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**The Dissertation Committee for Jeremy Capello certifies that this is the approved
version of the following dissertation:**

**AN EVALUATION OF THE DOCTOR INTERACTIVE
GROUP MEDICAL APPOINTMENT: ASSESSING
CHANGES IN HEALTH BEHAVIORS ATTRIBUTED TO
AN INTEGRATED HEALTHCARE MODEL.**

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**An Evaluation of the Doctor Interactive Group Medical
Appointment: Assessing changes in health behaviors
attributed to an integrated healthcare model.**

by

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Dedication

This dissertation is dedicated with much love and unending gratitude to my patient and loving partner in crime and all affairs of the heart, Carl Daniel Welder. He has been my biggest fan throughout all of this. He has kept me grounded while reaching for the stars. Carl, you are my true north. Thank you, my love.

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**An Evaluation of the Doctor Interactive Group Medical
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attributed to an integrated healthcare model.**

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This dissertation investigated the effect of a Doctor Interactive Group Medical Appointment (DIGMA), a unique multidisciplinary medical treatment modality, upon the health behavior of hypertensive patients at the Veterans Health Administration Outpatient Clinic (VA-OPC) in Austin, Texas. Health behavior modification, differences in stress perceptions, blood pressure changes due to the intervention and differences in coping strategies were assessed.

Integrated healthcare utilizes a multidisciplinary approach in considering physiological and psychological aspects of health, promoting patients to act on their own behalf in managing health. Increased healthcare costs, decreased patient satisfaction of care received and practitioner satisfaction in care provided currently afflict primary healthcare. Earlier, a “drop-in” shared medical appointment aimed to improve continuity of care, and increase patient and physician satisfaction by allowing patients better access to physicians without taxing more resources. Contrasting the “drop-in” model, this study examined the efficacy of a multi-session DIGMA. Functioning as an adjunct to hypertensive management, participants attended 5 sessions, including one introduction meeting, three consecutive weekly group sessions and an individual telephone session occurring one week following the intervention.

The study utilized a pretest/posttest design, with participants acting as their own controls. Self-report measures and blood pressure readings were administered prior to the onset, and again at termination of the DIGMA program. Analyses of variance and hierarchical regression models helped reveal any significant changes in health behaviors, perceptions of stress, and coping styles related to hypertension among 58 participants occurring over time for 7 distinct cohorts participating in the DIGMA. Findings revealed significant differences in both systolic and diastolic blood pressure readings between pre and post intervention. Significant changes in health promoting behaviors among participants who successfully completed all components of the program were also detected. In addition, adaptive coping strategies were found to significantly impact components of health behaviors. Qualitative information supports the quantitative data in

determining whether the agent of change is the group process itself, the information imparted in the group, or some other variable. Findings reveal the dynamic of the group, as well as the modality in which information was conveyed positively influenced health behavior changes. Results, implications, and limitations of the study as well as future directions are discussed.

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Chapter 1: Introduction

Health Psychology has helped foster successful professional relationships among the fields of medicine and behavioral health. The group medical appointment is one of several innovations originating from the integration of primary care and health psychology. In 1996, Edward Noffsinger, PhD developed the Drop-in Group Medical Appointment (DIGMA) in response to issues challenging primary healthcare. The initial aim of the DIGMA was to lessen healthcare costs by permitting physicians to care for more patients without using more resources. Subsequently, increasing access and improving continuity of care brought forth by the DIGMA would improve patient and physician satisfaction (Gordon, 2001).

Since the advent of the managed healthcare system in the U.S., primary care has served as a gatekeeper of healthcare referrals (Mechanic, Rogut, Colby, & Knickman, 2005). Based on the task assigned to this field of medicine, primary care is inundated with difficulties in effective patient care and decreases in efficiency in spite of increases in prevalence of chronic conditions and healthcare expenses (Mechanic et al., 2005). While primary care settings are intended largely for medical interventions, approximately 75% of all primary care visits also address some sort of mental health concern (Levant, 2005). Many people with mental health problems first present themselves during a primary care visit (American Academy of Family Physicians, Policies on Health Issues, 2004; Seaburn, Lorenz, Gunn, Gawinski & Mauksch, 1996), yet they infrequently receive treatment befitting their problem (Seaburn et al, 1996).

Integrated healthcare allows for multiple aspects of health from the physiological to the psychological, suggesting more comprehensive integration among disciplines and in some cases providers with diverse training are parts of a single treatment team (Blount, 2003; Pruitt, Klapow, Epping-Jordan, & Dresselhaus, 1998). Integrated care further proposes a shift not only in the delivery of health services but also in patient health practices (Dyer, Levy & Dyer, 2005). The desired outcome is that individuals will adopt behavioral practices that allow for better self-management of health. As such, a major paradigm shift would result, as patient and provider would partner together to ameliorate health maintenance, both sharing in communication and knowledge as well as becoming proactive in attaining desired health outcomes.

Background

Considering the health of the whole person is not a new concept. In 1977, Engel introduced the Bio-psychosocial perspective to the healthcare fields in reaction to the biomedical model pervasive among the medical profession. Engel (1977) reveals that the biomedical model posits that disease can be broken down into “measurable biological variables” (Engel, 1977). Engel (1977) indicates that the biomedical model leaves out the possibility of psychosocial factors such as influences of stress and coping mechanisms as having any impact on health. The Bio-psychosocial model recognizes these additional factors in the mission to understand how disease affects both physical and psychosocial aspects of individuals.

Caring for individuals with a more holistic approach has proven challenging within the current healthcare system, particularly so for treating patients with chronic

conditions. Health care providers struggle with the time constraints placed upon them by large caseloads (Gray, Brody, & Johnson, 2005; Mechanic, 2005). Chronic health conditions represent half of the entire global disease burden (Epping-Jordan, 2005). Veterans Administration healthcare system figures from 1999 indicate that healthcare expenditures totaled \$14.3 billion dollars. Furthermore, 2003 figures from this healthcare system illustrate that 72% of patients with common chronic diseases accounted for 96% (\$13.7 billion) of this total. Of all the chronic disorders, hypertension was found to be the most common (Yu, Ravelo, Wagner, Phibbs, Bhandari, Chen & Barnett 2003).

It is common for those suffering from chronic health conditions to require more time with a healthcare provider than the standard 15 to 20 minute visit. In the present healthcare environment, the overall health of the population would profit from the integration of behavioral health and primary care (Friedman, Sobel, Myers, Caudill, & Benson, 1995; Trotto, 1999).

In the past, disease management programs have worked from the biomedical perspective, with little or no emphasis put upon mental health issues (Cummings, 2003) such as appraisals of stress and coping (Lazarus & Folkman, 1984). However, interventions encouraging stress-management, nutrition and exercise have more recently become a vital part in the successful management of chronic health problems (Ornish, 1984; Gonder-Frederick, Cox & Ritterband, 2002; Levant, 2005).

Purpose

Addressing the physiological and psychosocial concerns of individuals who undergo less acute health concerns in a manner appropriate to their health requirements would enhance healthcare efficiency (Epping-Jordan, 2005; Nicasso, Meyerowitz, & Kerns, 2004). The group medical appointment is one example of a model germane to delivering care to chronic health sufferers. Group facilitators can help group members explore ways to beneficially alter health behaviors, and group members can learn tips from one another, as well as validating individuals' struggles with their chronic health concerns.

In the past, the prevailing opinion was that most disorders were caused by organic origin. This position prompted the medicine field to adopt a biomedical outlook towards providing care. This perspective endorsed a dualistic and divergent belief between one's physical and emotional selves. During the past few decades, the etiology of disorders has changed (Blount, 1998; Gatchel & Oordt, 2003). Whereas disorders in the past were more acute in nature, today, chronic illness is more ubiquitous (Gatchel, et al., 2003).

One such chronic condition more evident today is hypertension. This disorder is defined as a chronic elevation in blood pressure, with systolic blood pressure of 140 mm Hg or greater or diastolic blood pressure of 90 mm Hg or greater (Joint Committee on Detection, Evaluation and Treatment of High Blood Pressure [JNC VI], 1997). In the United States, over 50 million adults suffer from hypertension, and the percentage receiving treatment for this disorder is approximately 55% (Archives of Internal Medicine, 1997). Furthermore, the World Health Organization estimates that

hypertension causes one in eight deaths worldwide, making it the third leading cause of mortality today (Kottke, T.E., Stroebel, R. J., & Hoffman, 2003). Hypertension is extremely common in older Americans, illustrating that as age increases, so does its prevalence (1997). Additionally, hypertension exists with 60% prevalence for White Americans, 71% for African Americans and 61% for Latinos (American Medical Association, 1997). The percentage of hypertensive individuals with an average below 140/90 mmHg is approximately 29%, illustrating that almost three fourths of this population is not able to control their illness, even with medication therapy (Gatchel & Oordt, 2003). Particularly for older populations, systolic blood pressure is a stronger predictor of serious cardiac disorders such as coronary heart disease, heart failure and stroke than diastolic blood pressure (Gatchel, et al., 2003). Nearly 95% of all hypertension is of unknown cause, and is labeled as essential, benign, or primary. This type of hypertension is distinguished from secondary hypertension, which denotes elevation in blood pressure in relation to other disorders (2003).

Based on the shift from acute to chronic health conditions, it is important to move beyond the biomedical approach and address the impact that psychosocial elements may bear upon one's chronic health concerns (Blount, 1998). Our society demands that the field of healthcare address the needs brought forth by the persistent escalation of chronic health conditions such as hypertension. Furthermore, based on our changing healthcare needs, it is essential to continue to move towards integrating healthcare. Therefore, the overarching aims of this study are to address individuals' health concerns from a biopsychosocial perspective, as well as foster an environment that enlists practitioners

from both primary care and behavioral health fields to provider healthcare in a synergistic manner. It is anticipated that these goals would be achieved through the utilization of a group medical appointment that is geared to treat individuals encountering hypertension.

The objective of this dissertation is to investigate whether changes in health promoting behavior in relation to treatment of hypertension can be attributed to the DIGMA program. Of additional interest is to determine whether there are psychosocial correlates to any observable behavior changes. Specifically, the construct of perceptions of stress and coping mechanisms in relation to their disease will be assessed, as well as the effect of an individual's locus of control upon making behavior modifications.

Stressors are events such as health concerns that potentially result in change whereas mediators are coping resources and strategies that may help modify the stressful event. Coping resources are psychological and physical capacities to deal with stress whereas coping strategies are cognitive, affective, and behavioral means employed to handle a stressful situation (Lazarus & Folkman 1984). Coping responses arise when one perceives that demands of a stressful event are greater than their resources (Folkman, et al., 1986). Perceptions of stress are essential for determining how one may or may not develop responses to it. Lazarus & Folkman (1984) describe two types of cognitive appraisals that include a primary appraisal consisting of a particular event posing a threat to the individual, and a secondary appraisal comprised of one's perceived capacity for handling the potential stressor.

It is apparently not enough to expose patients to ideas about healthy behavior. Some thoughts have been generated regarding the underlying agents of behavior change.

Stress and coping are vital to the connection between the mind and body. More specifically, one's perceptions of stress and the subsequent ability to cope with it are believed to influence the prevalence of chronic disorders such as hypertension. Many patients in the Veteran's Administration Healthcare system mirror the population of individuals suffering from hypertension. Furthermore, individuals in this system are retired, and as their health declines, so do their social contacts to share experiences with. The group modality of the DIGMA fosters active engagement with one's health by building relationships between healthcare providers and patients. Furthermore, the group environment allows patients to discuss healthcare topics in a social environment. Thus, in addition to improving efficiency through integrated healthcare provisions, it is anticipated that the DIGMA group format as proposed in this study will help generate positive health outcomes among participants.

Chapter 2: Review of the Literature

This literature review aims to provide a thorough description of the proposed hypertension focused DIGMA program and to discuss relevant theories and research. The first section of the review will introduce the previously dominant medical healthcare paradigm as well as the current paradigm. In addition, influences of both models upon current healthcare practices will be discussed. This section will additionally explore the currently shifting characteristics of disease type and prevalence as well as the rise of managed care in light of these changes. Furthermore, aspects of chronic disease progression such as prevalence and cost will be addressed. In addition, this section will introduce the concept of integrated healthcare and its origins.

The second section of this literature review will assess the need for addressing psychosocial variables among persons encountering chronic illnesses. Furthermore, the role of the health psychologist in the face of the changes within healthcare is discussed.

The third section covers the psychosocial construct of one's locus of control and its impact upon health behaviors, as well as discussing agents of change and their impact upon adoption of health behavior changes. Additionally, the constructs of stress and coping and their influence upon health behaviors are discussed in this section of the literature review. Furthermore, this section of the literature review will address the construct of social support and its connection with levels of stress.

The last section of the review will examine the movement of healthcare towards preventive medicine and its impact upon promoting beneficial health practices. Further, this last section will examine the origins and framework of existing models that employ

group medical designs, as well as argue for a need to expand the existing models in order to utilize as a tool for promoting integrative healthcare and preventive medicine.

Contemporary Environment of Healthcare

Two established functions of medicine are to prevent disease from occurring and to cure disease once it has occurred (Ornish, 1984). In the past two decades there has only been one prominent principle dictating the approach in which diseases are treated. In 1977, Dr. George Engel, explained that a biomedical model suggests that disease can be broken down into “measurable biological variables” (Engel, 1977). Engel (1977) indicates that the biomedical model omits the possibility of psychological or social aspects as having any effects on health. The biomedical model excludes psychosocial variables and behavioral dimensions of illness and assumes that disease can be fully explained by deviation from the norm of measurable, biological variables. This model not only demands that disease be handled as an entity separate from social behavior, it also requires that behavioral aberrations be rationalized “on the basis of disordered somatic processes” (p.130). Thus, the biomedical model supports reductionism, the doctrine that complex phenomena stem from a single primary principle, and mind-body dualism, the philosophic belief that separates the mental from the physical self. According to Engel, a reductionist viewpoint describes that the only theoretical means available to characterize and study biological systems are physical in nature (1977). Engel puts forth that “In science, a model is revised or abandoned when it fails to account adequately for all the data. A dogma...requires that discrepant data be forced to fit the

model or be excluded” (1977). Biomedical dogma demands that all disease, including “mental” disease, be viewed in terms of aberrance of underlying physical systems (1977). Thus, the biomedical stance allows for only two alternatives in which disease and behavior are reconciled: the reductionist, stating that all behavioral occurrence of disease must be viewed in terms of physical bases; and the exclusionist, which describes that anything not capable of being explained by physical origin must be excluded as a disease (1977). Engel asserts that the biomedical viewpoint regards specific biochemical deviation as general criterion for disease (1977). However, Engel proposes that in terms of the human experience of illness, laboratory testing may only specify disease potential and not the reality of what is occurring with the disease at that time and therefore additional factors must be accounted for (1977). These factors include one’s experiences related to their psychological, social and cultural considerations in addition to other biological factors. Thus, in response to this paradigm, a biopsychosocial model put forth by Engel demonstrates acknowledgement of these factors in addition to accounting for physiological components of disease. As such, Engel emphasized training physicians to value the psychosocial attributes in their patient’s with the same attention that they bring to the patients’ scientific data (Kabat-Zinn, 1990).

