included psychometric analysis of the PSS10, Lee (2012) reports its internal consistency, as measured by Cronbach's alpha to be $>.70$, and its test-retest reliability to be $>.70$ across all studies. Criterion validity of the PSS10 was also reviewed by Lee (2012) and found to be infrequently reported, yet strongly correlated ($r > .70$) with the mental component of health status as measured by the Medical Outcomes Study - Short Form 36 in two studies. The PSS10 includes responses rated on a 5-point scale ranging from never (0) to almost always (4) based on their occurrence during 1 month prior to taking the survey (Appendix A). Scores on the PSS10 can range from 0 - 40 with higher scores indicating higher perceived stress, although there are no universally agreed upon cutoff values of high and low stress. Normative data on a representative US sample have been published (Cohen & Janicki-Deverts, 2012).

Burnout. Burnout was assessed using the Maslach Burnout Inventory-Human Services Survey (MBI-HSS), a 22-item questionnaire (Appendix C). The MBI-HSS was designed by Maslach and Jackson (1981) to assess what they defined as the three dimensions of burnout, emotional exhaustion (EE), depersonalization (DP) and personal accomplishment (PA). All three dimensions are necessary for understanding burnout because they reflect the multifaceted relationships individuals have with work (Maslach, et al., 2001; Taris et al., 2005). Maslach, Jackson, and Leiter (1997) determined

internal consistency, as measured by Cronbach's alpha to be .90 for EE, .79 for DP and .71 for PA. Test-retest reliability coefficients for the subscales were found to be .82 for EE, .64 for DP, and .80 for PA (Maslach & Jackson, 1981).

Each item of the MBI-HSS is rated on a seven-point Likert-like scale, ranging from "never" (0) to "every day" (6). Each dimension or subscale is scored and considered separately and are not combined into a total composite score for burnout. Rather, each subscale has been categorized as high, average or low based on the upper, middle and lower thirds of a normative sample of 11,067 physicians, nurses and social service providers (Maslach and Jackson, 1981). Scores for EE range from 0 - 54, whereas scores for DP range from 0-30 and scores for PA can range from 0-48. Burnout is reflected in high scores on the EE (≥ 27) and DP (≥ 13) subscales and a low score on the PA (≤ 31) subscale.

Demographic data. Demographic information was gathered by asking questions consistent with the APTA's regularly published demographic profile of PTs. Participants were asked to indicate their gender, ethnicity, race, age, years in the profession, highest degree earned, employment status and work facility or setting (Appendix H).

Data Analysis

De-identified data was downloaded from Mind Garden, Inc. into Microsoft Excel and then imported into IBM SPSS statistical software version 22.0 (IBM Corporation, Somers, NY). Significance was established at $p \leq 0.05$. To compare the study participants with a national sample of PT members of the APTA a Chi-square goodness of fit was conducted for each of the demographic categories (Portney & Watkins, 2009).

Unequal variances were assumed between the PSS10 scores of a national sample and the participants of this study (Cohen & Janicki-Deverts, 2012) and so a one sample t test was performed to compare the samples (Portney & Watkins, 2009). Cohen and collaborators (Cohen & Janicki-Deverts, 2012; Cohen, Kamarck, & Mermelstein, 1983; Cohen & Williamson, 1988) have indicated that although mean PSS scores from large US samples have been determined, there are no cut-off scores for high, average and low stress, and that the PSS is not a diagnostic instrument. They suggest that comparisons can and should be made within one's own sample. Researchers using the PSS10, the fourteen-item Perceived Stress Scale (PSS14), and the four-item Perceived Scale (PSS4) have established cut-off scores for high stress in different ways. Jacob, Itzchak and Raz (2013) used two standard deviations above the mean to define high stress. Hauksdottir, McClure, Jonsson, Olafsson, and Valdimarsdottir (2013) determined high stress to be scores greater than the 90th percentile of the sample, whereas Dolbier and

Rush (2012) considered students with scores in the 66th percentile and higher to have high stress. Some investigators have determined high, average and low stress scores based on the tercile scores of their samples (Lesage, Berjot, Altintas, & Paty, 2013; van Eck, Berkhof, Nicolson, & Sulon, 1996), whereas other researchers have used the top quartile (25%) scores of their samples to represent high stress. (El-Masry, Ghreiz, Helal, Audeh, & Shams, 2013; Kollipaka, Arounassalame, & Lakshminarayanan, 2013; Silveira, Pekow, Dole, Markenson, & Chasan-Taber, 2013). For the purposes of this study high stress was defined as scores greater than the 85th percentile (high PSS10 \geq 21).

One sample *t* tests were performed to compare the EE, DP and PA scores of the participants with the scores Maslach and Jackson (1981) recorded in a sample ($N = 11,067$) of physicians, nurses, and social service providers. Cohen's *d* tests were performed to determine the effect size between the PT sample and the Maslach and Jackson (1981) sample.

Maslach & Jackson (1981) have defined burnout as having high EE (≥ 27), high DP (≥ 13) and low PA (≤ 31). Descriptive statistics were performed to determine the number of participants from the PT sample who met this criteria of burnout. Several researchers have challenged the cut-off scores for burnout established by Maslach and Jackson (1981) because they are somewhat arbitrary. They are based on Maslach and Jackson's (1981) statistical criterion of thirds, rather than a criterion based on clinical observations (Schaufeli,

Fakker, Hoogduin, Schaap, & Kladler, 2001; Schaufeli & Enzmann, 1998; Schaufeli and Van Dierendonck, 1995; Vanheule, Rosseel and Vlerick, 2007). Schaufeli and Van Dierendonck (1995) have suggested that percentile ranges be used to distinguish levels of burnout because they allow flexibility in the delineation of individuals with extreme values, however, the selection of percentile ranges to determine high, average and low EE, DP, PA can also be arbitrary. Vanheule et al. 2007 have recommended that burnout categories be calculated using the upper, middle and lower terciles for every sample of participants, because different disciplines will likely be influenced by differences in work content, responsibilities and professional goals. Schaufeli and Enzmann (1988) also recommend this approach when measuring burnout across different nations, because expectations and the value of personal accomplishment in the work place can vary from country to country. Therefore, frequency counts of the PT sample were used to establish the tercile scores and determine a criterion of burnout for the PT sample ($EE \geq 24$, $DP \geq 5$, $PA \leq 40$).

To determine if high levels of perceived stress are associated with high EE, the continuous variable of PSS10 scores was stratified into high stress and not high stress and the continuous variable of EE was stratified into high EE and not high EE (average and low EE). A Pearsons chi-square test was used to analyze the relationship between the dichotomous variables. A chi-square test was also used to explore the relationship between high PSS10

scores and high DP and high PSS10 and low PA. DP was stratified into high DP and not high DP (average and low). PA scores were stratified into low PA and not low PA (average and high). To determine if high levels of stress are associated with burnout (high EE, high DP, and low PA), the categorical data was analyzed using chi-square. Odds ratio and 95% confidence intervals were also calculated.

Methodological Assumptions and Limitations

As with any survey research, it was assumed that the participants would respond truthfully to all the items of the survey. A primary limitation of this study was that it only included PT members of the APTA and not all licensed PTs in the US. The decision to survey APTA members was based on the fact that the number of, and the demographic information about APTA members was available. Information about the actual number of licensed PTs in the US is difficult to ascertain because PTs can be licensed in multiple states and there is no central database of PTs. In addition, e-mail addresses of licensed PTs are not available from every state. Thus, a nationwide on-line survey of all PTs could not be done. The selection of APTA members for this study may however, threaten external validity because differences between APTA members and non-APTA members may exist. Over 60% of PT members of the APTA have published e-mail addresses, however, surveying a random

selection of only those PT who published their e-mail address in the APTA directory may contribute to selection bias.

Chapter IV

RESULTS AND FINDINGS

Participants

An e-mail invitation to participate in this study was sent to a stratified sample of 6,500 physical therapist (PT) members of the American Physical Therapy Association (APTA) who have their e-mails listed in the membership directory. Of those who received the invitation, 1,366 PTs agreed to participate in the study and completed the survey. Women comprised 69% of the survey respondents and 91.7% were White. This profile of PTs is consistent with data from the APTA. Demographic characteristics of the PTs who responded to the survey and all PT members of the APTA are presented in Table 4. Chi-square goodness of fit found that the groups are similar for gender, ethnicity, race and age. There are differences between the groups in years in the profession, $\chi^2(7, N = 1366) = 84.30, p < .05$, employment status, $\chi^2(7, N = 1366) = 43.72, p < .05$, highest degree earned $\chi^2(4, N = 1366) = 15.33, p < .05$ and facility setting $\chi^2(11, N = 1366) = 52.24, p < .05$.

Table 4

Comparison of Survey Sample of PTs and PT members of the APTA as Percentages

Characteristics	Survey Sample	APTA
Gender		
Female	69.0	69.9
Male	31.0	31.0
Ethnic origin		
Latino/Hispanic	2.3	2.4
Not Latino/Hispanic	97.7	97.6
Race		
American Indian/ Alaska Native	.8	0.8
Asian	4.9	4.7
Black	1.3	1.2
Native Hawaiian/ Pacific Islander	.3	0.3
White	91.7	91.7
Age		
20 – 24	0.7	0.9
25 – 29	14.8	14.3
30 – 34	10.8	13.8
35 – 39	10.2	10.4
40 – 44	12.4	11.6
45 – 49	11.5	12.6
50 – 54	13.2	11.7
55 – 59	13.5	13.0
60 – 64	8.7	7.9
65+	4.0	3.8
Years in profession*		
< 1	0.8	5.2
1 – 3	14.7	11.0

4 – 5	6.3	6.1
6 – 10	8.5	11.3
11 – 15	11.8	12.9
16 – 20	12.5	11.3
21 – 30	22.3	20.1
31+	23.1	22.2
Highest degree earned*		
BA/BS	22.8	19.0
MA/MS	26.8	27.8
DPT	43.0	44.4
PhD	5.5	5.6
PhD & DPT	1.8	1.2
Employment status*		
FT salaried	53.7	58.6
PT salaried	5.0	5.2
FT self-employed	13.2	9.7
PT self-employed	2.9	3.0
FT hourly	14.8	12.8
PT hourly	8.6	7.9
Retired	1.2	1.8
Unemployed	0.7	1.3
Facility/setting*		
Acute care	10.6	11.0
Inpatient rehab/subacute	3.5	3.9
Hospital outpatient	20.6	20.3
Private outpatient	37.0	33.0
Skilled nursing facility	4.9	4.2
Home care	8.1	6.7
School	4.1	3.8
Academia	7.1	10.4
Industry	0.4	0.5
Health and wellness	0.5	0.3
Research center	0.4	0.2

Other	2.9	5.9
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Note. APTA data from “Physical Therapist Member Demographic Profile 2013”, contact research-dept@apta.org

FT=full-time; PT=part-time

* $p < .05$

Question 1

The first research question was, “What is the current prevalence of high EE, high DP, low PA, and burnout in a national sample of physical therapists”?

Hypothesis 1. PTs will have rates of emotional exhaustion (EE), depersonalization (DP), personal accomplishment (PA) and overall burnout similar to the national sample of social service providers, nurses and physicians.

Means (M) and standard deviations (SD) for the subscales EE, DP, and PA were determined for the survey sample. T-tests were performed to compare the survey sample means with mean scores of the Maslach and Jackson (1981) sample that included 11,067 social service providers, nurses and physicians. Cohen’s d tests were also performed to determine the effect size between the samples (Portney & Watkins, 2009). PTs in the survey sample had lower mean EE ($M=19.04$, $SD=11.30$) and lower mean DP ($M=4.48$, $SD=4.55$) than the social service providers, nurses and physicians ($M=20.99$, $SD=10.75$; $M=8.73$, $SD=5.89$), $t(12,405)=6.24$, $p<.0001$, $d=.18$ and

$t(12,405)=25.51, p<.0001, d=.81$ respectively. The PTs had higher PA ($M = 41.91, SD=5.15$) than the subjects surveyed by Maslach ($M=34.58, SD= 7.11$), $t(12,405)=36.59, p<.0001, d=1.18$. The results are presented in Table 5.

Table 5

Comparison of Mean Burnout Subscale Scores between Physical Therapists and the Maslach Sample

Burnout Subscale	PTs (n = 1,340) Mean (SD)	Maslach (n = 11,067) Mean (SD)	t-score (df =12,405)	Cohen's d
EE	19.04 (11.30)	20.99 (10.75)	6.24*	0.18
DP	4.48 (4.55)	8.73 (5.89)	25.51*	0.81
PA	41.91 (5.15)	34.58 (7.11)	36.59*	1.18

Note. Maslach from "The measurement of experienced burnout," by C. Maslach and S. E. Jackson, 1981, *Journal of Occupational Behavior*, 2, pp. 99-113. PTs = physical therapists
 $p < .001$

Mean scores are one way to compare EE, DP and PA in different samples, however mean scores are not considered determinate of burnout. Rather, scores need to be classified as high, average or low to determine if the criteria of burnout has been met. Tercile scores of the PT sample were determined based on the recommendation of several researchers who have suggested that burnout categories of high, average and low be calculated for every sample surveyed and not rely on the cut-off scores established by

Maslach and Jackson (1981), because different disciplines will likely be influenced by differences in work content, responsibilities and professional goals (Schaufeli, Fakker, Hoogduin, Schaap, Kladler, 2001; Schaufeli & Enzmann, 1998; Schaufeli and Van Dierendonck, 1995; Vanheule, Rosseel and Vlerick, 2007). Therefore, tercile scores of the PT sample were calculated and are presented in Table 6.

Table 6

Tercile Scores for High, Average and Low EE, DP, and PA for the PT Sample

Burnout Subscales	Tercile scores for PTs
Emotional Exhaustion (EE)	
High EE	≥ 24
Average EE	13-23
Low EE	≤ 12
Depersonalization (DP)	
High DP	≥ 5
Average DP	2-4
Low DP	≤ 1
Personal Accomplishment (PA)	
High PA	≥ 45
Average PA	41-44
Low PA	≤ 40

Note. PTs = physical therapists

When the cut-off scores for the PT sample are used to determine the number of PTs who fit the definition of burnout (high EE, high DP and low PA), 12.6% (N = 165) fit that criteria (Table 7).

Table 7

Categorization of Burnout in Physical Therapists According to Tercile Subscale Scores of the PT Sample

Burnout Subscales	PTs (n = 1,340)
High EE (≥ 24)	33.8%
High DP (≥ 5)	30.4%
Low PA (≤ 40)	31.7%
Burnout	12.6%

Note. PTs = physical therapist;s EE = emotional exhaustion; DP = depersonalization; PA = personal accomplishment

The majority of investigators who have used the MBI-HSS have reported results using the cut-offs for EE, DP and PA that were established by Maslach and Jackson (1981). They established categories of high, average and low scores for the three subscales by dividing the sample (N = 11,067) into thirds. Burnout, defined as high EE, high DP and low PA, means that persons with burnout have an EE score ≥ 27 , a DP score ≥ 13 and a PA score of ≤ 31

(Maslach & Jackson, 1981) When those scores are used to categorize the PT sample ($N=1,340$), 29% of the PT sample were found to have high EE, 7.2% have feelings of DP and 4.5% were found to have a low sense of PA. Maslach and Jackson (1981) did not report the number of subjects who had met their criteria of burnout ($EE \geq 27$, $DP \geq 13$, and $PA \leq 31$). In the sample of PTs, less than 1% ($N=9$) satisfied this definition of burnout when the cut-off values defined by Maslach and Jackson's (1981) sample of health care providers is used (Table 8).

Table 8

Categorization of Burnout in Physical Therapists According to Subscale Scores Established by Maslach and Jackson (1981)

Burnout Subscales	PTs (n = 1,340)
High EE (≥ 27)	29.3%
High DP (≥ 13)	7.8%
Low PA (≤ 31)	7.2%
Burnout	0.7%

Note. From "The measurement of experienced burnout," by C. Maslach and S. E. Jackson, 1981, *Journal of Occupational Behavior*, 2, pp. 99-113, burnout is defined as having high EE, high DP, and low PA. PTs = physical therapists; EE = emotional exhaustion; DP = depersonalization; PA = personal accomplishment

Comparison of the cut-off scores between those determined by terciles of the PT sample and those reported by Maslach and Jackson (1981) reveals that the PT cut-off scores for high EE and high DP are three and six points

lower, respectively, than the sample studied by Maslach and Jackson (1981).

Low PA, rather than high PA, is the third component of burnout. The cut-off score for low PA in PTs is nine points higher than the cut-off score for the Maslach sample (Maslach & Jackson, 1981) (Table 9).

Table 9

Tercile Scores for High, Average and Low EE, DP, and PA for the PT Sample and the Maslach and Jackson (1981) Sample

Burnout Subscales	Tercile scores PTs	Tercile scores Maslach
Emotional Exhaustion (EE)		
High EE	≥ 24	≥ 27
Average EE	13-23	17-26
Low EE	≤ 12	≤ 16
Depersonalization (DP)		
High DP	≥ 5	≥ 13
Average DP	2-4	7-12
Low DP	≤ 1	≤ 6
Personal Accomplishment (PA)		
High PA	≥ 45	≥ 39
Average PA	41-44	32-38
Low PA	≤ 40	≤ 31

Note. Tercile scores for Maslach from, "The measurement of experienced burnout," by C. Maslach and S. E. Jackson, 1981, *Journal of Occupational Behavior*, 2, pp.99-113. PTs = physical therapists

Question 2

The second research question was, “What is the level of perceived stress in a national sample of PTs”?

Hypothesis 2. Perceived stress scores will be higher in a national sample of PTs compared to a heterogeneous US population.

PT scores on the Perceived Stress Scale-10 (PSS10) ranged from 0 to 35 ($M=14.08$, $SD=6.38$, $Mdn=13.00$). The scores were close to a normal distribution, with skewness of .36 ($SE=.07$) and kurtosis of -.38 (.13).

Representation of a normal curve and the distribution of PSS10 scores in PTs can be found in Figure 3.