In light of this view, Holman (as cited in Engel, 1977) states that biomedical reductionism dominates the healthcare system. This doctrine rationalizes such undesirable procedures as unnecessary hospitalization, excessive surgery and over-prescribing of drugs (p. 134). Holman further asserts that “while reductionism is a powerful tool for understanding, it also creates profound misunderstanding when applied

unwisely... and is particularly harmful when it neglects the impact of nonbiological circumstances upon biologic processes” (p.134). As such, a unique challenge faces the field of medicine. Ornish suggests that more innovative approaches to health such as sanitation and immunization practices have prevented infectious diseases which were leading causes of mortality in the earlier part of the last century (1984). Chiaramonte (1997) points out that even though technology has brought forth new advances in treatment methods patients are increasingly dissatisfied with their current level of medical attention.

“The side effects and inadequacies of many drugs and procedures have been discussed at length in the lay press, and many Americans have begun to look beyond conventional medicine for health care. Not surprisingly, most people seeking out unconventional therapies are those with chronic diseases. Although the treatment of many acute and infectious diseases has improved, it has become clearer that the biomedical health care model is not equally effective for all types of stages of illness. Many physicians have noticed that patients experiencing emotional stress often complain of chronic physical symptoms that respond poorly to medications. This phenomenon has led to a growing scientific movement charged with exploring the mind’s capacity to affect the body” (Chiaramonte, as cited in Karren, Hafen, Smith, & Frandsen, 2001).

Spiegel (1993) asserts that as we continue to move ahead into the new century, we do so armed with new technologies that help us advance with treatment options. However, we do so with an antiquated conception of the interaction between the mind and body, deeming the connection between the two as purely mechanistic (1993). Spiegel contends that this view has encouraged the biomedical premise that psychological conditions are merely indications of underlying physiological circumstances with little or no significant effect upon them (1993).

In reaction to this, Engel's seminal article set forth the challenge of redefining medicine's role of healthcare by embracing a paradigm that recognizes psychological and social aspects as vital components of wellbeing and disease (Karren et al., 2001). In the years since Engel's insightful views, the organization, and delivery of healthcare in the United States have undergone dramatic changes (Gray, Brody, & Johnson, 2005).

Within the current age of reform and managed care, the primary care clinic has surfaced as the dominant context for healthcare delivery (Pruitt, Klapow, Epping-Jordan, & Dresselhaus, 1998). Health care reform has shifted medical services from specialty to primary care settings. Thus, referrals to specialty clinics are losing ground to primary care physicians and increasing pressure is on this field to manage more patients with a growing spectrum of patient health concerns (Pruitt, et al., 1998). With this escalating demand put upon primary care physicians, patient health cannot adequately be addressed solely through the biomedical framework. Although progress has been made towards physician awareness of psychosocial and behavioral contributions of health (Pruitt, et al., 1998), there is notable frustration within the medical community regarding the identification of behavioral problems that hinder implementation of behavioral health modifications (Alto, 1995). As the demands increase, so does the incidence of medical error (Institute of Medicine, 2000).

According to the Institute of Medicine (2000), during the latter part of the last century, mortality rates due to medical error averaged ninety eight thousand incidents annually. Leape (as cited in Mechanic, Rogut, Colby, & Knickman, 2005) affirms that albeit not all of these deaths can be solely attributed to increases of the pressure put upon

medicine, “conditions of work (long hours and heavy work loads), and managerial style (diffused responsibility and lack of teamwork) make it more likely that an individual will make a mistake” (p. 162). In order to assuage the burden put upon medicine, primary care physicians need additional skills to manage the behaviorally based problems they encounter most often (Pruitt et al., 1998). Common conditions encountered are chronic illnesses, somatic symptoms and health-threatening behaviors. All of these conditions indicate the need for a more comprehensive approach to care. For example, an estimated 68% of middle-age adults and 88% of elderly persons have at least one medical condition that will be chronic despite current medical interventions (Hoffman, Rice, & Sung, 1996). Chronic conditions are among the largest causes of death and disability in the U.S. (Murray, & Lopez, 1996). Furthermore, from a cost perspective, chronic conditions, somatic symptoms and health-threatening behaviors are problematic.

In 2004, it is estimated that health care costs in the U.S. exceeded 15 percent of the gross domestic product. These cost totaled more than 1.7 trillion dollars, or \$5,600 per person (National Center for Health Statistics, 2005). According to the United States Department of Health and Human Services (2006), chronic illnesses accounts for as much as 78% of total healthcare expenditures. In 2000, 45% (125 million) of the US population suffered from chronic conditions and 21% (61 million) experienced multiple chronic conditions (Anderson & Horvath, 2004). Furthermore, these rates are expected to progressively increase for the next two decades (2004). With this projection, by 2020 nearly 50% of the US population (164 million) will suffer from at least one chronic condition (2004).

The Department of Veterans Affairs (VA) manages one of the largest integrated health care systems in the United States, offering health care services to more than 3 million veterans each year (Yu, Ravelo, Wagner, Phibbs, Bhandari, Chen, & Barnett, 2003). Veterans who enroll in the VA health care system receive a uniform set of healthcare benefits which include medical, surgical and outpatient care (2003). Additionally, the VA offers comprehensive health care benefits that other health care programs such as Medicare, managed healthcare plans and other private health insurance programs may not provide. Services not provided may include special programs for substance abuse and specialized mental health, as well as long-term care, domiciliary care, rehabilitation and prescription drug benefits (2003). In 1999, Yu, et al., conducted a study that assessed the costs of chronic conditions within the VA system. Their findings revealed that among the 3 million veterans seeking health care through the VA system in 1999, 72% (nearly 2.5 million) of those individuals suffered from at least one chronic condition (2003). Total expenditures for VA health care totaled 14.3 billion dollars. Seventy two percent of the patients, with at least one common chronic illness accounted for 96% of this amount, which summed to \$13.7 billion dollars (2003). In 1999, nearly 1.2 million veterans suffered from at least three or more chronic conditions (73%), and accounted for 73% of the total health care expenditures (2003). Yu et al., found that by and large, individuals who seek health care through the VA system experience more chronic diseases than the general population (2003). However, as previously stated, general population projections are forecasted to increase.

One considerable chronic condition which currently afflicts this population is hypertension. As previously stated, hypertension is defined as a chronic elevation in blood pressure, with systolic blood pressure of 140 mm Hg or greater or diastolic blood pressure of 90 mm Hg or greater (Joint Committee on Detection, Evaluation and Treatment of High Blood Pressure [JNC VI], 1997). Blood pressure in excess in 140/90 mm Hg is further categorized in terms of hypertension severity as Stage 1 (140-159/90-99 mm Hg), Stage 2 (160-179/100-109 mm Hg), and Stage 3 (\geq 180/110 mm Hg) (1997). In the United States, over 50 million adults suffer from hypertension, and the percentage receiving treatment for this disorder is approximately 55% (Archives of Internal Medicine, 1997). Hypertension is extremely common in older Americans, illustrating that as age increases, so does its prevalence (1997). Additionally, hypertension exists with 60% prevalence for White Americans, 71% for African Americans and 61% for Latinos (American Medical Association, 1997). The percentage of hypertensive individuals with an average below 140/90 mmHg is approximately 29%, illustrating that almost three fourths of this population is not able to control their illness, even with medication therapy (Gatchel & Oordt, 2003). Particularly for older populations, systolic blood pressure is a stronger predictor of serious cardiac disorders such as coronary heart disease, heart failure and stroke than diastolic blood pressure (Gatchel, et al., 2003). Nearly 95% of all hypertension is of unknown cause, and is labeled as essential, benign, or primary. This type of hypertension is distinguished from secondary hypertension, which denotes elevation in blood pressure in relation to other disorders (2003).

In 2003, 30.2% of individuals in the general population who were at least 20 years old had a prevalence of hypertension (National Center for Health Statistics, 2005). When analyzing incremental age groups, the average percentage of hypertension prevalence increases considerably. For example, the average prevalence of hypertension among persons aged between 45 and 54 years increases to 31.4%, whereas the average increases to 64% for persons 55 and over (2005). Yu et al. found that in 1999, hypertension affected nearly 37% of the total population and was the leading chronic condition among persons seeking health care through the VA system (2003).

As the cost of health care has increased from 4 to 14 percent in the past 30 years (Schroeder, & Cantor, 1991), so has the need for cost effective interventions. If illnesses and accidents would cease to occur, our nations' health care costs would essentially disappear (Fries, Koop, Beadle, Cooper, England, Greaves, Sokolov, & Wright, 1993). Acute illnesses decrease with technological advancements in medicine. However, as these acute diseases decline the incidence of chronic illness escalates (1993). Decreasing chronic illnesses would help to lower overall medical expenses. Furthermore, lowering incidents of chronic illness would not only offset monetary expenditures, but would also increase well being. With the emergence of chronic disease as the leading risk to health status and the greatest cause of national health care costs, it is essential to underscore the importance of helping individuals learn to better manage their health through preventive methods (Epping-Jordan, 2005; Epping-Jordan, Galea, Tukuitonga, & Beaglehole, 2005; Yu, et al., 2003).

In the study of risks related to hypertension, lifestyle factors were associated with hypertension prevalence and were subject to biobehavioral interventions such as exercise, nutrition awareness and stress management (Blumenthal, Sherwood, Gullette, Georgiades & Tweedy, 2002). In addition to this, pharmacotherapy as a viable treatment option for hypertension has grown significantly in the past few decades (2002).

The most commonly prescribed medication belong to either the class of diuretics, beta-andrenergic blockers (β blockers), calcium antagonists/ channel blockers, or angiotensin-converting enzyme (ACE) inhibitors (2002). Diuretics and β blockers are utilized as a first line of defense among individuals with hypertension, however, more recently, calcium channel blockers and ACE inhibitors have also been shown to perform effectively at reducing elevated blood pressure (Hennekens, 1998). In a study comparing hypertensive pharmacotherapy with a placebo, Staessen et al., (1997) found that after a two year follow-up among the 4695 participants, systolic and diastolic blood pressures decreased by 23 mm Hg and 7 mm Hg respectively among participants who were prescribed medication (either diuretics, β blockers, or both) whereas individuals receiving placebos demonstrated decreases of only 13mm Hg in systolic readings and a 2mm Hg diastolic readings. Further evidence of medication efficacy towards hypertensive treatment is seen in a meta-analysis conducted among 14 randomized control trials, exhibiting an average of 5 to 6 mm Hg drop in diastolic blood pressure (Collins et al., 1990).

Despite the demonstrated advantages of pharmacotherapy for hypertension, successful control of blood pressure remains difficult, as evidenced by only one fourth of

Americans diagnosed with hypertension have their blood pressure managed effectively through this treatment modality (Burt, et al., 1995). This is possibly a consequence of inadequate medication adherence, which could be due to numerous conditions such as adverse side effects, expense of medication, inconsistencies of healthcare providers, and a lack of adequate comprehension of the hazards of untreated hypertension (Blumenthal et al., 2002). Strategies such as increasing social support, family member education and patient support, home blood pressure monitoring, providing ongoing education, and compliance reinforcement (Binstock & Franklin, 1988; Kirscht, Kirscht, & Rosenstock, 1981; Morisky, DeMuth, Field-Fass, Green, & Levine, 1985) more so than dissemination of educational materials (Binstock et al., 1988; Kirscht et al., 1981).

Blumenthal et al., (2002) affirm that medication adherence alone does not rule out the importance of utilizing health behavior changes as an effective means for decreasing blood pressure. In fact, some researchers suggest that behavioral interventions may lessen the necessity for pharmacotherapy for some patients (Glasgow, Engel, & D'Lugoff, 1989).

In 1997, the Joint National Committee (JNC) presented several dietary proposals towards the prevention and management of hypertension, including weight loss for individuals who are overweight, as well as reducing salt intake, and decreasing alcohol consumption. Connected to these recommendations, a study examining the effects of dietary patterns among hypertensive and non-hypertensive individuals found that persons who incorporated into their eating habits a diet rich in fruits and vegetables, and low-fat dairy foods and low in saturated fat for an eight week period were more effective in

significantly decreasing their systolic blood pressure (Appel, et al., 1997). Findings from this study showed that hypertensive individuals were able to reduce their systolic blood pressure by 11 mm Hg and diastolic blood pressure by 5 mm Hg than individuals who did not incorporate these dietary practices (1997). Based on this research, it is evident that the relative lack of side effects of nutrition management, coupled with the efficacy of this health behavior adjustment in lowering blood pressure (Blumenthal, et al., 2002), is viable as an intervention for treatment and prevention of hypertension. Furthermore, it is suggested that nutrition interventions may function as a preventive measure by lessening blood pressure in non-hypertensive individuals, as well as initial therapy in Stage 1 hypertension, as well as an adjunct to pharmacotherapy with individuals diagnosed with more remarkable types of hypertension (2002).

Weight management in combination with increased activity has also shown to significantly decrease blood pressure among hypertensive individuals. In a study comparing the combined effects of these two factors, Blumenthal et al., (2000) demonstrated that individuals within a combined weight and exercise regimen had a 7 mm Hg systolic and 5 mm Hg diastolic decrease, as opposed to the exercise-only group's 4 mm Hg decreases in both systolic and diastolic blood pressures.

In addition to physiological health behavior modifications, stress management practices such as increasing self awareness surrounding stress as well as cognitive restructuring techniques and relaxation practices that are designed to diminish stress arousal by modifying emotional and cognitive reactions to events (Blumenthal, 2002).

Findings from a meta-analysis evaluating 90 studies on stress reduction in the treatment of hypertension against 30 pharmacological and behavioral interventions demonstrated that multimodal behavioral intervention programs that included stress reduction as part of their regimen showed a significant decrease in blood pressures, more so than interventions incorporating only single-component stress reducing therapies (Linden & chambers, 1994). Moreover, this research established that treatments including stress management, exercise, and pharmacotherapy were equal in significantly decreasing systolic blood pressure levels (Linden & Chambers, 1994).

With the escalation of chronic health conditions comes the necessity to more effectively recognize the underpinning of their pervasiveness. Therefore, it is essential to re-examine associations among physical and emotional health. The concept of linking emotional and physical health began with the ancient Greeks. Their philosophy significantly influenced medical practice for millennia (Friedman, 1990). Hippocrates, the ‘father of medicine’ considered the imbalances of bodily “humors” such as phlegm and blood to directly influence physiological and mental well being (1990). Additional evidence in the causation of biological rationale for emotional states was the belief that hysteria in women was due to the displacement of the uterus. Until recent times, endeavors to find and treat physical imbalances governed medicine. These “blood letting” practices in order to achieve equilibrium have been abandoned and discredited by modern medicine, however, so has the notion of internal balance as the basis for health (1990). Friedman (1990) establishes that treatment of infectious diseases dictated the purpose of medicine for most of the twentieth century. This biomedical method

augmented the focus of medicine until health threats shifted from communicable disorders to increasing prevalence in chronic conditions (Friedman, 1990; Matarazzo, 1982). Most current leading disorders such as high blood pressure, cardiovascular disease, diabetes and obesity partially consist of an imbalance of internal physiological processes that might not be alleviated by solely taking a pill (Matarazzo, 1982). Therefore, based on this shift, Friedman suggests that within medicine there is a re-emphasis on promoting and maintaining balance (1990).