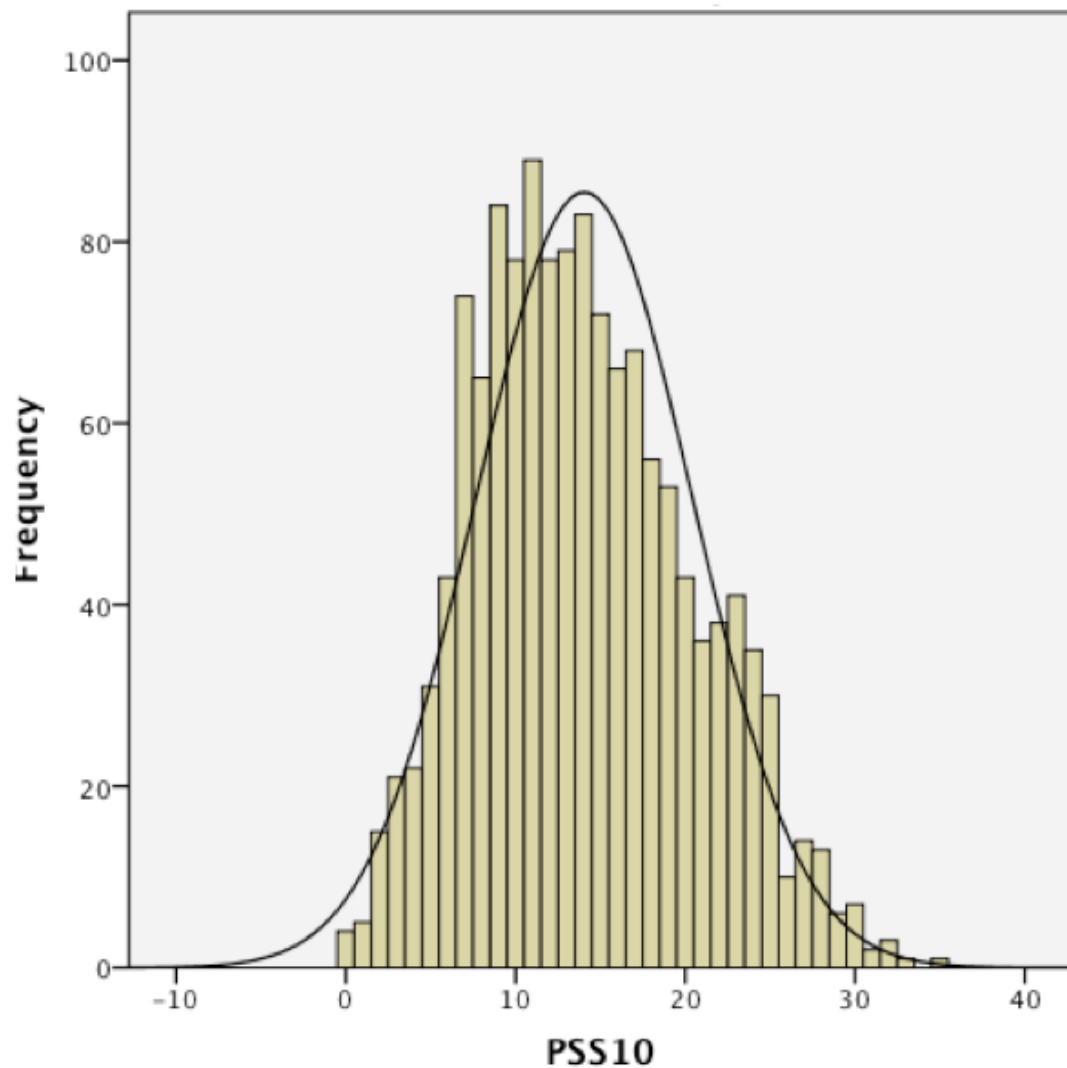


Figure 3. Frequency distribution of PT scores ($N = 1,340$), on the PSS10 and a normal curve. PSS scores range from 0-40. Mean = 14.08, Standard Deviation = 6.38, Median = 13.00

Cohen and Janicki-Deverts (2012) published normative data for PSS10 from a large probability sample of the United States ($N = 2000$) in 2009. T-tests and Cohen's d tests (Portney & Watkins, 2009) were performed to

compare the means of the national sample with mean scores of PTs and to determine the effect size between the groups. The results are presented in Table 10.

Cohen and Janicki-Deverts (2012) reported mean PSS10 scores for women and men but did not report the mean for the total sample. A t-test showed that female PTs ($M = 14.56$, $SD = 6.49$) scored lower on the PSS10 compared to a national sample of women ($M = 16.14$, $SD = 7.56$), $t(1,338) = 6.25$, $p < .0001$, $d = .22$. Male PTs ($M = 13.00$, $SD = 5.99$) were also found to score lower on the PSS10 compared to a national sample of men ($M = 15.52$, $SD = 7.44$), $t(1,338) = 10.35$, $p < .0001$, $d = .21$.

Table 10

Comparison of PSS10 Scores from a National Sample of Physical Therapists and a National Sample of US Citizens

	PTs ($N = 1,340$) Mean (SD)	National sample ($N = 2,000$) Mean (SD)	t-score ($df = 3,338$)	Cohen's d
Female	14.56 (6.49)	16.14 (7.56)	6.25*	0.22
Male	13.00 (5.99)	15.52 (7.44)	10.35*	0.21
Total	14.08 (6.38)	NR	NA	NA

Note. National sample from "Who's stressed? Distributions of psychological stress in the United States in probability samples from 1983, 2006, and 2009." by S. Cohen and D. Janicki-Deverts, 2012, *Journal of Applied Social Psychology*, 42, pp. 1320-1334. PTs = physical therapists.

* $p < .0001$

Question 3

The third research question was, “Is a high level of perceived stress associated with any of the subscales of burnout (EE, DP, PA) or overall burnout”?

Hypothesis 3. High levels of perceived stress will be associated with high EE.

In the PT sample, the mean PSS10 score was 14.04 (SD = 6.38). For the purposes of this study high stress was defined as scores at or above 85th percentile (high PSS10 ≥ 21). Of the PTs surveyed in this study, 14.8% were found to have high perceived stress. Scores from the PSS10 were categorized into high levels of perceived stress and not high (≤ 20) levels of perceived stress. Similarly, scores on the EE subscale were categorized as high (≥ 24) or not high (average and low). This categorization was based on the tercile scores of the PT sample.

A Pearson chi-square test and estimate of risk were performed to determine the relationship between high levels of perceived stress and high EE (Portney & Watkins, 2009). The results indicate a moderately strong relationship between high PSS10 scores and high EE, $\chi^2 (1, N=182)=260.81$, $p<.001$ $\phi = .441$ (Dancey & Reidy, 2004). In addition, the results indicate that 77.8% of the PTs with high perceived stress also reported high EE, and that

PTs who have high perceived stress are 11.6 times more likely to rate high on EE than PTs who do not have high perceived stress (Table 11).

DP scores were categorized as high (≥ 5) or not high (average and low) and PA scores were categorized as low (≤ 40) or not low (average or high), according to the tercile scores of the PT sample. To explore the relationships between high levels of perceived stress and high DP, and high perceived stress scores and low PA, chi-square tests were performed. The results indicate a modest relationships between high perceived stress and high DP, $\chi^2 (1, N=138)=57.75, p<.001, \phi = .208$, and high perceived stress and low PA, $\chi^2 (1, N=121)=105.44, p<.001, \phi = .281$ (Table 11).

When high perceived stress was compared to burnout using the PT cut-off scores, 35% of the PTs who reported high perceived stress also reported burnout. The odds ratio of 6.6 with a 95% confidence interval of (4.67, 9.43) suggests that PTs who have high perceived stress are almost 7 times more likely to experience burnout than those who do not have high perceived stress. Chi-square test resulted in a modest relationship $\chi^2 (1, N=82)=135.65, p<.001, \phi = .318$ between high perceived stress and burnout (Table 11).

Table 11

Pearson Chi-Square Results, Odds Ratios (OR) and Confidence Intervals (CI) for the Relationships Between High PSS Scores and High EE, High DP and Low PA Scores Using the PT Sample Cut-Off Scores

	<i>N</i>	%	<i>p</i> -value	High Stress Phi	OR	95% CI
High EE (≥ 24)	182	77.8%	<.001	.441	11.6	8.24-16.22
High DP (≥ 5)	138	59.0%	<.001	.208	3.0	2.23-3.98
Low PA (≤ 40)	138	59.0%	<.001	.269	4.1	3.06-5.50
Burnout	82	35.0%	<.001	.318	6.6	4.67-9.43

Note. High stress ≥ 21 on the Perceived Stress Scale10. High EE, high DP, and low PA are based on the tercile scores of the PT sample. EE = emotional exhaustion; DP =depersonalization; PA = personal accomplishment; Burnout = high EE, high DP and low PA.

The relationships between high levels of perceived stress and high EE, high DP and low PA were also investigated using the definition of high EE (≥ 27), high DP (≥ 13) and low PA (≤ 31) according to Maslach and Jackson (1981). Results from a Pearson chi-square test indicate a moderate relationship, between high perceived stress and high EE X^2 (1, $N=159$)=57.75, $p<.001$, $\phi = .308$ (Table 12). Chi-square testing of high perceived stress and high DP suggests a weak relationship between the two variables, X^2 (1, $N=42$)=105.44, $p<.001$, $\phi = .192$. Similarly there is a weak relationship between high perceived stress and low PA, X^2 (1, $N=30$)=929.12, $p=.003$, $\phi = .186$. There is no meaningful relationship between high perceived stress

burnout, $\chi^2 (1, N=5)=9.12, p=.003, \phi = .083$ because the phi coefficient is less than one.

Table 12

Pearson Chi-Square Results, Odd Ratios (OR) and Confidence Interval (CI) for the Relationships Between High PSS Scores and High EE, High DP and Low PA Scores Using the Maslach Cut-Off Scores

	<i>N</i>	%	High Stress <i>p</i> -value	Phi	OR	95% CI
High EE (≥ 27)	159	67.9%	<.001	.443	10.4	7.59-14.30
High DP (≥ 13)	42	17.9%	<.001	.192	4.3	2.77-6.56
Low PA (≤ 31)	30	12.8%	<.001	.186	5.3	3.11-8.94
Burnout	5	2.1%	=.003	.083	6.0	1.60-22.57

Note. High stress ≥ 21 on the Perceived Stress Scale¹⁰. High EE, DP, PA scores and burnout are from "The measurement of experienced burnout," by C. Maslach and S. E. Jackson, 1981, *Journal of Occupational Behavior*, 2, pp. 99-113. EE = emotional exhaustion; DP=depersonalization; PA = personal accomplishment; Burnout = high EE, high DP and low PA.

Chapter V

DISCUSSION, CONCLUSIONS, AND RECOMMENDATIONS

Key Relationships, Patterns, and Themes

This paper presents the results of the first US national survey of stress and burnout in physical therapists (PTs). The key findings of this study are that, when the cutoff scores of Maslach and Jackson (1981) are used to characterize the subscales of burnout, PTs are experiencing emotional exhaustion at rates similar to physicians and nurses. PTs however, report far lower rates of depersonalization towards their clients, and a greater sense of personal accomplishment than physicians and nurses. It is beyond the scope of this study to explain why the findings may be different for PTs across three subscales of burnout (EE, DP, PA) compared to physicians and nurses. However, it can be speculated that there may be differences in the training and/or the practice of physical therapy that influence how PTs feel and think about their patients, and how their work provides experiences that reinforce a sense a personal accomplishment despite having EE at rates similar to

physicians and nurses. It is difficult to compare education and training across health care disciplines because they are often not well described, and the individual responsibilities for the provision of patient care are different. PTs for example, are trained and skillful in evaluating and assessing patients, prescribing a plan of care, and providing interventions that require direct hands-on work coupled with appropriate and correctly timed feedback. Physicians on the other hand, evaluate, diagnose and prescribe treatments, but except for surgery, do not routinely provide personal one-to-one interventions with their patients. Nurses provide direct patient care, however they most often provide services with direction from a physician. The process of examination, assessment and treatment that PTs provide with every patient during every visit, requires PTs to spend periods of time interacting with their patients that are generally longer than an average encounter with a physician or nurse. These differences may account for the lower rates of depersonalization and higher levels of personal accomplishment in PTs compared to nurses and physicians.