In line with this refocus on balance is the notion of internal homeostasis, which suggests that physical wellbeing results from a stable, internal environment. This internally balanced environment is based on the belief that healthy cells foster a healthy body. Karren et al. (2001) explains that normal homeostasis involves the “optimal balance of hormones, immunity, and nervous system functioning, [which] protects us from the many threats to health we encounter today” (p. 3). As previously mentioned, up until the latter part of the twentieth century, the medical community did lend significant credibility to the idea of homeostasis. The change in perception came with the presence of increasing chronic physical maladies. Thus, the course of contemporary medicine was nearly transformed had it not been for advances of “biomedical progress in internal medicine and by the hospital-based centralization of medical care” (p.7, Friedman & DiMatteo, 1989; Starr, 1982; as cited in Friedman, 1990). However, based on the transformation of prevalence in disease type, the idea of balance may affect the manner with which we view and manage health.

The previous dominating view was that there was no need to examine other factors other than biological influences if this domain could account for most of the variance in disease cause, course and treatment (Temoshok, 1990; as cited in Friedman, 1990). Since the majority of disease occurrences are multiply determined, awareness of numerous influences can bring about new and alternative interventions (Temoshok, 1990). Alternative interventions become available when the primary treatment resulting from a single cause-effect model proves ineffective, and such treatments may reinforce the efficacy of the primary intervention (1990). Alternative interventions are designed to augment recovery rather than rival against the efficacy of treatment, often enhancing treatment effects and making the difference between recovery and deterioration of one's health (1990). The traditional medical model is also compatible with multiple interventions. For example, it acknowledges drug and pathogen interactions that may impact treatment. However, this model customarily restricts itself to the biological domain.

With the emergence of a more holistic approach to healthcare, so has the necessity of collaboration between primary care and behavioral health. However, change has not come easy. In 1985, the *New England Journal of Medicine* published the findings of one study which showed negligible effects of psychosocial factors as clinical predictors of the duration of survival in newly diagnosed patients with advanced stages of breast cancer (Cassileth, Lusk, Miller, Brown, & Miller, 1985). In an editorial responding to this article, the journal's deputy chief editor stated, "I do not wish to argue that people have no responsibility for their health... however, it is time to acknowledge that our belief in

disease as a direct reflection of mental state is largely folklore.” (Angell, 1985; as cited in Freidman, 1990). Since then numerous studies have established and legitimized the biopsychosocial paradigm of health. For example, in 1992, Dutch researchers examined twenty two studies on the effects of psychological and behavioral treatment programs for cancer patients and found that these programs decreased stress, enhanced sense of control and decreased physical side effects (Trijsburg, van Knippenberg, & Rijpma, 1992).

As medicine takes more account of psychosocial variables, so does the progression of integration between primary care and behavioral health. As such, so do the demands for the domain of health psychology. Furthermore, because of changes in medicine such as managed healthcare reform, delivery of services, and changes in prevalence of disease types, a noteworthy prospect exists for psychology to increase its position to suit the existing healthcare atmosphere (Pruitt et al. 1998).

Early work utilizing mental health professionals as part of primary care teams demonstrated noteworthy monetary savings across whole health systems.(Cummings & Follette 1968; Cummings & VandenBos 1981; Cummings, Dorken, Pallank, & Henke, 1990; Cummings, Pallak et al. 1991). Evidence shows these savings have been realized in the hospital setting. (Jones and Vischi 1979; Mumford, Schlesinger et al. 1984). For example, Cummings and Follette (1968) stressed that recognizing the psychological needs of medical patients was beneficial both clinically and economically. For patients at a large health maintenance organization (HMO), they established that over 60% of all visits were made by the “worried well” with no diagnosable medical disorder. Not only did the psychological services assist with their wellbeing, but the direct costs of providing

treatment was offset by reductions in subsequent general medical use. Research on high utilizers of services and on patients with somatization disorder suggests cost offset effects (Noffsinger, 1999; Noffsinger & Scott, 2000a).

Research from the Service Linked Research Unit at McMaster's in Canada has analyzed whole system costs, within the context of high service utilization and the embedding of mental health care provisions. What they have shown is that providing integrated psychosocial interventions results in significant whole systems cost savings. (Browne et al., 1999). There have been a number of useful summaries of research in this area.(Von Korff, Katon et al. 1990; Friedman, Sobel, Myers, Caudill, & Benson, 1995; Sobel 1995; Von Korff, Katon et al. 1997).

There is considerable evidence that shows alleviating healthcare monetary costs are beneficial. In addition to this, an additional vital focus is on improving health and quality outcomes. Understanding that the demand for medical services is motivated not solely by the physical components of disease but also by psychosocial factors as well is crucial (Friedman et al., 1995). Seeking healthcare is a complex behavior that is strongly influenced by psychosocial factors such as individual attitudes, perceptions, and degrees of emotional distress (Friedman et al., 1995). How a patient behaves, has a strong impact on health. For example, how one eats, drinks, takes drugs or exercises physically effects their physical health. Unhealthy behavior such as smoking, poor diet and a sedentary lifestyle are significant contributors to morbidity. Thus, behavior modification can influence physical health. It is therefore important to recognize one's emotional health and its impact on adopting behavioral modification practices. It is also important to

maintain healthy habits and reduce relapses in negative health behaviors that will negatively affect physiological wellbeing. For example, many patients who experience emotionally stressful events can increase the probability of readopting stress relieving behaviors that have helped them cope with their anxieties in the past (Friedman et al., 1995; Ornish, Brown et al., 1990).

Psychosocial Components of Health

As well as poor behavior patterns contributing to illness, psychosocial factors have progressively been implicated in healthcare seeking (Friedman et al., 1995; Nicasso, Meyerowitz, Kerns, 2004). In a three year study examining over 1000 patient records from an internal medicine clinic, Kroenke & Mangelsdorff (1989) discovered that among the most common somatic complaints, less than 16% were identified as being organic. The researchers determined that psychosocial variables were presumably the cause of 74% of the cases with unspecified etiology (1989). Similarly, Strosahl (1998) reported that 90% of patients had no organic basis for their complaints after a 10-year follow-up. Consistent with these findings, in a twenty yearlong study at Kaiser-Permanente, found that more than 60% of all visits by medical patients at their facilities were made by individuals with no clear diagnosable disorder (Cummings & VandenBos, 1981). Tulkin and Gordon (1998) wanted to determine the most prevalent psychological conditions found in primary care settings. Patients with no evident organic etiology were diagnosed as follows; pain and somatization (25%), depression (20%), anxiety and panic (20%), job stress (10%), and marital and family problems (10%).

The considerable prevalence of psychological disorders observed in primary health care settings has led some to suggest that the principal role of primary care is to provide mental health services and that primary care is the de facto mental health system in the United States (Pinkus, Knox-Houtsinger, Bachman, Keyser, 2005). Unfortunately, the primary care system is generally not equipped to manage psychological disorders. Consequently, such problems often remain untreated. Findings from an investigation of five studies illustrate that over 50% of the time primary care physicians overlook psychiatric conditions (Higgins, 1994). To add to this, patients suffering from a panic disorder are generally seen by nine specialists prior to receiving a definitive mental health diagnosis (Strosahl 1994).

It is essential to understand the role that psychosocial circumstance plays in primary care beyond the mere perception of symptoms or compliance with treatment. As previously stated, chronic conditions make up an extraordinary percentage of health problems in our nation. More specifically, of the leading causes of death in the United States, heart disease, cancer, and cardiovascular disease are all known to be related to behavior factors such as sedentary lifestyle, poor diet and smoking (Higgins, 1994). Furthermore, these factors only exacerbate the prevalence of chronic health conditions. Thus, psychological interventions to manage behavioral risk factors are a crucial factor of prevention and often play a pivotal role in the rehabilitation process (1994).

Psychological conditions are also shown to influence blood pressure management (Jula, Salminen, & Saarijarvi, 1999; Markovitz, Jonas, & Davidson, 2001; Williams, Nieto, Sanford, & Tyroler, 2001), mortality due to heart disease (Cossette, Frasure-Smith,

& Lesperance, 2001; Donker, 2000; resistance to infection and cancer (Kiecolt-Glaser & Glaser, 1999; Miller, Dopp, Myers, Stevens, & Fahey, 1999; Takahashi et al., 2001), surgical outcomes (Schofferman, Anderson, Hines, Smith, & White, 1992), Frasure-Smith et al., 2000), and wound recovery (Kiecolt-Glaser, McGuire, Robles, & Glaser, 2002; Marucha, Kiecolt-Glaser, & Favagehi, 1998).

It is essential to point out that the presence of psychological disorders does not exclude the possibility of underlying organic conditions. However, although disease is often seen in primary care settings, data suggests that they generally appear in the form of illness, which is thought to result from distress and disease (Folkman & Lazarus, 1982; Ornish, 1984; Ornish, Brown et al., 1990).

Research shows that integration of psychological services and primary care may result in reductions in the quantity of medical visits by 30% to 40% (Strosahl, 1998) and decreases in medical costs by 20% to 40% (Chiles & Lambert, 1999; Friedman, et al., 1995; Strosahl & Sobel, 1996). In addition, it has been suggested that if a new medical procedure were supported by evidence that is as strong as the evidence for psychosocial interventions for medical patients, it would be readily accepted. However, some regard the fact that such services have not been more widely integrated in health care as an indication of unfounded biases critical of psychological approaches, which need to be reexamined (Sobel, 2000). As Malcolm Gladwell points out, change can occur serendipitously, affecting all systems to transform in order to fit new demands put upon the systems (2000). Thus, Gladwell posits that a social epidemic is generated when an intervention shift becomes common practice. This comes not with “an avalanche of new

or additional information” but rather specific information that allows individuals to understand how the intervention more appropriately suits peoples’ lives (2000).

Furthermore, physician’s lack of appreciating the psychologist’s function in the medical setting has been recognized as obstacles to the incorporation of medicine and behavioral healthcare (Nickelson, 1995; Pace, Chaney, Mullins, & Olson, 1995; Pruitt, Elliot, McGowan, Koener, & Mullins, 1988; Stabler, 1988). Pruitt, Elliot, McGowan, Koener, & Mullins, 1988; Stabler, 1988).

Since the latter part of the last century, there has been significant progress within the field of health psychology in recognizing principal concerns related to psychological and physiological illnesses, as well as chronic health conditions (Nicasso & Smith, 1995; Christensen & Antoni, 2002; Resnick & Rozensky, 1996). As a result of these developments, clinicians and researchers more readily recognize the characteristics of behavioral risk factors and chronic diseases associated with them (Smith, Orleans, & Jenkins, 2004). For example, prevalence of, as well as risk factors associated with smoking and obesity are now more readily acknowledged (Orleans, Gruman, Ulmer, Emont, & Hollendonner, 1999). There is also a growing body of knowledge surrounding additional hazards which jeopardize psychosocial wellbeing beyond traditional behavior risks such as poor diet, activity levels and smoking (Smith et al., 2004). These risk factors consist of social isolation, socio-economic status, personality traits and negative emotions (Adler & Matthews, 1994) as well as psychophysiological outcomes of stress and emotion as the general means governing their link with illness (Smith et al., 2004).

Furthermore, health psychology has been efficacious in adapting psychological treatments for use in traditional medicine (Christensen et al., 2002; Lorig & Holman, 1993; Nicasso, Meyerowitz, & Kerns, 2004). Health psychology has urged clinicians to develop interventions intended for improving one's knowledge base concerning social support, behavioral change, stress reduction and self regulation (Nicasso et al., 2004). Examples of some successful interventions include cognitive-behavior therapy for chronic pain related to arthritis, (Keefe et al., 1990), and behavior therapy for tension headaches and other chronic physical ailments such as low back pain and discomfort associated with sickle cell anemia (Blanchard, Andrasik, Ashles, Teders, & O'Keefe, 1980; Gil et al., 1996; Wells, Golding, & Burnham, 1989).

Much attention towards intervention development has been devoted to increasing the efficacy of managed care organizations. Namely, programs have focused on creating brief and economical treatments that employ creative and resourceful methods (Mohr, Likoski, Bertagnolli, Goodkin, Van Der Wende, Dwyer, & Dick, 2001).

Until recently, the prevailing views of health behavior and prevention models were limited to risk of disease and its development. Recognizing the stages of disease risk, from onset of illness through maintenance within healthy individuals, to the development of chronic conditions remains important. However, researchers argue that clinicians must consider additional factors when promoting health prevention (Smith et al., 2004). The primary aspects of health behavior are targets and strategies for intervention. Smith et al posit in addition to these factors, one must include individual psychological processes such as perceptions of and reactions to stress, coping mechanisms, locus of control, sense of feeling

supported through their environment (e.g., social support) and vulnerability to recurrence of disease (2004).

The major sources of death and illness in childhood are unique to those jeopardizing adolescent health. Moreover, the illnesses afflicting these two age groups are markedly different from health threats in middle and later adulthood. Current findings indicate that the frequency of illness expands in proportion to increases in age (National Center for Health Statistics, 2005). This is especially evident for chronic conditions such as diabetes and hypertension (2005). Therefore, it is essential that preventive healthcare clinicians and researchers take into account the changing nature of threats to health, the related behavioral risks, their determinants, and the effects of interventions across the life span (Siegler, Bastian, Steffens, Bosworth, & Costa, 2002; Williams, Holmbeck, Greenley, 2002).

In addition to recognizing individual psychological factors researchers stress that preventive medicine should adopt a comprehensive approach that encompasses an integrative cross-disciplinary perspective (Smith et al., 2004; Abrams, 1999; Suls & Rothman, 2004). Backgrounds and experiences representative of different fields will improve the development of valuable information and collective involvement (Smith et al., 2004), thus working towards treating the individual in a more holistic manner as put forward by Engel's (1977) biopsychosocial perspective. By working synergistically, teams can develop more successful health promoting preventive programs that utilize the biopsychosocial approach, which in turn enhance health outcomes (Nicasso et al., 2004).

Researchers have used various models to help understand and explain health behaviors. The view on illness and health incorporates the idea that individuals are healthy until a tangible external stimulus invades the body. This leads to the disruption

of normal functioning. People generally believe that individuals are motivated to return to good health. This has been the prevailing view on health and illness; however, researchers have recently examined the psychological, social and cultural factors that predict health behaviors and practice of health-compromising behaviors and the non-practice of health enhancing behaviors. For example, it is estimated that 25 % of all cancer deaths and approximately 350,000 premature deaths from heart attack could be avoided each year by eliminating one risk factor (Centers for Disease Control, 2006). A 10% reduction in weight through dietary changes and exercise in men is estimated to produce a 20% decrease in coronary artery disease as well as lower the prevalence of degenerative arthritis, gastrointestinal cancer, diabetes, strokes, and heart attacks (Taylor & Aspinwall, 1996).