Although the development or progression of burnout has not been conclusively described, Golembiewsky et al. (1986) and Van Dierendonck et al. (2001) suggest that low PA and high DP precede feelings of high EE and burnout. From this perspective, PTs may be somewhat protected from burnout because of their low rates of high DP and low PA. On the other hand, Leiter and Maslach (1988) and Lee and Ashforth (1993) have reported that the

sequence of burnout begins with EE. The findings of this study, which include an emotional exhaustion rate of 25% when the Maslach cutoffs are applied, a moderately strong association between emotional exhaustion and high perceived stress, and a modestly strong relationship between high perceived stress and burnout, when the PT cutoff scores are applied, support the theory that high emotional exhaustion is associated with the development of burnout.

This study provides additional valuable information for advancing the study of burnout in physical therapy because it provides burnout subscale scores for PTs and challenges the pervasive use of the subscale cut-off scores established by Maslach and Jackson (1981). Those scores were established by dividing the scores of their original sample of 11,067 health care and social service providers into thirds. Applying the scores from that particular population, which did not even include PTs, does not take into account the different relationships, expectations and responsibilities required by different disciplines and specialties and thus, when burnout rates are determined for specific groups, they may not accurately reflect the level of burnout experienced. In addition, while the Maslach cutoffs have been generally applied in the literature, more recent data may be more relevant to current conditions and workers. When burnout in PTs is determined using the Maslach and Jackson (1981) cut-off scores, less than 1% of PTs have burnout. When cut-off scores specific for PTs are used to determine burnout, 13% of PTs have burnout. This percentage is more likely to be representative of the PT

sample, given the rate of high EE in PTs. Subsequent analyses and studies that include additional psychological tools and measurement of biomarkers can focus on the characteristics of PTs who are considered to have burnout and advance the understanding of the relationship between stress and burnout.

This study also provides, for the first time, information about perceived stress in PTs, and the relationship between perceived stress and burnout. The results indicate a moderately strong relationship between high perceived stress and high EE and a modest relationship between high perceived stress and burnout using cutoffs derived from the PT sample. Of the surveyed PTs, 78% who have high perceived stress have high EE and 35% are classified as having burnout. What is not clear, however, is whether these relationships are uni- or bi-directional. The questions of the Perceived Stress Scale are not specific to work, but ask about feelings of stress in general. It may be that personal factors, and not just work-related factors may contribute to burnout and/or that burnout or conditions at work may influence peoples' perception of stress in their personal and family lives. Different and more detailed questions, and perhaps qualitative research, about perceived sources of stress would be needed to further elucidate these potential relationships.

Given the moderately strong association between high perceived stress and emotional exhaustion, and the modestly strong relationship between high perceived stress and burnout, it could be speculated that some PTs in this

study might be headed toward burnout. The data from this study also indicate that although 78% of PTs with high perceived stress have high emotional exhaustion, only 50% of PTs who currently have burnout have high perceived stress. To determine with any certainty if some PTs in this study are headed for burnout or if once burnout is realized, feelings perceived stress will lessen, prospective studies that include additional psychological measures will need to be conducted.

Burnout.

Mean subscale scores. One way to compare EE, DP and PA across disciplines is to compare mean scores. The results indicate that PTs have lower mean EE and DP scores and higher PA scores than nurses, physicians and social service providers surveyed by Maslach and Jackson (1981). However, mean scores are not considered determinants of burnout. Rather, professionals need to have scores classified as high EE, high DP and low PA to fit the definition of burnout (Maslach & Jackson, 1981).

Categorization of burnout subscale scores.

Categorization based on the PT sample.

This study offers, for the first time, burnout cut-off scores for US PTs. When future research of PT burnout is conducted, calculating tercile values for the studied sample will be warranted. However, now researchers will be able to compare their tercile values and outcomes to values that are contemporary

and specific for PTs, rather than making comparisons to data that is more than thirty years old and reflects the status of physicians, nurses, and social service providers. Future researchers of burnout in PTs will be able to use the cut-off scores from their data and compare them to the cut-off scores from this study. If the tercile values are found to be different, then reasons for the difference such as geography, practice setting, and changing health care trends can be explored.

Using the approach suggested by Vanheule et al. (2007) of dividing the burnout subscales into thirds for the PT sample surveyed in this study, high EE was calculated to be ≥ 24 , high DP was ≥ 5 and low PA was ≤ 40 . When these cut-off scores were used to determine how many surveyed PTs fit the definition of burnout (high EE, high DP and low PA), 13% fit that criteria. This prevalence of burnout in PTs is consistent with burnout rates found in nurses and physicians. This is the first time cut-off scores have been identified for physical therapy, a health care profession that was not specifically identified or included by Maslach and Jackson (1981) and has received little attention in the stress and burnout literature.

It should be noted however, that when a sample is divided into thirds for determining the categorization of high, average and low EE, DP, PA, every sample will render approximately 33% with high EE, high DP, and low PA. This may not be useful for comparing across samples of different disciplines or nationalities, but it will be helpful for establishing expected scores within

specific disciplines and/or geographic regions. For example, if future researchers of burnout in PTs sample particular practice settings, the cutoff scores they obtain can be compared to the cutoff scores obtained from the national sample in this study. If differences in the cutoff scores were observed, the researchers would be able to explore factors within those practice settings, which might account for the different cutoff scores. Furthermore, even though the categorization of high EE, high DP and low PA is based on an arbitrary cut-off of 33%, the identification of those who have burnout is not arbitrary. People who are deemed to be experiencing burnout have met criteria across three different subscales. The categorization procedure of determining cutoff scores for samples being studied better reflects the demands of different professions and will be a more useful standard of burnout subscales scores than those established for a mixed group of professionals by Maslach and Jackson (1981). The results of this study provide subscale scores that can be applied or compared to in other studies of burnout in PTs.

Categorization according to Maslach and Jackson (1981).

Maslach and Jackson (1981), authors of the MBI-HSS, established categories of high, average and low scores for EE, DP and PA by dividing their sample ($N=11,067$) into thirds. Using these cut-off scores, 25% of the PTs surveyed in this study were found to have high EE, 8% have high DP and 7% have a low sense of PA. Burnout, defined as high EE, high DP, and low PA

was found in less than 1% of the surveyed PTs. This finding, which is low when compared to the results of studies of physicians and nurses (Afzal et al., 2010; Becker et al., 2006 Lesage et al., 2013), suggests that burnout may be under represented in PTs if the cut-off scores established by Maslach and Jackson (1981) are used to define burnout. This finding further supports the approach used in this study in which terciles are defined for a given population, in this case, the surveyed PTs.

Perceived stress.

This is the first national study of perceived stress in PTs. Because no large-scale studies of perceived stress in US physicians or nurses were identified, mean scores of the PTs surveyed in this study were compared the scores found in a national survey by Cohen and Janicki-Deverts in 2009. It was anticipated that mean PPS10 scores of PTs would be higher than a general US population because PTs are known to routinely encounter stressful situations in their work with people who are struggling with pain and disability. This however, was not the case. Mean PSS10 scores for male and female PTs were lower than the mean stress scores of the 2,000 Americans reported by Cohen and Janicki-Deverts (2012). Nevertheless, a few observations of Cohen and Janiciki-Devert's data (2012) should be taken into account when comparing these samples. In their study, people over the age of fifty-four were found to score lower on the PSS10 compared to younger people, and survey

respondents who were better educated (bachelor's degree and advanced degrees) scored lower than less educated adults on the PSS10. Given the fact that the percentage of PTs over the age of fifty-four is more than in the Cohen and Janicki-Devert sample (2012) and that 100% of the PTs surveyed have at least a bachelor's degree compared to 27% of the of Cohen and Janicki-Devert sample, the lower mean PT PSS10 scores may reflect the demographic distribution of the PT sample.

Regardless, when PSS10 scores are categorized as high based on scores greater than the 85th percentile (≥ 21), 15% of the surveyed PTs in this study were found to have high perceived stress. Because this is the first study of stress in PTs, it is difficult to know the impact high stress can have on the physical therapy profession and patient care. However, in studies of nurses and physicians using a variety of outcome measures for stress, high stress has been found to negatively affect patient care and the well-being of health care providers (Aiken, et al., 2002; Cimiotti, et al., 2012; Coffey & Coleman, 2001; Dyrbye et al., 2008; Estryn-Behar et al., 1990). These studies support the possibility that PTs with high perceived stress may be at an increase risk for illness and for providing compromised patient care.

Relationship between perceived stress and emotional exhaustion.

The results of this study indicate that PTs who have high perceived stress are twelve times more likely to have high EE than PTs who do not have high

perceived stress, and that over three-quarters of PTs who have high perceived stress also report high EE. These results support the claim by Maslach and Jackson (1981) that the EE subscale of burnout is indicative of emotional stress. It is unclear from the results however, if the relationship between perceived stress and burnout is uni- or bi-directional. High levels of perceived stress may affect reactions at work and/or challenging work conditions may be reflected in reports of high perceived stress. Either way, high perceived stress is likely to have impact in both home and work environments given the stress-response sequence model by Elliot and Eisendorfer (1982). This model suggests that stressors, whether personal or work-based, trigger biological and/or psychosocial reactions, and that these reactions are affected by personal modifiers and predicted consequences. Additional research is necessary to determine if strategies known to be helpful in managing perceived stress will also be helpful for reducing feelings of EE.

Exploration of relationship between perceived stress and depersonalization, personal accomplishment, and burnout.

The percent of PTs who have high stress and either high DP, low PA, or burnout are different, depending on the cut-off values used for the burnout subscales. When the PT cut-off scores are used, 59% of PTs with high perceived stress have high DP and low PA, and 35% of the PTs with high perceived stress fulfill the definition of having burnout. These percentages

reflect the fact that the PT cut-off scores were determined by dividing the PT scores into terciles, such that approximately one-third of the PTs would have high DP and one third would have low PA. When the Maslach and Jackson (1981) cut-off scores are used, only 18% have high DP, 13% have low PA and 2% have burnout. Nevertheless, the odds of PTs experiencing high DP, low PA and burnout are similar, whether the PT or Maslach and Jackson (1981) cut-off values are used. Using the PT cut-off values, PTs with high stress are three times more likely to have high DP, four times more likely to have low PA and seven times more likely to have burnout than PTs who do not have high stress. When the Maslach and Jackson cut-off values are used, PTs with high stress are four times more likely to have high DP, five more as likely to have low PA and six more likely to have burnout than PTs who do not have high stress. These findings indicate that although there is a modestly strong relationship between perceived stress and DP and PA, PTs with high perceived stress are not as likely to experience high DP or low PA as they are high EE.

Consistencies with Prior Research

Burnout.

Mean scores in Maslach Sample and Physicians. In this study, PTs were found to have a mean EE score of 19.04 (SD=11.30), a mean DP score of 4.48 (SD=4.55) and a mean PA score of 41.91 (SD=5.15). The

mean EE and DP scores are lower than the mean scores for social service providers, nurses and physicians studied by Maslach and Jackson (1981). In addition, the mean PA score for PTs is lower than mean score reported by Maslach and Jackson (1981). PTs also have lower EE and DP mean scores and higher PA scores than samples of US surgeons (Balch, et al., 2011; Yost, Eshelman, Raoufi, & Abouljoud, 2005).

Mean scores in Nurses. Mean scores for EE, DP and PA were determined in two national studies of nurses (Poghosyan, Clarke, Finlayson, & Aiken, 2010; Vahey, Aiken, Sloane, Clarke, & Vargas, 2004). Compared to the findings in these studies, the surveyed PTs in this study have lower mean EE and DP scores than US nurses and a higher PA score than nurses.

Mean scores in PTs. Mean subscale scores of surveyed PTs in this study are consistent with those reported by Wandling and Smith (1997), who surveyed PTs in the east north central region of the US (Illinois, Indiana, Michigan, Ohio and Wisconsin) (N=387). They found mean scores of 18.7 ($SD=9.3$), 5.4 ($SD=4.4$), and 41.8 ($SD=5.0$) for EE, DP, and PA, respectively. Donohoe et al. (1993), however, surveyed PTs in Massachusetts working in rehabilitation hospitals, and reported subscale means scores (EE=23.54 ($SD=10.70$), DP=7.63, ($SD=5.75$), PA=37.26 ($SD=8.48$) that are higher for EE and DP and lower in PA compared to the surveyed PTs in this study and those

surveyed by Wandling and Smith (1997). These observations may be due to the fact that Wandling and Smith (1997) surveyed PTs from a larger geographic region than did Donohoe and did not limit the PTs they surveyed to a particular practice setting (e.g. inpatient rehabilitation hospitals). The same is true for the surveyed PTs in this study who were not limited by geographic region or practice setting. It is difficult to determine if Donohoe's (1993) higher mean scores on burnout subscales reflected work conditions specific to Massachusetts and/or inpatient rehabilitation hospitals, or the earlier time period.

Categorization according to Maslach and Jackson (1981).

Categorization of EE, DP and PA scores into high, average and low has been reported in the literature using the cut-off scores established by Maslach and Jackson (1981). Utilizing those scores to define the PTs who were surveyed in this study, 29% were found to have high EE, 8% were found to have high DP, and 7% had low PA. Shanafelt et al. (2009) found that 32% of US surgeons had high EE. This finding is the same as the 32% of US surgeons who had high EE in the study by Balch et al. (2011), but different than the 50% of obstetrics and gynecology (ob-gyn) residents, who were found to have high EE in a study by Becker et al. (2006). Shanafelt's findings (2009) were also similar to the findings of Becker et al. (2006) in PA. Shanafelt et al. (2009) found 12.8% of surgeons to have a low sense of PA, whereas Becker et al. (2006)

found 13% of ob-gyn residents to have low PA. For the subscale of DP, Shanafelt's findings (26%) were consistent with Balch et al. (2011) who found 26% of surgeons to have high DP. Becker et al. (2006) reported that 12% of ob-gyn residents have high DP. In general, the percentage of PTs in this study with high EE is consistent with that of surgeons; however the rate of high DP is lower. The prevalence of low PA is 7% in PTs compared to 13% in surgeons and ob-gyn residents.

The percentages of high EE (29%), high DP (8%) and low PA (7%) found in the surveyed PTs of this study are not consistent with the results reported by Donohoe et al. (1993), which is the only identified study specific to PTs and in which percentages of high, average and low subscale scores were reported. Donohoe et al. (1993) surveyed staff PTs (N = 123) who worked in rehabilitation hospitals in Massachusetts and found that 46% and 21% had high EE and high DP respectively, and that 60% had low PA. The different results may reflect the fact that in this study, a national survey of PTs, was conducted across all practice settings, whereas Donohoe et al. (1993) surveyed PTs from a specific geographic region and practice setting. Donohoe et al. (1993) also performed an analysis of work factors in their study and suggested that efforts to address burnout should include making the job more challenging and less routine, and for resources for better time management and continuing education. If these factors were indeed associated with burnout, but are not currently concerns throughout the nation, then this could

be an explanation for the different high EE, high DP, and low PA scores in the two studies. It should be noted that the provision of physical therapy services has changed in the twenty years since the study by Donohoe et al. (1993) was published, including but not limited to greater autonomy for PTs, and different requirements for documentation and reimbursement. The findings of this study will reflect feelings of contemporary practice and will help address the paucity of information about burnout in PTs.

Reports of burnout. Burnout has been defined as having high EE, high DP and low PA on the MBI-HSS (Maslach & Jackson, 1981). When this definition, along with the cut-off scores for high EE, high DP and low PA established by Maslach and Jackson (1981) was applied to the PTs in this study, less than 1% of PTs were found to have burnout. Applied to physicians and nurses, Lesage et al. (2013) reported that 12% of French occupational physicians have burnout, Afzal et al. (2010) found 33% of American resident physicians have burnout and Becker et al. (2006) found that 7% of US ob-gyn residents have burnout. Nearly 11% of community mental health nurses in England & Wales were found to have burnout. None of the researchers who investigated burnout in PTs reported what percent of PTs had burnout according to this definition. The finding of this study, in which the percent of PTs who fit the definition of burnout is 1%, suggests that either the incidence of PTs with burnout is much lower than physicians or nurses, or that the cut-off

values in the mixed population are not applicable to PTs.

Some researchers have not used the high EE, high DP and low PA definition of burnout when reporting their results, even if they have used the cut-off scores established by Maslach and Jackson (1981). In several studies of burnout in physicians, investigators have defined burnout as having high EE or high DP. Kruere et al. (2007) reported that 28% of oncologic surgeons have burnout, whereas a few years later, Balach et al. (2011) found that 36% of oncology surgeons have burnout. Both studies defined burnout as having high EE or high DP. Shanafelt et al. (2009) and Balach et al. (2011) found other surgeons to have burnout rates of 39% and 40% respectively, whereas Waldman et al. (2009), reported that 80% of cardiology residents in Argentina have burnout, but none of these researchers used the definition of burnout as high EE, high DP and low PA. Many researchers who have investigated burnout in nursing have defined burnout as simply having high EE. In surveyed hospital nurses, burnout ranged from 33% to 54% (Aiken et al., 2002; Aiken et al., 2002; Felber, et al., 2011; McHugh et al., 2011). McHugh et al. (2011) and Felber et al. (2011) reported that 33% and 28% of nursing home nurses have burnout and Felber et al. (2011) reported a burnout rate of 24% for nurses working in home health care, but all of these researchers defined burnout as simply having high EE.

When fitting the criteria in all three subscales is used to report burnout in physicians and nurses, the percents range from 11% - 33%. When only one or

two of the burnout subscales are used to report burnout, percents range from 24% to 80%. Researchers who are reporting burnout rates, but are not using the definition of burnout to be high EE, high DP and low PA are overestimating burnout in the samples they are investigating. This type of reporting inflates the burnout rates and makes it difficult to compare burnout rates across professions.

If the Maslach and Jackson (1981) cut-off scores are used for determining high EE, DP, and PA, as they were in all the studies reporting on physician and nurse burnout, and the definition of burnout was high EE, or high EE or high DP, then 29% of the PTs surveyed in this study have burnout. If the more strict definition of burnout (high EE, high DP and low PA) is applied and if the Maslach and Jackson (1981) cut-off scores are used, 1% of PTs have burnout. When however, the tercile scores of the surveyed PTs in this study are used to define high EE, high DP, and low PA, 13% of the PTs have burnout. The prevalence rate of burnout in 13% of PTs is more consistent with the burnout rate of nurses and physicians. Given the fact that the Maslach and Jackson (1981) cut-off scores have remained unchanged in over thirty years, have been challenged by other researchers, (Schaufeli & Van Dierendonck, 1995) and likely reflect demands and work environments different from what PTs currently encounter, it is probably not appropriate to use the cut-off scores by Maslach and Jackson (1981) to determine burnout rates in PTs or any other profession. Rather, terciles scores should be calculated for each sample.

Perceived stress.

In this first national study of perceived stress in PTs, high perceived stress is defined as having a score ≥ 21 on the PSS10, which is equal to or higher than the 85th percentile of scores. The mean PSS10 score was found to be 14.08 ($SD=6.38$).

The PSS10 has been applied in studies of health care students and providers in Saudi Arabia, India, Israel, Argentina, and Australia, but only one large-scale study of US medical students (Reed, et al., 2011) and two small studies of nurses ($N=26$) and physicians ($N= 40$) in the US were identified (Cuneo, et al., 2011; Sood et al., 2011). Given the remarkable differences of stressors encountered by students compared to practicing health care providers, only studies of physicians and nurses will be discussed.

Many researchers have reported PSS10 results as mean scores rather than as percentages of high stress. In India, the mean PSS10 score was reported to be 18.28 ($SD=5.47$) for resident physicians (Swami et al., 2013). In Argentina, cardiology residents in were found to have a mean PSS10 score of 20.3 ($SD=7.4$), compared to non-resident university graduates who had a mean score of 16.7 ($SD=6.7$). Cuneo et al. (2011) found a mean of 17.2 ($SD=4.8$) in nurses. Mean PSS10 scores in the surveyed PTs ($M=14.08$, $SD=6.38$) are lower than residents and nurses in these studies. Rates of high perceived stress were not recorded in the studies that used the PSS10, so

comparisons to the PTs surveyed in this study cannot be made.

Relationship between perceived stress and burnout.