The health psychology literature has consistently found several psychosocial factors associated with differential health outcomes for individuals. Some of these factors include one's perceptions of emotional stress, coping mechanisms in managing one's stress, and locus of control. Locus of control is the general expectancy which is distinguished by either internal versus external control orientation. Individuals who identify as possessing an internal locus of control are those who believe that events are a consequence of their own actions. In contrast, individuals who possess an external locus of control believe that events are a function of factors unrelated to their own actions. The following section reviews the literature on stress, coping, locus of control and their impact upon health outcomes.

Factors of Consideration for Health Outcomes

It is essential to consider other variables, which may predict improved health outcomes. Essential factors found to predict better health outcomes have included stress and coping styles. Stress and coping have been shown to play a significant role in health self-management. Extreme stressors, trauma, grief, or major illnesses can cause grievous harm and lead people to experience profound mental and physical dysfunction. Selye, among others proposed that stress is significantly associated with disease (Levy, 1985; Selye, 1976; Weiss, 1971; as cited in Friedman, 1990; Spiegel, 1993; Ornish, 1984), identifying numerous studies that show its impact upon physiological outcomes. Assessing perceptions of stress upon prevalence of disease, researchers found a significant frequency of peptic ulcer disease and development of ulcers among individuals who perceived themselves as stressed in comparison to individuals who did not perceive themselves as stressed (Anda, Williamson, Escobedo, Remington, Mast, Madans, 1992; as cited in Karren et al., 2001).

Benson (1975) identifies stress as environmental conditions that require behavioral adjustment, including circumstances associated with rapid cultural socio-economic change or uncertainty in one's immediate environment. In line with Benson, Lazarus describes stress as a condition or feeling experienced when a person perceives that demands exceed the personal and social resources the individual is able to mobilize (1990). Others view stress as the body's attempt to restore balance when faced with physical difficulties such as illness or psychosocial events that tax one's well-being, thus forcing oneself to rethink and reason in new ways (Sapolsky, 1998). From an

environmental standpoint, stress consists of responses to environmental experiences associated with substantial adaptive demands. The psychological principle of stress looks toward one's subjective assessments of their capacities to deal with the strain posed by certain incidents and their emotional reaction to that assessment (Sapolsky, 1998).

Current stress theory includes three primary concepts: stressors, mediators, and manifestations. Stressors are stimuli, events or experiences that potentially bring about change whereas mediators are coping resources and strategies that may help modify the stressful event. Coping resources are psychological and physical facilities whereas coping strategies are cognitive, affective, and behavioral processes that individuals utilize to handle a stressful event or situation. Lazarus & Folkman (1984) and Pearlin & Schooler (1978) describe stress outcomes as responses to potentially stressful events.

Researchers have altered their views of stress and coping and have come to recognize the relationship between stress and various negative outcomes, including physical and psychological symptoms (Folkman, Lazarus, Dunkel-Schetter, DeLongis, & Gruen, 1986). Previously, the narrow perspective of stress comprised an accumulation of various difficult life events that quantified one's level of stress. Dohrenwend & Dohrenwend (1974) emphasize that previous stress research traditionally assessed the number of major life changes and events in the life of a person. Additionally, Saplosky (1998) puts forth that prior stress models focused on past events which assumed past major life changes required adaptation struggles that impact current distress. However, contemporary models of stress underline the significance of subjective appraisals of events in determining whether or not demands will be experienced as stressors (Matheny,

Aycock, Pugh, Curlette, & Canella, 1986). Moreover, Folkman et al., (1986) posit that it is essential to consider context and one's perception of events on coping with stressful situations.

Additionally, prior researchers believed that individuals dealt with stress based on trait-based attributes. It was believed that individual traits that one possessed took precedence over differences in the stressful situation, the latter being regarded as insignificant in how one reacted. (Gaines, Smith, & Skolnick, 1977). To counter this, Lazarus (1990) espouses the view that stress is a response to current life events. To add to this perspective, Kanner, Coyne, Schaefer & Lazarus (1981) later proposed an alternative theoretical method of stress assessment that focused on micro stressors. Kanner and colleagues defined micro stressors as everyday minor or chronic demands that tend to accrue and generate stress in individuals. Numerous studies supported their evidence, finding that daily aggravation as opposed to major life events were more strongly related to physical and psychological health in adults (DeLongis, Coyne, Dakof, Folkman, & Lazarus, 1982; Chamberlain & Zika, 1990; Gruen, Folkman, & Lazarus, 1988; Lu, 1991). DeLongis, Folkman, and Lazarus (1988) investigated the relationship between daily stress and the occurrence of both concurrent and subsequent health problems, and found that persons with low psychosocial resources are more vulnerable to illness and mood disturbance when stress levels are high, even if they have very little stress in their lives. Given the numerous disorders that are affected by stress, the existence of a relationship between psychological stress and physical health has gained considerable support in recent years. Dougall and Baum (2001) point out that stress may

influence disease at any stage during its progression, from diagnosis and development to treatment and recovery. For example, Krantz and McCeney (2002) point to stress as a factor in immunologic, endocrine, and hemodynamic processes contributing to hypertension and coronary artery disease. In addition, research has indicated links between stress and: breast cancer survival (Spiegel, Bloom, Kramer & Gotheil, 1989), upper respiratory infections (Cohen, Tyrrell, & Smith, 1991), chronic obstructive pulmonary disease (James, 1993), low birth weight and infant mortality (James, 1993), depression (Kendler, Kessler, Walters, MacLean, Neale & Eaves, 1995) and autoimmune disorders (Affleck, Urrows, Tennen, Higgins, Pav, & Aloisi, 1997; Zautra, Hoffman, Matt, et al., 1998). These effects are ostensibly due to biological changes that occur during or after stressful encounters and changes in health impairing behaviors (e.g., poor dietary choices) and health protective behaviors. Behaviors which offer quick relief to stressful events such as poor dietary practices, excessive alcohol intake or smoking may increase and healthy habits such as exercise and relaxation may decrease (Smith & Baum, 2003).

Other current views of stress (Lazarus and Folkman, 1984) describe that when encountering a potentially harmful event, a reflexive, cognitive balancing act occurs in which the perceived demands of the event contrast with the individual's perceived abilities to handle it. In other words, the perceptions of stress are vital for understanding how one may or may not develop responses to it. For example, even in cases of severe stress, individuals who encounter hardship show considerable variability in response and many recover from them readily. Whether or not an event is stressful will be determined

by the perceived demands of the event weighed against one's perceived capabilities, and an array of stress-produced emotions and physiological reactions may result from circumstances in which an individual's estimated demands exceed his or her resources. Research assessing post-traumatic stress disorder (PTSD) suggests that fewer than half of those who undergo traumatic stressors experience PTSD, and numerous examples of individuals returning from adversity exist (Frankl, 1963; Folkman, 1997; Janoff-Bulman & Berg, 1998).

Lazarus & Folkman (1984) present two types of cognitive appraisals that include a primary appraisal consisting of a particular event posing a threat to the individual, and a secondary appraisal comprised of one's perceived capacity for handling the potential stressor. Lazarus, Kanner, & Folkman (1980) posit that primary appraisal of an event may lead to three potential opportunities: the event may be considered irrelevant and thus disregarded; it may be perceived as a non-threatening situation that may or may not benefit the individual; or the incident may be perceived as stressful. This potentially stressful event may suggest a harm-loss, threat or a challenge to the individual. According to Lazarus et al (1980), 'harm-loss' indicates previously occurred injuries whereas threats indicate anticipated dangers from the stressor and challenges signify a circumstances where one may perceive an opportunity for learning and growth. The secondary appraisal may hold more significance than the event itself due to one determining the importance of the encounter through the appraisal (Lazarus et al., 1980).

Events perceived as potentially threatening may produce a stress response that includes physiological and psychological changes that occur reflexively whenever coping

resources are taxed. Perceptions of harmful incidents induce this response and while a hyper-vigilant nervous system was extremely adaptive to our ancestors who faced constant environmental threats, modern stressors are mainly psychosocial (Sapolsky, 1994; Matheny et al., 1986). As such, these perceptions are capable of surviving for extended periods of time, and therefore may develop into maladaptive psychological and physical disorders (Sapolsky, 1994).

A coping response occurs when one perceives that demands of an event are greater than their resources. Coping denotes the behavioral and cognitive effort utilized to handle experiences considered exceeding one's resources (Folkman, et al., 1986). Coping may happen through the regulation of distressing emotions (emotion focused coping) or by altering the difficult relationship with the environment (problem or solution focused coping). Alternatively, these coping strategies may be categorized as maladaptive and adaptive coping. As stated earlier, coping resources are psychological and physical assets whereas coping strategies are cognitive, affective, and behavioral processes that one employs in order to handle a stressful event or situation (Lazarus & Folkman 1984). Furthermore, Matheny et al., (1986) purport that coping resources are evaluated during the secondary appraisal of a potentially stressful event. Thus, if the requirements of an event are perceived to surpass one's resources, one must therefore engage emotion focused/maladaptive or solution focused/adaptive coping strategies.

The likelihood that interpersonal interactions influence physical health and stress buffering has been studied more determinedly only since the latter part of the last century (Baum & Smith, 2003). Animal research identifies some indication that elevated levels

of stress associated with interference of relationships may intensify risk of disease (Kaplan & Manuck, 1999; Sachser, Duerschlag, & Hirzel, 1998). Studies conducted on individuals indicate that the presence of positive social support is linked with reduced cardiovascular reactivity to psychological stress (Glynn, Christenfeld, & Gerin, 1999; Kamarck, Manuck, & Jennings, 1991; Uchino & Garvey, 1997), and quicker cardiovascular recovery from stress (Roy, Steptoe, & Kirschbaum, 1998). Data further indicates that that social support may lessen the effects of stress in everyday settings. Steptoe (2000) showed that physiological markers of stress as measured by blood pressure and heart rate were significantly lower among individuals who reported higher levels of social support than those who reported less amounts of social support.

Empirical findings suggest that social support benefits are not universal among persons experiencing stress (Smith et al., 2003). Although social support often safeguards against stress, Smith et al., (2003) suggest that “it may contribute to maladaptive perceptions ...under some circumstances” (p. 438). Illustrating this idea, Smith et al., (2003) suggest that advice offered from loved ones may increase distress in parents whose children suffer from cancer. Given the fact that this research suggest that types of social support are important in understanding the impact upon health, there is still strong evidence that demonstrates its bearing on psychological and physiological effects in persons diagnosed with illness (Cruess et al, 2000; Spiegel, Bloom, & Yalom, 1981). Evidence suggests that social support in the form of group therapy is beneficial to individuals suffering form illness. Research indicates that individuals who participate in group therapy may experience beneficial psychological outcomes (Spiegel et al, 1981;

Classen et al, 2001; Goodwin et al, 2001). An example of this is seen in Spiegel's work with women suffering from breast cancer. Patients in the experimental group participated in a group therapy intervention that included fostering of mutual support, coping with their illness, enhancing social and family support, and controlling physical pain. Participants in this group scored significantly higher than individuals assigned to a control group among variables of sense of social and family support (Spiegel, 1993). Assessment of mood states including anxiety and depression among both groups showed the control cohort scoring significantly worse than the intervention group (Spiegel et al., 1981). Additionally, results indicate that patients in the experimental group had fifty percent less pain sensation and suffering related to their illness than patients in the control group (Spiegel, 1993; Spiegel et al., 1983). In this study, the survival rate was significantly different between both groups (Spiegel, Bloom, & Kraemer, 1989; Spiegel, 1993). The mean survival rate from the time participants began the study until death was 18.9 months for the control group, whereas average survival time for the intervention sample was 36.6 months (1993).

Further support of possible psychosocial benefits on health outcomes among disease stricken individuals is seen in research conducted by Richardson et al., (1990) among patients suffering from leukemia and lymphomas. Patients in the three experimental groups received educational in-home supportive care whereas the control group participants received standard care. Richardson et al., indicate that the control group had significantly shorter rates of survival time than those individuals within the intervention groups ((1990). In addition, Richardson et al., report that there were

significant differences between the groups regarding compliance of medical treatment, with participants in the experimental groups showing significantly stronger compliance with treatment than the control sample (1990).

However, one important determinant of health outcomes is one's willingness to adopt new behaviors. Within the therapeutic environment, a client may or may not be ready to implement changes to the behavior that initially brought them to seek counseling. As a consequence, an individual may lie among various points along the continuum of making changes to their behaviors. Understanding and evaluating the process of change for problematic behaviors has been the central focus of the transtheoretical framework proposed by Prochaska & DiClemente (Prochaska, DiClemente, & Norcross, 1992). Initially developed to assess client motivation among research for smoking cessation programs, the model presented by Prochaska et al. titled the transtheoretical model has advanced into a multi-stage comprehensive explanation of client change (Archer & McCarthy, 2007). It is anticipated that individuals encountering problems such as smoking or substance abuse will encounter the various stages specified within this model, including precontemplation, contemplation, preparation, action, maintenance and termination en route to modification of their behavior.

Prochaska et al (2002) put forth that at each stage of change, different processes of change optimally produce progress, and each stage represents a time period as well as a set of tasks needed for advancement towards the subsequent stage. Within this model, each stage represents a period of time as well as a set of tasks needed for movement to

the next stage. Tasks to be accomplished within each stage are constant, however the time period within each stage varies (2002).

Precontemplation is a stage characterized by lack of intent to modify behaviors. Individuals within this phase are unaware of their conditions. Important others are however aware of an individuals' need to implement changes to their behavior. Prochaska and Norcross (2001) suggest that there are numerous methods to capture one's intent to change their behaviors, such as asking whether they intend to change within a period of six months. If not, then the authors posit that the individual is situated within the precontemplative stage.

Individuals existing within the contemplative stage are characterized as being aware that problematic behavior exists and are earnestly thinking about changing this behavior, however they have not committed to act accordingly. Furthermore, if one seriously contemplates on modifying their behavior within the next six months, then Prochaska et al consider them to exist within the contemplative stage (2001). However, the authors propose that it is not uncommon for individuals to remain fixed within this stage for longer periods (2001).

Preparation is a stage characterized by both intention and behavioral criteria in that persons within this period propose to adopt new behaviors within a month and have previously been unsuccessful at implementing these changes within the past year. Prochaska et al (2001) describe this stage as being one in which small strides are accomplished rather than global modifications to behavior. Although not abstaining completely from their old behavior patterns, their move towards making effective

changes is stronger than the previous stage, and further action towards modifications is expected to take place within the near future (2001).

Individuals within the action stage cease negative behaviors or acquire new behaviors within a six month time period. Within this stage, these overt behavior alterations require considerable energy and commitment of time. As a consequence, an individual within this phase amends their environment and experiences to support this adjustment (DiClemente et al., 1991; Biener & Abrams, 1991).

Subsequent to the action stage, individuals work towards preventing relapse of prior negative behavior as well as securing gains set forth by healthy behaviors within the maintenance stage (Prochaska et al., 1994). It is further proposed that an individual within this stage remain free of prior harmful behavior and consistently engage in new behaviors that oppose the previous actions for more than six months (Prochaska et al 2001).

Prochaska et al initially presented six stages of change within the transtheoretical model. Depending on the modification of behavior being evaluated, some researchers have chosen to utilize a sixth stage of change from this model titled termination whereas others have not. This stage represents a period in which individuals have completed the change process and do not need to work towards preventing a relapse of negative behaviors (Prochaska et al., 1994; Prochaska & Norcross, 2001). Furthermore, this stage is identified as an individual having complete self efficacy across all domains of at unhealthy behavior and absolutely no risk of relapsing (2001).

As evidenced, the stages of change paradigm put forth by this model exhibits rigid constructs in which an individual must exhibit in order to be labeled within certain stages (DiClemente et al., 1991). For example, for someone to fall into the preparation stage, it is expected that they intend to take action in the following month and have unsuccessfully taken action in the past year (Prochaska & Norcross, 2001). Moreover, within the therapy, as the process of behavior change progresses so does the therapeutic relationship (2001), taking on various characteristics depending on the stage a person is in. In a meta-analysis examining the processes of change across various health concerns, progression of behavior change was strongly associated with the utilization of therapeutic relationships (Rosen, 2000).

In the healthcare environment, progress towards adjustment of behaviors may adopt similar characteristics, and similar to a traditional therapeutic relationship, the therapist may take on different roles towards the client depending on the stage of the person. Within this setting, many patients are referred to a primary care psychologist for assistance with changing health behaviors. Common targets such as smoking, exercise, diet, substance abuse and medication adherence are viable factors for the stages of change based on the transtheoretical model. These stages of change assist in conceptualizing an individual's willingness cease negative behaviors as well as to acquire new health behavior changes (Gatchel & Oordt, 2003). Furthermore, primary care psychologists can be useful in helping patients discover their motivation to make necessary changes as well as assist physicians in functioning as a resource for implementing valuable behavior change plans (2003).

Modes of Preventive Health

In line with the push towards integrated healthcare, significant expansion has been made towards health promotion (Breslow, 1999; National Center for Health Statistics, 1999). In 1991, the surgeon general proposed applications for improving healthcare in the U.S. These initiatives included decreasing health disparities, increasing life span, and increasing health practices for all individuals in the U.S. (USDHS, 1991). Guidelines were set up to offer recommendations for health promotion targeted at areas such as physical activity, smoking cessation, nutrition, environmental health and safety, disease prevention, and mental healthcare (Smith et al., 2003). These recommendations encouraged medicine to focus energy on health promotion and maintenance. Thus, Americans were encouraged to adhere to these guidelines in order to change negative health practices and enhance positive behaviors. This push towards health promotion and maintenance is supported by numerous studies that suggest benefits. For example, due to the surgeon general's recommendations, physical exercise has been a focus of health promotion campaigns, and evidence ties physical activity to health related outcomes including effects on the immune system (Gleeson, 2000; Peteson & Hoffman-Goertz, 2000), decreased cancer risk (Cottreau, Ness, & Kriska, 2000; Shepard & Shek, 1998, Spiegel, Bloom, & Yalom, 1981), weight loss (Zelasko, 1995), diabetes (Wallberg-Henrikson, 1992; Kavanaugh, 1993), HIV disease (Mustafa, Sy, Macera, 1999), and cardiovascular health (Ornish, 1984).

Empirical findings indicate that exercise is an effective intervention for acute stress, showing that exercise significantly reduces psychological, hemodynamic, and

neuroendocrine reactivity among athletes as well as in healthy and hypertensive individuals (Probst, Bulbulian, & Knapp, 1997; Rejeski, Gregg, Thompson, & Berry, 1991; West, Brownley, & Light, 1998). Other research has suggested that exercise is related to lower heart rate and blood pressure reactivity (Anshel, 1996; Holmes & McGilley, 1987; Ornish, 1984). Furthermore, long term exercise has been shown to reduce anxiety and stress as well as improve coping in individuals encountering emotional stress (Smith et al., 2003).

Results from this research suggest that healthy nutrition practices can significantly impact prevalence of chronic obesity. Obesity is defined as having a body mass index (BMI) of 30 or higher. Recent statistics from the National Health and Nutrition Examination Survey for 1999-2000 indicate that an estimated 30 percent of American adults aged 20 years and older (nearly 60 million individuals) are obese. Furthermore, an estimated 65 percent of American adults are either overweight or obese, described as having a BMI of 25 or greater (USDHHS, 2005; Sacks et al., 2001).

In line with the surgeon general's prescriptions, research indicates that focusing on mental health has a beneficial effect on enhancing positive health behaviors. For example, Mayne (2001) suggests that one's emotional condition influences the integration of cognition, behavior, and physiological arousal. Research has shown that emotional states affect neuroendocrine responses (Cacioppo, Klein, Berntson, & Hatfield, 1993), and the immune system (Booth & Pennebaker, 2000). Therefore, it is plausible that positive emotional wellbeing may impact physical health by implementing beneficial activities into daily routine. Similarly, there is considerable research investigating the

effects of social support on physical and emotional health. Social support has been shown to influence strategies that improve adherence to exercise regimens in weight loss studies (Wing & Jeffrey, 1999; Jeffrey, Wing, Thorson, & Burton, 1998). Smith & Baum (2003) indicate that one possible benefit of social support is that it enhances rewarding social encounters. Furthermore, the authors point out that increased social contact helps individuals who encounter stress to experience feelings of restoration and resilience (2003). Data suggests that social support is associated with decreased risk of mortality (Berkman & Syme, 1979) psychological and physiological functioning among individuals suffering from cancer (Hegelson & Cohen, 1996), HIV disease (Lutgendorf, Antoni, & Ironson, 1998), and cardiovascular risk and disease (Ford, Alhuwalia, & Galuska, 2000; Kaplan, Salonen, Cohen, Brand, Syme, & Puska, 1988).

In response to mandates for prevention, numerous programs have come about. For example, the World Health Organization (WHO) developed the Innovative Care for Chronic Conditions Framework (ICCCF) which provides a comprehensive model for the design of health care programs based on available resources and demands. This model involves addressing the needs of the patient population by raising improved outcomes for chronic healthcare conditions. This is prescribed through increasing awareness of chronic conditions within communities as well as increasing access to available resources (Von Korff, Glasgow, Sharpe, 2002). Furthermore, the model recommends that healthcare organizations present paradigms that encourage self management among individuals stricken with chronic diseases and consistent follow-up by healthcare staff (2002).

According to the ICCCF Framework, the greatest positive healthcare outcomes arise when a partnership is created between patients, healthcare teams, and community members. The ICCCF emphasizes that successful partnerships function at their best when every member is well-informed and encouraged to manage and prevent chronic disease by communicating and collaborating with each other (Epping –Jordan, 2005). This is markedly different from traditional approaches to manage disease in that with the latter method, healthcare providers viewed as the final authority in healthcare management, with patients perceived as passive beneficiaries of their own health (2005).

Various models aimed at preventive healthcare incorporate elements prescribed by the ICCCF. Demonstrating this is a program designed to increase positive health behaviors among diabetes patients through techniques aimed at facilitating self-care through empowerment. Anderson, Funnell, Carlson, Sahel-Statim, Cradock & Skinner (2000) describe how a team of Diabetes researchers at the Michigan Diabetes Research Training Center (MDRTC) suggested that patient empowerment would help achieve healthcare outcomes by promoting self-management. The researchers believed that the patients themselves, not the educators nor the clinicians (2000) should make choices about managing their diabetes such as physical activity, dietary intake, and stress management. In doing so, the patients are in control of their self management. Thus, by helping to convey that the responsibility relies solely on the patient; facilitators empower them to recognize that choices made affect their diabetic care (2000). Furthermore, the facilitators help patients understand that the consequences of their choices affect their health (2000). It is important to note that the paradigm of empowerment is borne out of

the discipline of counseling psychology (Combs, Avila, & Purkey, 1978) in that the objective is to enable individuals to gain more power over their lives as well as increase the amount of options available to them and enhance their wellbeing (Combs et al., 1978; Anderson et al., 2000). Empowerment stresses the importance of viewing an individual holistically, as put forth by the biopsychosocial perspective, rather than the reductionist biomedical viewpoint (Anderson et al., 2000; Engel, 1977). Anderson et al., (2000) posit that the empowerment approach strives to build knowledge for individuals to become well-informed in order to make objective decisions regarding their behavioral choices (2000). In addition, the researchers propose that helping to promote patient self-awareness of belief systems, personal needs, and aspirations concerning diabetes care (2000) helps individuals to examine various emotional elements of their lives as they relate to the decisions regarding their own healthcare requirements (2000). These elements may include how stress and coping mechanisms influence their ability to effectively manage their health needs (2000). Maximizing self-management knowledge and self awareness of psychosocial factors would help populations with chronic conditions to increase sense of personal control over their illness and thus improve their health behaviors (2000).

An additional program embodying the tenets set forth by the ICCCF is the Health Promoting Model (HPM), put forward in the 1980's a guide for integrating nursing and behavioral science perspectives on causes influencing health behaviors (Pender, Murdaugh and Parsons, 2002). The HPM aims to demonstrate the multidimensional nature of persons interacting with their environment as they engage in health promoting

behaviors. This model stems from Social Cognitive Theory and Expectancy-Value. The Social Cognitive Theory subscribes to the cognitive appraisal of an action (Bandura, 1977). In Social Cognitive Theory, the individual, their behavior and environment are mutual determinants of each other such that their behavior is not solely directed by internal or external forces but by the interaction of all three components (Bandura, 1977). This is similar to the Expectancy Value Theory, which also aligns with the cognitive appraisal of an action. The Expectancy Value Theory states that engaging in an action will take place if the outcome has a positive personal value and if one believes that pursuing the course of action will lead to a desired outcome (Pintrich & Schunk, 2002). The decision to pursue a course of action entails a subjective weighing of the benefits of the action.

Another program illustrating the WHO recommendations is the Chronic Disease Self-Management Program (CDSMP). This program was utilized to promote behavior change among individuals suffering from various chronic health conditions such as heart disease, lung disease, and arthritis (Lorig et al., 1999). Topics covered in this program included exercise and nutrition maintenance, fatigue and sleep management, use of available helpful resources, medication compliance, communication with healthcare professionals and stress management (1999). The program was comprised of focus groups aimed at fostering an environment where the patients could discuss their conditions with one another, share their feelings related to their health status, talk about the effects their chronic illnesses had on their lives, as well as describe how they coped with the problems caused by their diseases (1999). In addition, the sessions focused on

helping each other create solutions to their dilemmas, both on an individual and group level (1999). Instead of advising specific changes to health behaviors in order to accomplish self-selected goals, the group leaders functioned more as discussion facilitators (1999).

Aligning with the patient empowerment perspective are principles rooted in and set forth by counseling psychology. This discipline focuses on strengths assets, and health; emphasizing coping, adjustment, as well as stress and dysfunction that individuals may encounter, furthermore promoting individuals' wellbeing and increased ability to lead more effective lives (Combs et al., 1978; Sharf, 2000). Not unlike the goals of counseling psychology, the objective of patient empowerment is to view individuals as striving for wellbeing (Combs et al., 1978; Brown, 1996). Similar to counseling psychology, the patient empowerment perspective believes that human beings have the capacity to become responsible individuals who learn, change and make informed decisions regarding their lives (Combs et al., 1978, Anderson et al., 2000). Further reminiscent of counseling psychology, the patient empowerment perspective puts forth that learning is an internal process in which the learner changes their understanding and ways of coping with their situation (Anderson et al., 2000). Lastly, patient empowerment suggests that optimal learning occurs when there is active participation in the process by exploration, experimentation and reflection (2000). Thus, with regards to empowerment through patient education, it is suggested that group meetings may take into account the ideology set forth by counseling psychology and primary care (2000).

Researchers have pointed out the powerful human need to belong (Adler, 1927; Berne, 1964; Maslow, 1962). Bandura (1977) posits that most social learning occurs through one's observation and imitation of the behavior of others. Yalom (1995) suggests that social learning through interaction with others may be addressed in a group setting.

A group therapy dynamic allows individuals to collaborate and share their subjective experiences with others (Yalom, 1995). It has been suggested that the group format provides members the unique prospect for self-awareness by encouraging members to evaluate their behaviors and thoughts in the presence of others (Ormont, 1992; Greely, Garcia, Kessler, & Gilchrest, 1992; as cited in McCarthy, Mejia & Liu, 2000). Within this environment, members may identify with each other and experience a mitigating effect of possible feelings of isolation (1995) that may occur due to their chronic health dilemmas. Yalom (1995) observes various limitations of individual therapy sessions. He argues that there are certain advantageous aspects exclusive to the group dynamic not found among individual therapy. Feelings of commonality or universality such as knowing that others have similar problems, and modeling: observing others model successful outcomes and practice new behaviors from therapy are some traits unique to group interventions (Yalom, 1995; Corey, 2000). Furthermore, the opportunity for vicarious learning by listening and observing others and the sense of belonging and support that can result from interaction with other group members are additional attributes (Corey, 2000). Some examples of groups where a sense of belonging has proven effective are with persons encountering various psychosocial

conditions such as individuals suffering from addiction (Corey, 2002), chronic health conditions such as cardiovascular problems (Kirschner, Cody, Thrush, Sullivan, & Rapp, 2003; Williams, Barefoot, & Schneiderman, 2006), and diabetes (Lorig et al., 1999), as well as veterans encountering difficulties such as PTSD or depression (Armstrong & Rose, 1997).

In addition to the advantages unique to group intervention, another beneficial element is the educational component. Psychoeducational groups were initially aimed at encouraging participants in educational settings to cultivate personal growth and awareness through increased knowledge (McCarthy, et al). Moreover, due to emphasizing didactic information, psychoeducational groups work well with cognitive approaches (Vander Kolk, 1985; as cited in McCarthy et al., 2000). Specifically, cognitive approaches within a group intervention may help uncover irrational beliefs or distorted thinking (Ellis, 1992; Beck & Weishaar, 1989; as cited in McCarthy, et al., 2000), which may stimulate physiological responses. These physiological responses may intensify feelings of stress, a factor strongly implicated in cardiovascular conditions such as high blood pressure or hypertension. By educating participants about the influence of maladaptive thinking upon stress, participants may begin to acknowledge links between thoughts and emotions. It is posited that positive health outcomes will develop from this enhanced awareness.

Based on the previously mentioned models, the group format that has been most employed within the healthcare environment is the psychoeducational group. In this approach, group leaders act as both information providers and facilitators of discussion

(Jacobs, Masson, & Harvill, 2002). As a result of the current financial burden plaguing the healthcare environment, managed healthcare organizations have mandated efficiency coupled with high outcome (Mechanic et al., 2005; Pruitt et al., 1998; Schroeder, 1991).