The purpose of this study was to investigate the prevalence of burnout and perceived stress in a national sample of PTs and to determine if high perceived stress is associated with burnout. The measurement of perceived stress was included in this study in a first attempt to explore personal factors that might be associated with burnout in PTs. Other researchers have indeed sought to identify factors that are present with, or contribute to, burnout. However, most have only investigated demographic and institutional factors. Shanafelt et al. (2009), Sharma et al. (2007), Balch et al. (2010) have provided demographic information about surgeons who have burnout. Becker et al. (2006) have reported demographic information about ob-gyn residents, and Afzal et al. (2010) described associations between race/ethnicity, primary language and cultural background, and burnout in medical residents. In a multi-national study of nurses, Poghosyan et al. (2010) reported demographic information about those who have burnout.

Some researchers have investigated institutional factors that may contribute to burnout. Studies of burnout in PTs have included factors of role ambiguity, mentorship, continuing education opportunities, staff resources, time constraints, and supportive communication with colleagues and supervisors (Balogun et al., 2001; Deckard et al., 1989; Donohoe et al., 1993;

Schlenz et al., 1995). Studies of burnout in physicians and nurses have included potential factors of institutional support, opportunities for professional growth, caseload size, and support from managers. (Coffey & Coleman, 2001; Felber et al., 2011; Vahey et al., 2004; Yost et al., 2005).

Some researchers of burnout have included measures of stress, physical and mental health in their studies, but have not tested the relationships between these scores and scores on the burnout subscales (Goodman & Scholing, 2012; Krasner et al., 2009; Waldman, et al., 2009). When the association of stress and burnout was investigated, high perceived stress was found to be correlated with high EE in physicians and medical students (El-Masry et al., 2013; Lesage et al., 2013; Morais et al. 2006). Additionally, Lesage, et al. (2103) found high perceived stress to be a risk factor for DP, and Morasi et al. (2006) found an association between high perceived stress and both DP and PA. None of the studies included information about the relationship between perceived stress and burnout (high EE, high DP and low PA).

The results of this study are consistent with the findings of El-Masry et al. (2013), Lesage et al. (2013) and Morasi et al. (2006), who found a correlation between high perceived stress and high EE. However, unlike the results of the studies by Lesage et al (2013) and Morasi et al (2006), the results of this study do not suggest a strong relationship between high perceived stress and DP. There are however, modest relationships between high perceived stress and

high DP and high perceived stress and low PA. In addition, the results of this study indicate a moderately strong correlation between high perceived stress and burnout, a relationship not tested by previous researchers.

Conclusions and Implications

Burnout.

Few studies of burnout in PTs have been published. Most have focused on particular practice settings or geographic areas and were published more than ten years ago. Stress has not been investigated in PTs and the effects of stress and burnout on PTs and their patients is not available. This study sought to determine the prevalence of stress and burnout in a national sample of PTs and to measure the relationship between the two as a first step for describing the well-being of physical therapists. The knowledge gained from this study can provide the foundation for future research into the impact of stress and burnout on the physical therapy profession, the health of PTs, and patient care.

The results of this study suggest that PTs have similar rates of high EE compared to physicians and nurses. When the Maslach and Jackson (1981) cut-off scores are applied, PTs have a high EE rate of 29%. This is comparable to the 32% rate of high EE found in two studies of US surgeons (Balach et al., 2011; Shanafelt et al., 2009) but less than the 50% rate found in

ob-gyn residents (Becker et al., 2006). The prevalence rate of high EE in nurses has been found to be 24% in those who practice in home health (Felber et al., 2011), 28% to 33% who work in nursing homes (Felber et al., 2011; McHugh et al., 2011), and 33% to 54% for hospital-based nurses (Aiken, et al., 2002; Poncet, et al., 2007). In all of these studies of physicians and nurses, the authors relied on the Maslach and Jackson (1981) cut-off scores.

What is interesting to note is that despite similar rates of high EE, the PTs in this study have lower rates of DP compared to physicians when the Maslach and Jackson (1981) cut-off scores are applied. PTs were found to have a prevalence rate of 8% for high DP whereas 26% of surgeons were found to have high DP. Of ob-gyn residents 12% had DP. These findings may be explained by the fact that the practice of physical therapy, surgery and ob-gyn care are all very different. Surgeons for example, often do not establish long-term relationships with patients, nor do they need to see patients with regular frequency and thus, may feel experience feelings of detachment and depersonalization to a greater degree than ob-gyns who engage with patients for longer episodes of care and with greater regularity. Like ob-gyns, PTs tend to see the same patient over several weeks or months, but unlike ob-gyns, often on a daily basis for hours at a time. These experiences may afford PTs with opportunities to engage with patients in ways that might mitigate feelings of cynicism and detachment.

The different demands, expectations, relationships and work settings

across different health care professions, and the results of this study, call to question the continued use of the Maslach and Jackson (1981) cut-off scores used to determine levels of EE, DP, PA, and burnout. In the future, tercile subscale scores should be calculated for large samples of health care professionals that share similar educational requirements and work requirements. The data from this study provides information about the tercile subscale scores for a national sample of PTs at this point in time.

Another issue in the reporting of burnout is the observation that many researchers do not use the accepted definition of burnout (high EE, high DP and low PA). Rather they report on one subscale score, usually EE, and claim a burnout rate based in the rate of high EE rather than burnout. Reporting only one subscale of burnout, does not reflect the actual state of burnout within a sample and in all instances inflates the rate of burnout within a sample. This information is misleading and limits comparisons of burnout rates across disciplines.

This study sought to survey a large number of PTs in a randomized, yet stratified manner, to achieve representation from the entire US. Previous studies of burnout in PTs, all of which were published more than ten years ago, used less controlled methods of collecting data and sampled specific geographic and/or practice settings. These differences likely account for the differences in the burnout subscale scores in this study compared to previous studies of burnout in PTs. Balogun et al. (2002), Donohoe et al. (1993), and

Schlenz et al. (1995), used samples of convenience rather than conduct randomized sampling. The surveys were either hand delivered or mailed to specific facilities for the therapists to complete. The authors did not report efforts to prevent respondents from speaking to each other about the survey, which may have created bias. For example, if therapists believed that work demands might be lessened if survey results indicated high staff burnout, then therapists may have been influenced to report inflated scores. This may have lead to an overestimation of burnout in PTs nationwide, especially if there were local or institutional factors that contributed to high rates of EE, DP and low PA. Indeed, Donohoe et al. (1993) found communication and time constraints to be issues at the rehabilitation hospitals and therapists sampled in the Balogun et al. (2002) study noted concerns with limited resources and time for professional development. Balogun et al. (2002) reported that perceived support from supervisors and colleagues were weakly, but significantly associated with lower EE and DP, and suggested that more investigation be done to identify work-related and sociodemographic factors that may mediate burnout.

Despite high rates of high EE, high DP and low PA in the earlier studies of burnout in PTs, none of the authors reported on the number or percent of PTs who met the criteria of burnout. Comparisons can be made however with physicians and nurses. Using the calculation of high, average and low subscales scores based on the surveyed PTs in this study, 13% were found to

have burnout. This percent is consistent with French occupational physicians (12%) (Lesage et al., 2013), community mental health nurses (11%) (Coffey & Coleman, 2001), and more than ob-gyn residents (7%) (Becker et al., 2006). Burnout in physicians and nurses is known to be associated with medical errors, health problems and poorer quality of care. Now that it has been established that rates of burnout for PTs are consistent with physicians and nurses, further research is warranted to fully explore the impact burnout on physical therapists and on patient care.

Stress and burnout.

Of the PTs surveyed in this study, 15% were found to have high perceived stress (≥ 21 on the PSS10) and high perceived stress was found to have a moderately strong correlation with burnout. PTs with high stress were found to be twelve times more likely to have high EE and seven times more likely to experience burnout than PTs who do not have high perceived stress. Determinants of perceived stress include responses to items on the PSS10 such as, “How often have you felt confident about your ability to handle your personal problems?” and “How often have you felt that you were unable to control the important things in your life?” These questions do not direct respondents to think specifically about work, however they do not preclude one from thinking about stresses associated with work. Items on the MBI-HSS, however, are specifically focused on feelings at work and include items such

as, “I feel used up at the end of the workday”, and “I feel frustrated by my job”.

The relationship between perceived stress (which includes reflections of personal, home, family and/or work stresses), and burnout, may indicate an influence of personal factors, and not just institutional factors, on the experience of burnout. However, the possibility that the relationship between perceived stress and burnout is bi-directional should not be overlooked.

Perhaps feelings of burnout can influence the perception of feeling stressed in one’s personal and family life. Indeed, a bi-directional relationship is supported by Lazarus and Folkman’s (1984) theory of stress and coping, and the stress-response sequence model proposed by Elliot and Eisdorfer (1982). Situations, in which the demands outweigh a person’s resources, can be considered stressful if the demands are perceived to threaten one’s goals. Work-related situations such as time constraints may interfere with assuring that all patients reach an independent functional status. At the same time, this situation may influence reports of perceived stress because for some individuals appraised threats at work may also threaten personal goals of providing for one’s family.

In contrast, some people may appraise the situation of time constraints as a challenge rather than a threat and use their perceived resources to adapt to the situation. This scenario, suggests that personal qualities (e.g. appraisal of threat vs. challenge, perceived resources) and not just institutional factors may influence the experience of burnout. Extending personal qualities to include perceived stress, the results of this study support models of stress-response

and coping, and the possibility that high perceived stress may influence one's appraisal of a situation and available resources.

Limitations

The actual number of licensed PTs in the US is difficult to ascertain because PTs can be licensed in multiple states and there is no central database of PTs. In addition, e-mail addresses of licensed PTs are not available from every state, making a nationwide on-line survey of all PTs impossible to conduct. Thus, this study included only PT members of the APTA because of the availability of realistic numbers and e-mail address. This is a limitation of the study and may threaten external validity because differences between APTA members and non-APTA members may exist. Further limitations are that only PTs who had their e-mail addresses published were surveyed, which may contribute to selection bias, and the response rate was 23%. An improvement in response rate may have been possible if the APTA posted information about the study on their website or encouraged completion of the survey through on-line newsletters..