Group visits are the most recent addition to a burgeoning group of practices utilized to enhance efficiency and quality of care. This class of medical appointment is one example of a format ideally suited to providing care to people with chronic problems. According to Dr. Edward Noffsinger, the principal benefit of this approach is improved patient care (2000). However, Noffsinger suggests that providing this type of model would appeal to many practices in that group visits may relieve difficulties that patients may experience with access to healthcare as well as reduce amount of healthcare costs (2000). Noffsinger proposed that group medical appointments would ultimately reduce healthcare costs through patients' eventual reduction in the amount of unscheduled doctor visits and reductions in hospital admissions (2000). It was proposed that reductions in doctor hospital visits would result from increase in patient self care through the knowledge and experience gained by group participation. . Besides receiving increased access to comprehensive medical care, Noffsinger & Scott posit that the key advantages to this type of visit is the mutual support, and an improved sense of self efficacy for each patient (2000). For example, behavior modification can be taught to groups, group members can learn from one another, and individual struggles with chronic health problems can be validated and supported by the group.

Group visits were designed to put patients first by providing them with prompt access to healthcare, additional time with their healthcare provider, and a more relaxed

pace of care in which both mind and body topics are addressed. In addition group visits offer the assistance and social support from others tackling similar health concerns (2000). Noffsinger & Scott (2000) proposed that there are certain characteristics that group visits should possess. Initially, group medical appointments are clinical visits in which medical care is delivered analogous to an individual medical appointment. One-on-one appointments were designed when the need for acute care dominated the field of medicine; however, in the current atmosphere of increased chronic conditions, a more suitable approach to managing health is through patient education and collaboration between disciplines (Freidman et al., 1995; Nicasso et al., 1995; Noffsinger & Scott, 2000a). Furthermore, didactic information presented to participants in the group setting is a further benefit designed to assist them in increasing their knowledge regarding behavioral change through enhancement of self care and patient empowerment (Noffsinger & Scott, 2000). Finally, Noffsinger & Scott (2000a) assert that group visits should not function as lectures, instead, they should operate as interactive sessions between patients and providers so that information is shared equally, thus fostering an environment in which all participants learn from each other. The interactive nature acts to validate participants in the eyes of their peers, thus helping them to understand that they can become valuable resources in coping with their health conditions (2000). Noffsinger & Scott (2000a) suggest that similar to healthcare practitioners, patients take pleasure in helping others and propose that “patients have more ‘hands-on’ experience in coping with illness...than the caregivers do (thus) it is important to validate the patients’ role of being their own caregivers” (p.34).

Three types of group visit models are the Cooperative Healthcare Clinic (CHCC), the specialty CHCC and the Doctor Interactive Group Medical Appointment (DIGMA). The CHCC was designed by Scott in 1990 as a reaction to frustration towards not having enough time with his patients to provide adequate care (Scott & Robertson, 1996). Scott reports experiencing the need for a system that addressed patient care in a more efficient manner, however, at the time, no format existed that would deal with this issue. Dr. Scott's patient population consisted of elderly individuals who suffered from chronic conditions such as diabetes, hypertension as well as psychosocial issues associated with aging. Understanding that the 15 to 20 minutes he spent with his patients was not adequate time to address all of the issues. Scott devised the CHCC as a measure to increase patient access to his services as well as increased efficiency within his clinic. The general CHCC as designed by Scott includes elderly individuals who encounter numerous physiological chronic conditions. Differences between the general CHCC and the specialty CHCC is that the latter focuses on specific chronic conditions such as diabetes, hypertension, obesity, etc., and is open to all age groups encountering a similar diagnosis (Noffsinger & Scott, 2000a; Scott et al., 1996). The general CHCC group format is comprised of monthly meetings that last for two and one half hours and consist of 10 to 15 participants. Among the specialty CHCC model, meetings may take place only three or four times per year, and consistency of patient participation is less important than providing disease specific psychoeducational information and care (2000).

Noffsinger created the DIGMA in 1996 in a similar response to Scott's frustrations with inefficiency in patient care (Noffsinger & Scott, 2000b). Similar to the

CHCC, the DIGMA is medical appointment designed to provide patients increased access to healthcare providers by offering extra time with physicians within a group setting.

However, the model as proposed by Noffsinger aims to provide certain needs surrounding only the physician's panel of patients (Noffsinger, 1999). Under this model, Noffsinger asserts that there is very little continuity of patients due to the ability for any patient of any age with any condition to attend (1999). Patients utilize this model most often as a suitable means to check in with physicians on a previously identified health concern (1999). Visits under the DIGMA model generally take place on a weekly basis for 90 minutes.

It is important to note that another difference between both CHCC models and this one is that the topic focus of the DIGMA may come from whatever the patient panel presents, whereas the CHCC models follow topics more closely related to chronic conditions (1999). Further differences between the two are that the CHCC model is designed for persons who are high utilizers of healthcare such as persons with multiple morbidities whereas the DIGMA is geared for the "worried well", or persons who are at risk of developing multiple health issues yet they are still able to make significant changes that may positively impact their health (Noffsinger, 1999). Under both designs, the group appointments are co-facilitated by a physician and a health psychologist, or other behavioral health professional.

As earlier stated, the tenets of the ICCCF recommended that healthcare work towards increasing healthcare outcomes by helping individuals increase their awareness of conditions, increase access to available resources, and encourage self management

(Epping-Jordan, 2005). Furthermore, these proposals sanctioned collaborative healthcare among primary care and behavioral medicine (2005). Under both models, the goal is to alleviate burdens of time and efficiency put upon practitioners, improve patient access to providers, and thus improve patient and practitioner access (2000).

Since Engel proposed the movement towards a biopsychosocial approach, various programs aimed at synergy among primary care and behavioral medicine have come forth. As a result, progress, research and application in advancements of preventive healthcare have produced advancements towards ameliorating health behaviors among persons encountering chronic illness. Continued implementation of programs that build awareness of health maintenance and adoption of beneficial health behaviors such as the DIGMA will undoubtedly play a central role in health psychology and medicine far into the future.

Design Overview

Questioning related to this study is in response to the current need for this type of research to be conducted in this area. Due to the prevalence of hypertension today, (JNC VI, 1997; Kottke, et al, 2003; Gatchel, et al., 2003), the primary purpose of this study was to evaluate whether there was a significant impact of the DIGMA program intervention upon individuals with hypertension as demonstrated by measurable changes in blood pressure and self reported modifications in health practices. Furthermore, in response to the need for understanding the impact of psychosocial dimensions upon health (Nicasso, et al, 2004; Smith et al, 2004), the association of these factors with the adoption of

proposed health promoting behaviors were studied. These were perceptions of stress as well as coping strategies in relation to one's chronic health condition of hypertension.

The research questions are as follows: Does participation in the DIGMA program significantly impact the stability of participants' blood pressure? It was posited that participation in the DIGMA program will account for significant decreases in both systolic and diastolic blood pressure. Furthermore, it was put forward that there would be more significant differences between pre and post-intervention systolic and diastolic blood pressure readings among those who completed the DIGMA intervention than those who did not complete the program. Based on current needs for examining the efficacy of health promoting programs (Anderson, et al, 2000; Von Korff, et al, 2002), the second research question asked if there a significant relationship between DIGMA program participation and subsequent adoption of health promoting behaviors? It was hypothesized that beneficial health behaviors would significantly increase among individuals who successfully participate in the proposed program. The third query was related to one's coping strategies upon ones physiological and psychological health (Lazarus & Folkman, 1984; Folkman, et al, 1986). Considering the relationship between coping strategies (adaptive and maladaptive) and adoption of new health behaviors, it was posited that one's coping mechanisms would significantly predict adoption of positive health behaviors. The nature of the relationship between coping strategies and significant changes in blood pressure after exposure to the proposed program was explored in the fourth research question. It was expected that coping mechanisms would significantly predict blood pressure changes after completing the DIGMA program. The

final research question was in response to research illustrating stress and its association to disease (Selye, 1976; Spiegel, 1993; Ornish, 1984). Linked with this, the current study was interested in determining whether differences in perceptions of stress impact the possibility of adopting new health promoting behaviors. It was put forth that participants who did not report elevated perceptions of stress would be more proficient at adopting new health behaviors than those who expressed higher levels of perceived stress.

In addition to assessment of blood pressure readings and self report measures, qualitative information was also sought from participants. It is expected that this information helped illuminate what the participants attributed to behavior and health changes. In addition to evaluating the influence of stress perceptions and coping styles among individuals diagnosed with hypertension, a further aim of the intervention was to improve the efficiency of care provided to hypertensive patients and introduce the possibility of self-initiated health-behaviors. Currently, the DIGMA is an ongoing medical program in place at the Austin Veterans Administration Outpatient Clinic (VA-OPC), developed to improve the efficiency of care provided to hypertensive patients and introduce the possibility of self-initiated health-behaviors. This dissertation functioned as an evaluation that hopefully elucidated our progress towards these goals.

In addition to assessing the aforementioned variables, it is important to clarify that there was a co-investigator involved with this study. This co-investigator gathered additional data from this population in order to examine psychological constructs similar to elements of interest of this proposed study. These additional constructs of interest

included levels of locus of control and self efficacy in relation to one's physical wellbeing.

Chapter 3: Methods

Study Design:

All research was conducted at the Austin Veterans Administration Outpatient Clinic (VA-OPC), a federally funded local outpatient medical treatment center. First, pre-screening took place in order to determine persons who identified as hypertensive. After being pre-screened, prospective participants were contacted by telephone and invited to take part in a program geared towards helping individuals who suffer from hypertension learn ways in which to better manage their own health. Individuals who agreed to program enrollment were asked to attend four meetings in total in addition to one brief telephone contact after the intervention. Before beginning participation, all participants completed a set of self-report psychological inventories during an initial orientation meeting. One week afterward, the participants attended the first of three components of the intervention. Each meeting occurred weekly for an hour and a half on Wednesday mornings from 10:30am to 12pm. During each meeting, primary care practitioners were hand to monitor subjects' physiological well-being and make any necessary changes to treatment. This study took place over the course of four separate face-to-face appointments and one telephone meeting. The structure of these meetings included one orientation meeting, three group appointments as well as one individual telephone interview appointment. Thus, including recruitment procedures, the study facilitator had contact with the participants over five different time periods. Each participant individually self reported on assigned measures administered by the study co-facilitators. These self report measures included the Health Promoting Lifestyles Profile II, the Health Locus of Control, the Self Efficacy Scale-Hypertension version, the

Perceived Stress Scale, the Brief COPE-Hypertension Version, as well as a demographic instrument. Primary care physicians of the AustinVA-OPC assigned a diagnosis of hypertension to prospective participants. This existing diagnosis functioned as initial screening for the study. Subjects participated in a group based medical appointment, functioning as an intervention related to the diagnosis of hypertension. At the beginning of each session, blood pressure of each participant was taken using a blood pressure cuff. These readings were used to track data (blood pressure and heart rate readings) before each of the three weekly group meetings. During each of the group appointments, the primary care practitioner identified any blood pressure and heart rate changes during the group medical appointments. As stated earlier, primary care staff made any necessary adjustments to patient treatment. At the end of the three week intervention, the researcher contacted a random sampling of group participants in order to collect information they found helpful regarding the intervention.

Participants

Demographic Information:

The source of potential participants was the Central Texas Veterans Healthcare system (CTVHCS). There was no exclusion of any racial/ ethnic group in the recruitment of participants for this study. Recruited participants were military veterans who had hypertension as diagnosed by CTVHCS medical personnel. Hypertension is a pervasive chronic health disorder inflicting 37% of the entire VA patient population (Yu et al, 2003). Characteristics of this disorder include elevated systolic blood pressure readings at or above 140mm/Hg and diastolic blood pressure readings at or above

90mm/Hg. Because of the high percentage of men receiving care from the CTVHCS, the entire sample of study participants were men. Additionally, this study screened participants for medical or psychological conditions that may have inhibited optimal functioning of the group intervention. These criteria included physiological diagnoses of hearing loss and psychological diagnoses of various Axis One disorders as defined by the Diagnostic and Statistical Manual of Mental Disorders vol. 4 text revision (DSM-IV TR). These psychological diagnoses include dementia, schizophrenia and schizophrenia related disorders as well as other psychotic disorders such as dissociative disorders and mental disorders due to a general medical condition. In addition, other psychological exclusionary criteria included a diagnosis of any Axis Two disorders as defined by the DSM-IV TR. A review of patient medical files assessed these exclusionary criteria. For the purposes of this study, there was a proposed goal of sixty subjects. However, due to the exploratory nature of this evaluation, recruitment continued past this intended number of participants.

Procedure

Obtaining Consent:

A primary care physician at the Veterans Administration-Outpatient Clinic (VA-OPC) provided initial patient diagnoses of hypertension. Primary care staff presented to the study facilitator the names of prospective participants who possessed this diagnosis. In addition to this information, the research facilitator obtained supplementary diagnostic information of potential subjects through medical files including weight and medication information. Furthermore, this information included other medical and behavioral health

diagnoses which helped to assist the researcher in determining appropriateness of participation in this study. This information assisted in identifying qualifying participants by providing previously described exclusionary criteria. One month prior to the group medical appointment, the researcher contacted potential participants in order to inform them about the study. The researcher explained the potential benefits of obtaining clinical information from the population of interest, as well, to encourage prospective subjects to learn ways to help better manage their hypertension. The researcher explained to the prospective subjects that participation was completely voluntary, and that should they have chosen to not participate at any point, their level of care through the CTVCHS would not be affected. However, the researcher stated to prospective participants that they may benefit from continued attendance due to learning techniques to better manage their hypertension. Specifically, the prospective participants were told that this medical appointment did not take the place of their regularly scheduled appointments; rather, it acted as an auxiliary appointment with the primary healthcare team. As well as more time with the primary care team, prospective participants had access to additional resources such as time with a pharmacist and behavioral health care staff.

If, through this initial telephone contact, potential participants expressed a desire to participate, the researcher provided the primary care staff with prospective attendee information in order to enroll the individual. Enrolled individuals received confirmation via mail communication regarding registration of the group medical appointment. This appointment confirmation included the date, time, and location of appointments as well as clinic contact information. The researcher asked the enrolled participants to come into

the clinic prior to onset of the first scheduled appointment in order to read and sign a consent form (see Appendix G). At this point, the researcher answered any questions so that the participants were fully informed of procedures and inherent risks of the study prior to participation. Participants signed the consent form prior to participation of study. It is important to note that by giving consent, participants authorized researcher to have 1) follow-up phone contact one week after completion the of group intervention, and 2) access to their medical records for a five-year period. After the participants read the consent form and had all of their questions answered, they were asked to sign and date the consent form. Afterwards, a witness signed the form to confirm that the participant has read and signed the consent.

Study Administration:

This study will take place at the Austin Veterans Administration Clinic (VA-OPC) through the Central Texas Veterans Healthcare system (CTVHCS), where a primary care practitioner (physician, nurse practitioner), and nursing staff (Registered Nurse, RN.) were present throughout each administration of the intervention in the event of any unforeseen medical complications. Furthermore, behavioral healthcare staff (including psychologists and doctoral student level therapists) attended each of the meetings. The study took place over the course of five separate appointments, and each participant was observed for changes in health status during each of the in-group intervention meetings by examination of any changes in blood pressure readings.