The results from this study are limited in informing the proposed models of the chronological sequence of burnout. This is in part due to the cross-sectional design of the study and the questionnaire that was used. Only the MBI-HSS and the PSS10, and demographic questions were included in the questionnaire. In order to demonstrate a potential progression of burnout, a

longitudinal design is necessary and according to Te Brake et al. (2008) structural equation modeling should be employed. Van Dierendonck et al. (2001) have also suggested that specific questions related to the perception of the relationship between the professional and the recipients of care should be asked when investigating the chronological sequence of burnout.

A strength of this study is how the survey was conducted. The e-mails of randomly selected PTs were sent to Mind Garden, Inc. who then allowed only PTs who received an e-mail invitation to access the survey. This prevented entire physical therapy departments from completing the survey even though only one person received the e-mail invitation, which would have altered the randomization procedure. The software used by Mind Garden, Inc. also prevented PTs from completing the survey more than once and required completion of all questions before submission. This resulted in no missing data.

The use of Constant Contact, an e-mail delivery service, was helpful in being able to track e-mails that were and were not deliverable, and if recipients ignored or opened the email. By combining the functions of Constant Contact and Mind-Garden, Inc. participants and responses were able to remain anonymous.

Generalizations

This study is the first US national study of stress and burnout in PTs. The

results suggest that PTs experience high levels of perceived stress and rates of burnout similar to other health care providers. This study has provided cut-off scores for the burnout subscales for a large cohort of PTs, which can be used for comparison purposes in future research of burnout in PTs. In addition, the results of this study indicate a moderately strong relationship between high perceived stress and high EE, and modest relationships between high perceived stress and DP and high perceived stress and PA. The modest association of high perceived stress and burnout may indicate that one's personal life and not just work-related factors may contribute to burnout and/or that burnout at work may influence one's perception of stress at home.

Unanswered Questions and Recommendations

The results of this study have established the prevalence of stress and burnout and their relationship in PTs. Additional questions that have the potential to be answered with this data, are whether differences in perceived stress and burnout exist in different practice settings, age groups, and genders. Furthermore, questions can now be raised about the factors that contribute to stress and burnout, including personal and institutional conditions. Additional investigations into the relationship between perceived stress and burnout are also warranted if interventions to ameliorate high stress, burnout, or both are to be considered. In addition, since the association of stress and burnout with poorer quality of care, medical errors, health

problems and attrition has been established in medicine and nursing, attention should be given to the effects of burnout in physical therapy.

Summary

The results of this first US national study of stress and burnout in PTs suggest that PTs have high levels of perceived stress, and burnout rates similar to physicians and nurses. This knowledge and information about the relationship between perceived stress and burnout is valuable information for the physical therapy profession, especially for the APTA, an organization that supports and advocates for its membership in a variety of ways. The association of high perceived stress and burnout warrants further investigation to better understand the relationship between non-work related stressors captured on the PSS10 and feelings related to burnout at work as measured by the MBI-HSS. To more thoroughly examine this relationship, qualitative research techniques, including but not limited to open ended questions may need to be included in the design of future research.

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Appendix A

Perceived Stress Scale¹⁰

The questions in this scale ask you about your feelings and thoughts **during the last month**. In each case, you will be asked to indicate by circling *how often* you felt or thought a certain way.

Name _____ Date _____

Age _____ Gender (Circle): **M** **F** Other _____

0 = Never 1 = Almost Never 2 = Sometimes 3 = Fairly Often 4 = Very Often

- | | | | | | |
|--|---|---|---|---|---|
| 1. In the last month, how often have you been upset because of something that happened unexpectedly? | 0 | 1 | 2 | 3 | 4 |
| 2. In the last month, how often have you felt that you were unable to control the important things in your life? | 0 | 1 | 2 | 3 | 4 |
| 3. In the last month, how often have you felt nervous and "stressed"? | 0 | 1 | 2 | 3 | 4 |
| 4. In the last month, how often have you felt confident about your ability to handle your personal problems? | 0 | 1 | 2 | 3 | 4 |
| 5. In the last month, how often have you felt that things were going your way? | 0 | 1 | 2 | 3 | 4 |
| 6. In the last month, how often have you found that you could not cope with all the things that you had to do? | 0 | 1 | 2 | 3 | 4 |
| 7. In the last month, how often have you been able to control irritations in your life? | 0 | 1 | 2 | 3 | 4 |
| 8. In the last month, how often have you felt that you were on top of things? .. | 0 | 1 | 2 | 3 | 4 |
| 9. In the last month, how often have you been angered because of things that were outside of your control? | 0 | 1 | 2 | 3 | 4 |
| 10. In the last month, how often have you felt difficulties were piling up so high that you could not overcome them? | 0 | 1 | 2 | 3 | 4 |

Please feel free to use the *Perceived Stress Scale* for your research.

Mind Garden, Inc.

info@mindgarden.com

www.mindgarden.com

References

The PSS Scale is reprinted with permission of the American Sociological Association, from Cohen, S., Kamarck, T., and Mermelstein, R. (1983). A global measure of perceived stress. *Journal of Health and Social Behavior*, 24, 386-396.
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Appendix B

Perceived Stress Scale10 Norms

Category	1983			2006			2009		
	N	Mean	SD	N	Mean	SD	N	Mean	SD
Entire Sample	2270	13.02	6.35	2000	NR	NR	2000	NR	NR
Gender									
Female	1344	13.68	6.57	1034	16.10	7.73	1032	16.14	7.56
Male	926	12.07	5.89	966	14.46	7.81	968	15.52	7.44
Age									
Less than 25	349	14.54	5.95	137	18.64	7.24	223	16.78	6.86
25-34	593	13.45	6.45	331	17.78	7.19	433	17.46	7.31
35-44	453	12.94	6.02	396	16.72	6.99	331	16.38	7.07
45-54	285	12.67	6.09	540	15.20	8.24	419	16.94	7.83
55-64	282	11.89	6.94	347	13.41	7.29	372	14.50	7.20
65 & older	296	11.98	6.31	249	10.80	7.19	222	11.09	6.77
Race									
White	1924	12.80	6.23	1716	15.16	7.81	1704	15.70	7.51
Black	176	14.67	7.17	99	16.44	7.52	99	15.68	7.51
Hispanic	98	13.98	6.85	86	15.78	7.79	81	17.00	7.45
Other	50	13.96	5.31	63	17.32	8.59	84	17.44	7.67

Category	1983			2006			2009		
Education									
Less than HS	369	14.32	6.73	76	17.55	7.77	62	19.11	7.92
High school	799	13.10	6.70	516	16.38	7.69	404	16.59	7.76
Some college	555	13.15	6.24	856	15.57	7.96	784	16.00	7.54
Bachelor's degree	399	12.07	5.51	365	13.71	7.42	513	15.17	7.22
Advanced degree	142	11.41	5.20	183	13.23	7.32	231	14.65	7.14
Employment									
Full-time	1227	12.38	5.84	1108	15.22	7.53	1037	16.23	7.31
Part-time	250	14.32	6.61	196	15.86	7.10	167	15.32	7.28
Unemployed	123	16.46	6.28	77	20.21	8.38	187	16.62	6.97
Retired	280	11.68	6.43	311	11.50	7.40	282	12.34	7.63
Homemaker	256	12.87	6.80	144	16.93	7.95	156	15.79	7.33
Other	113	16.76	6.97	140	18.64	7.66	159	18.99	7.57
Income (2009\$)									
≤ \$25,000	369	15.57	7.03	424	17.08	7.88	313	17.77	7.60
\$25,000-35,000	303	14.06	6.25	167	16.04	7.88	367	16.69	7.72
\$35,001-50,000	512	12.79	6.16	516	15.34	7.55	191	16.37	8.27
\$50,001-75,000	426	11.86	5.88	479	14.90	7.44	418	15.26	7.54
≥ \$75,001	478	11.80	5.44	414	13.62	8.07	711	14.74	6.88

Appendix C

Maslach Burnout Inventory-Human Services Survey

For use by Ellen Anderson only. Received from Mind Garden, Inc. on October 20, 2011

MBI-Human Services Survey

How often:	0	1	2	3	4	5	6
	Never	A few times a year or less	Once a month or less	A few times a month	Once a week	A few times a week	Every day

How Often
0-6

Statements:

1. _____ I feel emotionally drained from my work.
2. _____ I feel used up at the end of the workday.
3. _____ I feel fatigued when I get up in the morning and have to face another day on the job.
4. _____ I can easily understand how my recipients feel about things.
5. _____ I feel I treat some recipients as if they were impersonal objects.
6. _____ Working with people all day is really a strain for me.
7. _____ I deal very effectively with the problems of my recipients.
8. _____ I feel burned out from my work.
9. _____ I feel I'm positively influencing other people's lives through my work.
10. _____ I've become more callous toward people since I took this job.
11. _____ I worry that this job is hardening me emotionally.
12. _____ I feel very energetic.
13. _____ I feel frustrated by my job.
14. _____ I feel I'm working too hard on my job.
15. _____ I don't really care what happens to some recipients.
16. _____ Working with people directly puts too much stress on me.
17. _____ I can easily create a relaxed atmosphere with my recipients.
18. _____ I feel exhilarated after working closely with my recipients.
19. _____ I have accomplished many worthwhile things in this job.
20. _____ I feel like I'm at the end of my rope.
21. _____ In my work, I deal with emotional problems very calmly.
22. _____ I feel recipients blame me for some of their problems.

(Administrative use only)

EE: _____ cat: _____ DP: _____ cat: _____ PA: _____ cat: _____

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Appendix D


Maslach Burnout Inventory-Human Services Survey Norms

		Emotional Exhaustion (EE)		Depersonalization (DP)		Personal Accomplishment (PA)	
Variable	N	Mean	SD	Mean	SD	Mean	SD
Entire Sample	11,067	20.99	10.75	8.73	5.89	34.58	7.11
Gender							
Female	3421	20.99	10.66	7.02	6.34	36.50	6.56
Male	2247	19.86	10.47	7.43	5.99	36.29	6.76
Age							
Less than 30	1044	23.86	11.23	9.36	9.06	35.91	6.58
31-40	1197	22.26	10.78	8.25	6.05	37.26	6.63
41-50	641	20.24	11.06	6.66	5.56	38.19	7.67
51 & older	624	17.96	10.93	5.29	5.09	38.41	6.90
Race							
White	1511	23.14	11.39	8.86	6.38	37.12	6.85
Black	199	17.80	10.53	5.19	5.01	37.62	7.10
Asian-American	32	25.03	13.61	10.58	7.96	34.75	7.78
Other	93	19.92	10.83	8.11	5.71	36.17	7.99
Education							
No college	269	22.99	11.77	8.57	6.86	36.54	6.97
Some college	664	21.32	11.29	8.00	6.54	35.33	6.66
Completed college	664	19.08	9.97	7.49	5.70	31.48	6.95
Postgrad work	1878	21.13	10.74	7.35	5.67	37.88	6.42

		Emotional Exhaustion (EE)		Depersonalization (DP)		Personal Accomplishment (PA)	
Marital Status							
Single	732	24.28	11.19	9.35	6.43	35.89	6.71
Married	2017	19.95	10.63	7.04	6.02	38.04	6.74
Divorced	478	22.29	11.19	7.75	5.97	37.22	6.73
Other	281	23.01	12.36	7.34	6.43	37.30	7.01

Appendix E

Invitation Letter to Participate in the Study


RUTGERS School of Health Related Professions

November, 2013

Dear Ellen,

My name is Ellen Zambo Anderson and I am a physical therapist conducting research at Rutgers School of Health Related Professions. My research interests include job-related issues, stress, health & wellness, and strategies for managing stress that could be incorporated into physical therapy practice.

The effects of stress and burnout in nursing and medicine have been well studied, but little is known about physical therapy because there has never been a national survey of physical therapists in this area.

Please participate in a national online survey to document levels of stress, burnout and wellness in physical therapists.

The survey will take less than 10 minutes to complete. The data will be submitted to a secure account managed by Mind Garden, Inc. who will suppress names and e-mail addresses from the survey responses. This will ensure that I have access to the response data, but not any identifiable information. Your responses will be completely confidential.

As an incentive, physical therapists who complete a survey will be entered into a random drawing for a \$100.00 Cash Card. The winner will be notified by e-mail after completion of the data collection period.

The deadline to complete the survey is Wednesday, November 27, 2013.

By selecting the "I consent to participate" survey link, you are agreeing to participate in this study.

["I consent to participate"](#)

If you have any questions or comments regarding this survey please contact me at 973-972-0475 or andersez@shrp.rutgers.edu. If you have questions about your rights as a research subject, please call the Newark Campus IRB Director at 973-972-3608.

Thank you for helping me document issues related to stress, burnout and wellness in the physical therapy profession.

Sincerely,

Ellen Zambo Anderson, PT, MA, GCS
Rutgers School of Health Related Professions

Phone: 973-972-0475
 Email: andersez@shrp.rutgers.edu

 **SafeUnsubscribe™**

This email was sent to andersez@shrp.rutgers.edu by andersez@shrp.rutgers.edu | [Update Profile/Email Address](#) | Rapid removal with [SafeUnsubscribe™](#) | [Privacy Policy](#).



Appendix F

IRB Approval



**** This is an auto-generated email. Please do not reply to this email message.
The originating e-mail account is not monitored.
If you have questions, please contact your local IRB office or log into eIRB.Rutgers.edu ****

DHHS Federal Wide Assurance Identifier: FWA00003913

IRB Chair Person: Robert Fechner

IRB Director: Carlotta Rodriguez

Effective Date: 1/9/2014

eIRB Notice of Approval

STUDY PROFILE

Study ID: [Pro2013003404](#)

Title: Stress and Burnout in Physical Therapists

Principal Investigator:	Ellen Anderson		
Co-Investigator(s):	Susan Gould-Fogerite Adam Perlman		
Sponsor:	Department Funded	Approval Cycle:	Twelve Months
Risk Determination:	Minimal Risk	Device Determination:	Not Applicable
Review Type:	Expedited	Expedited Category:	7
Subjects:	10000		

CURRENT SUBMISSION STATUS

Submission Type:		Research Protocol/Study		Submission Status:		Approved	
Approval Date:		1/8/2014		Expiration Date:		1/7/2015	
Pregnancy Code:	No Pregnant Women as Subjects	Pediatric Code:	No Children As Subjects	Prisoner Code:	No Prisoners As Subjects		

Protocol:	Study Protocol: Stress & Burnout in Physical Therapists	Recruitment Materials:	Invitation e-mail
------------------	---	-------------------------------	-------------------

*** Study Performance Sites:**

Rutgers 65 Bergen St. SSB Newark, NJ

Mind Garden, Inc. 855 Oak Grove Ave., Suite 215 Menlo Park, CA 94025

ALL APPROVED INVESTIGATOR(S) MUST COMPLY WITH THE FOLLOWING:

1. Conduct the research in accordance with the protocol, applicable laws and regulations, and the principles of research ethics as set forth in the Belmont Report.
2. **Continuing Review:** Approval is valid until the protocol expiration date shown above. To avoid lapses in approval, submit a continuation application at least eight weeks before the study expiration date.
3. **Expiration of IRB Approval:** If IRB approval expires, effective the date of expiration and until the continuing review approval is issued: **All research activities must stop unless the IRB finds that it is in the best interest of individual subjects to continue. (This determination shall be based on a separate written request from the PI to the IRB.) No new subjects may be enrolled and no samples/charts/surveys may be collected, reviewed, and/or analyzed.**
4. **Amendments/Modifications/Revisions:** If you wish to change any aspect of this study, including but not limited to, study procedures, consent form(s), investigators, advertisements, the protocol document, investigator drug brochure, or accrual goals, you are required to obtain IRB review and approval prior to implementation of these changes unless necessary to eliminate apparent immediate hazards to subjects.
5. **Unanticipated Problems:** Unanticipated problems involving risk to subjects or others must be reported to the IRB Office (45 CFR 46, 21 CFR 312, 812) as required, in the appropriate time as specified in the attachment online at: <http://rbhs.rutgers.edu/hsweb>
6. **Protocol Deviations and Violations:** Deviations from/violations of the approved study protocol must be reported to the IRB Office (45 CFR 46, 21 CFR 312, 812) as required, in the appropriate time as specified in the attachment online at: <http://rbhs.rutgers.edu/hsweb>
7. **Consent:** The IRB has reviewed and approved the consent waiver and/or alteration described in this protocol as required by 45 CFR 46 and 21 CFR 50, 56, (if FDA regulated research). Only the versions of the documents included in the approved process may be used to document informed consent of study subjects; each subject must receive a copy of the approved form(s); and a copy of each signed form must be filed in a secure place in the subject's medical/patient/research record.
8. **Completion of Study:** Notify the IRB when your study has been stopped for any reason. Neither study closure by the sponsor or the investigator removes the obligation for submission of timely continuing review application or final report.
9. The Investigator(s) did not participate in the review, discussion, or vote of this protocol.

CONFIDENTIALITY NOTICE: This email communication may contain private, confidential, or legally privileged information intended for the sole use of the designated and/or duly authorized recipients(s). If you are not the intended recipient or have received this email in error, please notify the sender immediately by email and permanently delete all copies of this email including all attachments without reading them. If you are the intended recipient, secure the contents in a manner that conforms to all applicable state and/or federal requirements related to privacy and confidentiality of such information.

Appendix G
Distribution of Physical Therapists by State

State	Distribution of PTs	% of Distribution	Number of PTs who received invitation
AK	283	0.48	31
AL	483	0.82	53
AR	317	0.54	35
AZ	1194	2.03	132
CA	5401	9.19	597
CO	1331	2.26	147
CT	827	1.41	91
DE	285	0.48	32
DC	215	0.37	24
FL	2715	4.62	300
GA	1286	2.19	142
HI	264	0.45	29
IA	813	1.38	90
ID	454	0.77	50
IL	2600	4.42	288
IN	1046	1.78	116
KS	607	1.03	67
KY	792	1.35	88

State	Distribution of PTs	% of Distribution	Number of PTs who received invitation
LA	779	1.33	86
MA	1589	2.70	176
MD	1128	1.92	125
ME	380	0.65	42
MI	1896	3.23	210
MN	1388	2.36	153
MO	1055	1.79	117
MS	407	0.69	45
MT	451	0.77	50
NC	1588	2.70	176
ND	278	0.47	31
NE	780	1.33	86
NH	362	0.62	40
NJ	1923	3.27	213
NM	363	0.62	40
NV	404	0.69	45
NY	3925	6.68	434
OH	1880	3.20	208
OK	534	0.91	59
OR	1040	1.77	115
PA	3311	5.63	366

State	Distribution of PTs	% of Distribution	Number of PTs who received invitation
RI	275	0.47	30
SC	742	1.26	82
SD	311	0.53	34
TN	1127	1.92	125
TX	3056	5.20	338
UT	642	1.09	71
VA	1814	3.09	201
VT	251	0.43	28
WA	2030	3.45	224
WI	1641	2.79	181
WV	377	0.57	37
WY	177	0.30	20

Appendix H

Demographic Questions

1. Please indicate your gender
 - Male
 - Female
 - Transgender
2. Please indicate your age in years at your last birthday
_____ years
3. Which best describes your race and ethnicity (you may select more than one)
 - Hispanic or Latino
 - American Indian or Alaska Native
 - Asian
 - Black or African American
 - Native Hawaiian or Other Pacific Islander
 - White
4. What is the highest earned degree you hold in any area of study? (select only one)
 - Baccalaureate degree
 - Master's degree
 - DPT
 - PhD (or equivalent, e.g. EdD, ScD)
 - PhD (or equivalent) and DPT
5. Using 35 or more hours/week as the definition of "full-time", which one of the following best describes your current employment status as a physical therapist?
 - Full-time salaried
 - Part-time salaried
 - Full-time self-employed
 - Part-time self-employed
 - Full-time hourly
 - Part-time hourly
 - Retired
 - Unemployed
6. Which of the following best describes the type of facility in which you currently do all or most of your work?

- Acute care hospital
- Inpatient sub-acute unit or facility
- Health system or hospital based outpatient facility
- Private outpatient office
- SNF/ECF/ICF
- Patient's home
- School system
- Academic institution (post-secondary)
- Industry
- Health and wellness facility
- Research center
- None

7. Years of experience as a physical therapist
_____ years
8. Years in current position (if currently employed as a physical therapist)
_____ years