Furthermore, primary care practitioners observed any significant changes to health status by asking participants if they are experiencing any physiological problems.

Appointment One:
Orientation Meeting

In order to take part in this research study, members were required to attend an initial orientation meeting. Orientation meetings are frequently utilized in group counseling to allow the participants the opportunity to become familiar with the focus of the group as well as permit the facilitators to establish the group norms. As well as familiarizing the participants to the group tenets and focus, this appointment acted as an introduction session to the program where the group facilitators explained informed consent required to take part in this study. Moreover, participants were told that agreement of confidentiality and providing written informed consent was a condition of participation of the program. In addition, facilitators answered any questions that the participants may have had regarding the program. After reading and signing the applicable consent forms, the participants filled out a packet of inventories evaluating perceptions of stress, coping styles, health practices, and a demographic inventory assessing various lifestyle and health-related variables. As previously mentioned, in addition to this information, supplementary data collected from the other co-facilitator examined participants' levels of self efficacy and locus of control in relation to their health. Although not considered the key elements to this proposed study, these latter variables helped to provide auxiliary data that supported the examination of differences in stress perceptions and coping styles.

To guarantee the confidentiality of each subject's response to the self-report questionnaires and throughout the study, the researcher utilized participant ID numbers, rather than names or any other identifying information used to denote and organize verbal, written, and physiological data. All data and medical files were kept confidential by the established standards and practices of the medical personnel or the CTVHCS system.

Appointment Two:
Intervention Group Meeting One

At the beginning of the first session, participants were checked in with the group facilitators at the assigned meeting room. At this time, participants were offered a name tag in order to facilitate group communication during the program. Following check in, participants received their measurement of blood pressure readings administered by a registered nurse. After receiving their blood pressure readings, participants were introduced to group facilitators and other staff members. Following staff introductions, group leaders reminded members that the meetings were considered a medical appointment and therefore the facilitators stressed the importance of confidentiality among the participants and staff. Subsequent to the disclosure of confidentiality, group facilitators invited group members to participate in an introductory group exercise. This assignment functioned as an introduction group activity where group members spent a few minutes getting to know the person or persons sitting close to them. Afterward, each member took turns introducing one or more of their neighbors. In addition to meeting their neighbors, the objective of this task was to build cohesion among participants and facilitators. In addition to building cohort rapport, this exercise operated as a tool to

introduce participants to each other and to the staff. Upon completion of this rapport-building exercise, group facilitators provided a general list of goals covered over the progression of the program. These goals included various factors aimed to bolster psychological as well as physiological health promoting behaviors that could as a result lead to effective management of hypertension. These factors consisted of learning how to manage emotional stress and becoming more aware of the importance of nutrition maintenance. As well, other factors discussed included building an understanding of the effectiveness of moderate physical exercise as well as understanding the importance of prescription medication compliance. In addition, participants were given a personal log and a personal blood pressure monitor. This equipment was used to help individuals learn to self examine and monitor their daily blood pressure.

Based on these topics, the group facilitators informed the participants of the prospective program schedule. The topic that the program concentrated on for this first group meeting was stress management. The following week the program focused on nutrition whereas the third week covered pharmacological information and exercise practices.

As stated earlier, the emphasis for this meeting was on stress management. Facilitators attempted to elicit group communication related to stress by providing examples that illustrated associations between emotional stress and physiological well-being. More specifically, facilitators strove to help group members explore the effects of emotional stress on hypertension. Emphasis was placed upon the cognitive appraisal of perceptions of stressful situations and the impact that these appraisals may have upon

physiological health. The group leaders attempted to foster discussion among the group members geared towards discovering new ways in which to manage emotional stress.

Appointment Three:
Intervention Group Meeting Two

Following check in with the group facilitators, each participant received a blood pressure reading administered by a registered nurse. After blood pressure assessment, group facilitators welcomed back participants to the program. At this time, the facilitators reminded the participants of the necessity of confidentiality in order to continue participation.

In order to facilitate group discussion, group leaders reviewed the prior week's topic of discussion and invited participants to share any thoughts regarding the previous meeting. Following the review of last week, group leaders introduced the current program objective of nutrition awareness. The topic of attention to nutrition included information applicable to individuals diagnosed with hypertension, such as examining the impact of weight control on health. Group leaders encouraged discussion linked to difficulties that may exist in successfully managing weight. Members were invited to actively participate in exploring new ways to effectively tend to their weight control. Furthermore, based on information received from a consultant nutrition specialist, facilitators has access to basic information regarding daily dietary nutrition guidelines and provided information to participants upon request. This information included paying attention to reading labels on food packages in order to assess sodium, fat, sugar and carbohydrate content. Moreover, based on the information provided by the nutrition specialist, group leaders had access to material which provided participants with

information concerning different types of fats (such as differences between saturated and unsaturated fats as well as respective benefits and risks). It is important to note that group discussion originated from, but was not constrained by these specific nutritional matters. Group leaders invited participants to explore other areas of nutritional concern.

Towards the conclusion of this meeting, group leaders reminded participants that the upcoming final appointment would cover medication compliance and physical exercise. Facilitators invited participants to bring in their questions regarding their medications to the staff pharmacist during this final group gathering. Moreover, participants were invited to bring in their prescribed medications in order to show the pharmacist what medications they are currently taking.

Appointment Four:
Intervention Group Meeting Three

Subsequent to checking in for the third appointment, a staff nurse measured each of the participants' blood pressures. Following the pattern of the preceding meetings, group leaders welcomed back the members and reminded them of the previously agreed upon confidentiality agreement.

Group leaders asked the group members if they had any questions regarding the past week's subjects. After answering any questions and reviewing any information related to the discussion from last week, the group facilitators introduced the staff pharmacist to the group members. The pharmacist invited discussion and answered any questions related to medication. The pharmacist discussed the importance of taking blood pressure medicine as prescribed. Furthermore, the pharmacist talked about the significance of reporting any adverse side effects to primary care staff. The pharmacist

acquainted the participants with the availability of the pharmacy staff to answer any questions regarding medications.

In addition to discussing pharmacological factors of hypertension, the program explored the value of exercise on health. The group facilitators focused the investigation of exercise on the benefits of moderate physical activity that promote increases in circulation, decreases in blood pressure and healthful weight control. Group leaders helped to facilitate discussion in which members could explore techniques that may assist in their increase of daily exercise. Facilitators stressed the importance of safely incorporating physical activity into one's daily routine. In order to illustrate increased awareness of physical activity, group leaders discussed the application and usage of pedometers to the group members.

This last group meeting functioned as the final program intervention. At the end of this appointment, participants were asked to complete a second list of inventories. This is the same battery of inventories that was completed at the onset of the intervention. However, the information gathered from this set of questionnaires provided the post-intervention data.

It is important to note that throughout each of the group sessions that if necessity arose, qualified primary care practitioners would withdraw the participants on an individual basis in order to assess or modify treatment plans related to their hypertension.

Phone Contact Session:

One week following the last group meeting, the group facilitators contacted participants through telephone communication. The purpose of this telephone contact

was to qualitatively assess the efficacy of this program from the perspective of the attendees. In addition to asking participants who completed the program about their opinions, the researchers contacted participants who withdrew from the program prior to the last meeting time. These questions helped explore reasons that this group of individuals did not complete the intervention. Thus, qualitative, open-ended questions attempted to capture aspects of the program that both types of participants may have found valuable or problematic.

A summary of the DIGMA sessions are illustrated in Chart 1.

Chart 1: DIGMA Session Summary:

Pre meetings: Chart Review and Telephone Recruitment

Orientation session: Informed consent and baseline measures

Session 2: Initial BP reading; Stress Component

Session 3: Nutrition and Exercise

Session 4: Medication compliance
Post BP reading and post test measures

Telephone session: Contact to assess qualitative component

Measures

To evaluate the program with the target population, participants were asked to fill out self report instruments given prior to the first program meeting and again after the end of the third appointment. The following inventories assessed various psychosocial, health-related variables under investigation as well as demographic information in these individuals: the Health Promoting Lifestyles Profile II (HPLP-II) for health promoting behavior; the Perceived Stress Scale (PSS), which measures one's perceptions of degree of stress; the Brief COPE (revised for Hypertension) which appraises coping styles; and a demographic inventory, used for evaluating various physiological and social background information. Furthermore, qualitative questions designed to evaluate the effectiveness of the program are included. A brief description of each of these inventories follows:

Perceived Stress Scale- See Appendix B

Stress Measure:

The Perceived Stress Scale (PSS) is a 14 item measure intended to evaluate the degree to which situations in one's life are appraised as stressful (Cohen, Kamarck & Mermelstein, 1983). According to Cohen and Williamson (1988), this instrument is designed to assess the perceived degree to which environmental pressures outweigh one's capacity for coping with them. Simply put, "how unpredictable, uncontrollable, and overloaded respondents find their lives" (p. 34). This instrument was intended for use with community samples with at least a 6th grade education. Totals are calculated by reversing the scores on the seven positively worded items and then summing across all 14

items (Cohen et al., 1983). The authors report that PSS correlates with “life event scores, depressive and physical symptomology, utilization of health services, social anxiety, and smoking-reduction maintenance” (Cohen et al., 1983, p. 385). The PSS demonstrated adequate reliability (Cronbach’s $\alpha = .75$) within samples of college student and non-student populations. Within this current study, the Cronbach’s alpha = .85.

Cohen et al (1988) assert that the PSS does not connect appraisal of stress to specific circumstances, rather, the authors state that the instrument is responsive “to the nonoccurrence of events as well as to ongoing life circumstances, to stress resulting from events occurring in the lives of friends and relatives, and to expectations concerning future events” (34) and is non-specific to any particular subgroup.

Construct validity of the PSS was determined through various factors. Cohen et al (1988) posit that the PSS more effectively predicted perceived stress than instruments assessing psychological and physical symptoms as well as healthcare utilization. Initially, this was established by measuring correlations between the PSS and other instruments assessing stress such as the Life-Events Scale (LES) and the Job Responsibilities Scale (JRS). Findings indicate that items in the PSS were moderately related to responses on other measures of appraised stress, as well as to measures of potential sources of stress as assessed by event frequency (Cohen et al., 1988). In addition, there is a significant association between elevated stress perceptions as determined by PSS scores and self-reported physical illnesses. Both frequency and symptoms of illness were positively associated with higher PSS scores. Statistically significant correlations were also observed between elevated PSS scores and self-report

of health behaviors. Most notable of these associations were high PSS scores and shorter periods of sleep, irregular dietary habits, elevations in alcohol and illicit drug usage. For example, Cohen et al (1988) found that individuals with elevated PSS scores were associated with an inability to quit smoking and those with diabetes who had poor control of blood sugar levels also tended to measure higher than control groups. Furthermore, Cohen et al (1988) reveal that the PSS has been utilized as a criterion variable associated with factors of personality, coping processes and stressful life events.

Brief COPE Revised Hypertension version- See Appendix C

Coping Measure:

For this proposed study, the researchers utilized a modified instrument based on the Brief COPE, a condensed 28 item measure adapted from the COPE inventory developed by Carver, Scheier, & Weintraub (1989). The full COPE is a 60 item instrument constructed to assess adaptive or problem/ solution focused coping strategies and maladaptive focused coping strategies. Carver et al (1993) assert that the full COPE scale has been utilized with a number of related studies. Furthermore, Carver (1997) specifies that many of the coping responses that the full COPE assesses are essential in the coping process and some are predictive of prospective physiological effects. The full version of the COPE instrument contains 15 subscales with 4 items per subscale.

According to Carver, Pozo, Harris, Noriega, Scheier, Robinson, Ketcham, Moffat, & Clark (1993), considerable redundancy exists within each of the 4 items per subscale. Thus, Carver et al (1993) have found that due to length and redundancy, patient samples

have grown impatient with completing the full version of this instrument. Each of the 14 scales of the Brief COPE consists of two items each, therefore reducing the chance for subject impatience during administration due to repetition and length (1993). The Brief COPE measures 14 conceptually distinct coping responses. Some of these responses are viewed as adaptive whereas others are considered more maladaptive in nature (Carver, 1997). The 14 subscales of the Brief COPE instrument and their respective coefficient alphas are as follows: Active coping, .68; Planning, .73; Positive reframing, .64; Acceptance, .57; Humor, .73; Religion, .82; Using emotional support, .71; Using instrumental support, .64; Self distraction, .71; Denial, .54; Venting, .50; Substance, .90; Behavioral disengagement, .65; Self blame, .69. It is anticipated that individuals who endorse 'active coping', 'planning', 'positive reframing', 'acceptance', 'humor', 'using emotional support', 'using instrumental support' and 'religion' utilize more adaptive (i.e., solution) focused coping strategies than individuals who select items that load on maladaptive focused coping subscales such as 'self distraction', 'denial', 'venting', 'substance usage', 'behavioral disengagement', or 'self blame'. For this study sample, aggregate reliability coefficient alphas for adaptive and maladaptive coping are in line with the previous study, and are as follows: Adaptive coping, .63; Maladaptive coping, .66. Individual subscale coefficient alphas are as follows: Active coping, .51; Planning, .1.00; Positive reframing, .50; Acceptance, .56; Humor, .69; Religion, .74; Using emotional support, .70; Using instrumental support, .51; Self distraction, .67; Denial, .48; Venting, .50; Substance Abuse, .60; Behavioral disengagement, .50; Self blame, .80.

Reliability of the brief COPE instrument was initially measured using a convenience sample of 126 participants from a study assessing coping mechanisms of survivors of Hurricane Andrew (David et al., 1996; Ironson et al., 1997; as cited in Carver, 1997). Carver (1997) asserts that although the number of participants was negligible, the advantage of using these participants is different from traditional college student populations in that their circumstances stemmed from real life stressors.

Carver (1997) suggests that the Brief COPE is aimed at promoting a greater assessment of coping in “naturally occurring settings” (p. 98), and further proposes that utilizing this instrument need not be in an “all-or-none fashion” (p. 98). Thus, researchers are able to manipulate the scales that are of importance to their interests. Furthermore, Carver offers that one can design the item instruments to reflect either retrospective, concurrent, or dispositional application (1997). In order to gear the inventory more directly to a population diagnosed with hypertension, this study utilized a form of the Brief COPE designed to assess coping strategies with reference to the respective health condition.

As a result of the unidirectional method of this instrument, it was possible for individuals to measure high on multiple domains of coping strategies. More specifically, due to the design of the instrument, if an individual measured high on a certain adaptive coping strategy, one could not deduce that they would therefore measure low on a maladaptively charged coping strategy. As a consequence, this instrument did not categorize persons into one type of coping strategy or another in order to distinguish core coping strategies. Rather, the Brief Cope evaluated the degree of various coping strategies an individual

employed in relation to their health condition. For this reason, it was decided to aggregate positively charged coping strategies to represent adaptive coping strategies. Thus, the subscales representing the adaptive coping strategies are as follows: Active coping, Planning, Positive reframing, Acceptance, Humor, Religion, Using emotional support, and Using instrumental support. Similarly, the subscales of Self distraction, Denial, Venting, Substance Abuse, Behavioral disengagement, and Self blame were combined to embody maladaptive coping strategies.

Health Promoting Lifestyles Profile II (HPLP II)- See Appendix D

Health practices measure:

The HPLP II (Walker, Sechrist & Pender, 1995) is a 52 item instrument which utilizes a 4-point Likert format (1 = never. 4 = routinely) and measures the frequency of respondents' engagement in health-promoting behaviors. This instrument has been used at length to assess behaviors intended for decreasing the impact of illness and promoting wellness. Higher scores indicate higher frequency of health-promoting behavior. Items I the full scale of the HPLP-II comprise six subscales: Interpersonal relations, nutrition, health responsibility, physical activity, spiritual growth, and stress management.

Interpersonal relations focuses on using communication to increase intimacy and closeness in relationships with important others (Travis & Ryan, 1988; Walker, Sechrist & Pender, 1987; as cited in Noble-Walker & Hill-Polerecky, 1996). Some examples of items from this subscale include: *I discuss my problems and concerns with people close to me; I get support from a network of caring people; and I maintain meaningful and*

fulfilling relationships with others. Nutrition entails making smart food choices that aid in one's overall health and follow the Food Guide Pyramid guidelines (Ardell, 1986; USDA, 1992, USDHHS, 1988; as cited in Noble-Walker & Hill-Polerecky, 1996). Item examples include: *I limit use of sugars and food containing sugar (sweets); I choose a diet low in fat, saturated fat, and cholesterol.* Health responsibility denotes taking control of one's own well-being, including focusing on and learning about one's health as well as becoming an effective consumer when obtaining professional support (Ardell, 1986; Travis & Ryan, 1988; Walker, Senchrist, & Pender, 1987; as cited in Noble-Walker & Hill-Polerecky, 1996). An example of items measuring this construct include: *I report any unusual signs or symptoms to a physician or other health professional; Question health professionals in order to understand their instructions.* Physical activity consists of consistent engagement in light, moderate, or heavy exercise. The regimen may or may not consist of a prescribed and monitored program based on health or fitness (Bouchard, Shepard Stephens, Sutton, & McPherson, 1990; Dishman, 1988; USDHHS, 1991; as cited in Noble-Walker & Hill-Polerecky, 1996). Examples of this subscale are as follows: *I exercise vigorously for 20 minutes or more at least three times a week (such as brisk walking, bicycling, aerobic dancing, using a stair climber).* Items from each subscale are distributed throughout the instrument. The HPLP II is based on the HPLP (Walker et al., 1987).

Data from 712 individuals aged 18 to 92 were used to determine reliability and validity. High internal consistency was established with coefficient alphas ranging from 0.70 to 0.90 for individual subscales and 0.92 for the entire instrument. Reliability of the

HPLP II was established with Cronbach's alphas as follows: Interpersonal relationships, .87; Nutrition, .80; Health responsibility, .86; Physical activity, .85; Spiritual growth, .86; Stress management, .79. Factor analysis between the HPLP II and the Personal Lifestyle Questionnaire helped support the construct validity of the six factor dimensional structure of health-promoting lifestyle ($r=.678$). Stress was measured using the Perceived Stress Scale (PSS), and the construct of spiritual growth was assessed as a coping mechanism in the Brief Cope. Due to the large number of instruments administered, it was decided to amend the length of items given to the study participants. Therefore, it was determined that these respective subscales from the HPLP-II were inconsequential to administer. Thus, only four (including interpersonal relations, nutrition, health responsibility, and physical activity) of the six subscales were used, making a total of 35 items utilized from this instrument. The Cronbach's alphas for these respective subscales utilized in this study are as follows: Interpersonal relationships, .74; Nutrition, .71; Health responsibility, .81; Physical activity, .82.

Demographic Information-See Appendix A

Demographic information was obtained from a self-report inventory. This inventory included questions about each participant's age, weight, ethnicity, marital status, employment status, occupation, household income, educational background, exercise regimen, diet, heart-rate, use of drugs, alcohol and tobacco history, medical history, current use of medications, and sleep patterns.

Qualitative Inquiry-See Appendices E&F

Qualitative based information were collected by the two co-investigators with the purpose of examining program characteristics that both participants who successfully and do not successfully complete the program may have found valuable or problematic. An example of a question evaluating the experiences of both sets of participants who complete and do not complete the intervention is: “What was your experience of the DIGMA program like?”. For the latter group, questions asked will attempt to reveal reasons for noncompliance, such as: “Were there shortcomings in the DIGMA program that prevented you from attending?” and “What would be some things that you believe would help enhance the program?” The goal for one set of these questions will be to assess cognitive processes related to changes in health behaviors among participants. More specifically, these questions attempted to examine what changes have been made, if any, to health behaviors. Furthermore, these questions asked the participants what they believed caused them to make any changes, if any were made. An example of this is: “What do you feel that you can attribute to changes in your health, if any?” Other questions will look at what aspects both types of participants found useful or challenging about the program. (See appendices E & F for a complete list of interview questions).

Apparatus

Automated Heart Rate and Blood Pressure Cuff

The participants’ blood pressure and heart rate was calculated with a sphygmomanometer cuff attached to an automated, portable digital monitor. These

automated machines are beneficial due to eliminating observer sources of error in blood pressure assessment (Krantz & Falconer, 1997). As the blood pressure cuff automatically inflates, it wraps around the upper arm. This inflation creates cuff pressure which collapses the blood vessels in the upper arm and prevents the blood from flowing into the or out of the forearm while the cuff pressure remains higher than the systolic blood pressure. Following this inflation, air in the cuff is slowly withdrawn and the blood pressure and heart rate are measured. If correctly executed, previous research suggests that this mode of blood pressure measurement is effective in providing a measure of blood pressure that highly correlates with intra-arterial measurement (correlation coefficients .94-.98) and is notably predictive of cardiovascular risk (Reeves, 1995).

STUDY HYPOTHESES

Research Question 1:

Does participation in the DIGMA program significantly impact the stability of participants' blood pressure?

Hypothesis 1a

Participation in the DIGMA program will account for significant decreases in both systolic and diastolic blood pressure.

Hypothesis 1b

There will be more significant differences between pre and post-intervention systolic and diastolic blood pressure readings among those who completed the DIGMA intervention than those who did not complete the program.

Research Question 2:

Is there a significant relationship between DIGMA program participation and subsequent adoption of health promoting behaviors?

Hypothesis 2

Beneficial health behaviors will significantly increase among individuals who successfully participate in the proposed program.

Research Question 3:

What is the relationship between coping mechanisms and adoption of new health behaviors?

Hypothesis 3

One's coping mechanisms will significantly predict adoption of positive health behaviors.

Research Question 4:

Is there a relationship between coping strategies and significant changes in blood pressure after exposure to the proposed program?

Hypothesis 4

Coping mechanisms will significantly predict blood pressure changes after completing the DIGMA program.

Research Question 5:

Do differences in perceptions of stress impact the possibility of adopting new health promoting behaviors?

Hypothesis 5

In embracing new health behaviors, there are significant differences among persons who report to have elevated perceptions of stress than those who do not. Individuals who do not report elevated perceptions of stress are more proficient at adopting new health behaviors than persons who express higher levels of perceived stress.

Data Analysis

Descriptive statistics by group, as well as an aggregate of all groups, helped to examine demographic components of the sample. Furthermore, descriptive statistics assessed biological and psychosocial measures.

A pretest/posttest design assisted in evaluating changes in mean scores on several variables over time. Data from distinct DIGMA cohorts over seven months were included. Analyses initially identified significant changes before and after DIGMA participation across the entire sample, aggregated and analyzed with a repeated measures analysis of variance procedure. Repeated measures analyses of variance helped to detect a trend of consistent changes across groups. In addition, other analyses examined the predictive relationship between variables of interest. In this case, hierarchical regression models were employed.

As well as utilizing the quantitative analysis, the study employed structured focus groups to collect qualitative data, revealing patients' experiences of the DIGMA in addition to their impressions concerning specific components of the intervention that initiated any behavioral changes. A random subset of DIGMA participants were chosen

participate in the focus groups. A semi-structured format were utilized to examine cognitive changes that may have arisen from involvement in the DIGMA. Qualitative and quantitative data were compared to uncover consistency among themes between focus group data and self-report scale data.

Chapter 4: Results

This study was designed to explore the effects of a doctor interactive group medical appointment (DIGMA) intervention upon a population of male veterans diagnosed with hypertension. The variables used to explore the effects of this intervention include perceptions of stress, coping resources/ strategies, adoption of healthy behavior changes, and significant differences in systolic and diastolic blood pressure. The following acronyms will be used throughout the results section for purposes of brevity: Doctor Interactive Group Medical Appointment (DIGMA), Perceptions of Stressful Situations (PSS), Brief Cope (BC), Health Promoting Lifestyle Profile (HPLP-II), systolic blood pressure (SPB), and diastolic blood pressure (DBP). The primary goal of this study is to gain insight into the effects of exposure to the DIGMA intervention for veteran males diagnosed with hypertension.

The results are presented in four sections. The first section focuses on the descriptive aspects of the sample and the results presented include the means, standard deviations, and frequency distributions of age, race, marital status, employment status, and household income, highest level of education, weight and current health status regarding smoking, alcohol frequency and current diet practices. These variables were further analyzed to determine if they differed significantly across the population, and these results are also presented.

The second section explores the research questions and the results of the study. These include tests of mean differences designed to explore distinctions among scores of participants before and after exposure to the intervention. Means and standard deviations

for each variable will be presented, as will the results from the main analyses. Multiple regression models are also used to assess whether the psychological variables of coping strategies and perceptions of stress examined in the study predict significant changes in health behaviors as well as noteworthy decreases in systolic and diastolic blood pressure.

The third section of this chapter explores at greater length some significant findings ascertained through investigation of the research questions. This exploratory investigation includes examining demographic variables of interest and their impact on the research questions, as well as significant results discovered through analysis of the research findings.

Lastly, the fourth component of this chapter evaluates the qualitative data collected. This data assesses the perspective of both the participants who successfully and did not successfully complete the program. Reasons for examining both types of responses are to determine what they may have found valuable or problematic with the purpose of examining program characteristics.

Descriptive Analyses

The present study included 71 male veterans from the Central Texas Veterans Health Care System (CTVHS). The participants were recruited from a pool of veterans previously diagnosed with hypertension. The ages of the participants ranged from 43 years to 86 years old ($M= 66$; $SD= 10.55$). The average weight of this population was 207lbs., and ranged from 165 to 350 lbs. The majority of individuals reported to have a family history of heart disease (43; 61%).

Most participants were Caucasian/White (38; 53.5%), with other subjects self identified as African American/ Black (19; 28.0%) and Hispanic/Latino (12; 17.0%). Two participants (2; 2.0%) listed their race as not fitting in any of the above categories (i.e., Other). Most of the sample was married (47; 65%), while others were single (5; 7%), divorced (16; 22%), or widowed (3; 4%). The majority of participants self identified as retired (47; 66%). The other subjects are either working full or part-time (17; 24%) or currently not working (7; 10%). 55 percent (n= 39) of the sample make less than \$30,000 each year, 23 percent (n= 16) of the participants has an annual household income between \$30,000 and \$59,000, and 23 percent (n= 16) of the participants make over \$60,000. In terms of educational background, a small number of participants only completed grade school (6; 9%), while others completed high school (26; 37 %), community college (17; 24 %), undergraduate (16; 22%), or graduate school (6; 8 %).

Various current health practices and history were also recorded for this population. Participants were asked to report amount of exercise as defined by engaging in a physical activity of at least moderate intensity and duration similar to brisk walking for 30 minutes several times a week. Seven percent (n=5) reported to exercise several times a day, while 54 percent (n= 38) reported to engage in some type of exercise activity several times a week. Others reported to exercise at least once a week (15; 21%) or at least once a month (10; 14%). When asked about their eating habits, some reported to consume high saturated fatty foods all most of the time (5; 7%), while others reported to eat high fatty foods at least some of the time (10; 14%). The majority described eating high fatty concentrated foods some of the time (45; 63%), while 15 percent (n= 11) stated

that they do not consume high fatty foods at all. When asked about their frequency of substituting low fat foods into their diet, some reported to almost always do so (14; 20%). Some participants stated to substitute low fat alternatives often (20; 28%) while the majority stated to do so sometimes (28; 40%) and a few reported to never substitute low fat alternatives (4; 6%).

When asked to indicate if they had participated in any recreational drug use in the past 24 hours, participants overwhelmingly reported to not have done so (69; 98%). However, one individual reported to have used a depressant (defined as either Valium, Rohypnol, heroin, etc. that did not include alcohol) and one individual reported to have used a hallucinogen (defined as marijuana, ecstasy, LSD, mushrooms etc.).

Participants were requested to report their current and past history of tobacco smoke practices. Ten percent (n= 7) of the study participants described themselves as current smokers while others reported to be ex-smokers (16; 23%) or non-smokers who never smoked (48; 68%). Of those who reported to have a current or past history of smoking, 37 percent (n= 26) reported to have done so for at least 16 years, while 20 percent (n= 14) reported to have smoked between 11 and 15 years, and others reported to smoke between 6 and 10 years (2; 6%) and 1-5 years (2; 3%).

Participants were asked to describe their approximate frequency of alcohol intake over their lifetime as measured by amount of drinks per week. A large amount of individuals (33; 47%) reported to not consume alcohol, whereas others reported to drink between 1 to 4 drinks a week (15; 21%). Thirteen percent (n= 9) of the participants stated to have consumed an average of 5 to 8 drinks weekly and 7 percent (n= 5) reported

to have consumed between 9 to 12 drinks during this period of time. Twelve percent (n= 9) stated that they have consumed more than 12 drinks weekly during their lifetime.

In terms of history of anxiety and depression, individuals were asked about current and past history of each, as well as whether they had been diagnosed with an anxiety or depressive disorder. The majority of participants (48; 68%) stated that they did not have any current issues with anxiety. Furthermore, a majority of participants (56; 79%) reported to not have any past issues with anxiety. In addition, a majority of individuals (51; 72%) reported to have no current issues with depression and 52 percent (n= 73) stated that they had no prior history of feeling depressed.

It should be noted that for the demographic variables of smoking frequency and current alcohol intake there is a moderate issue of negative skew, which suggests a negative, or idealizing “naysay” style of response pattern. This pattern also exists in greater magnitude within the drug use category. Additionally, due to this response pattern, these demographic variables include moderate to extreme positive kurtosis (extreme kurtosis defined as over the absolute value of 2.0 (Stevens, 1999)), further indicating the subjects exhibited a strong tendency to underreport these variables.

While some data was collected for all 71 participants, psychological data was only gathered for 58 participants. Twelve of the subjects with missing post-test measures of psychological data completed the pre-intervention questionnaire packet but missed the remainder of the required DIGMA meetings as well as the final DIGMA appointment meeting when the final post intervention questionnaire was administered. One participant missed the initial orientation appointment where pre-intervention questionnaires

including demographic information were administered. He attended all of the following appointments; however, without his demographic and pre-intervention information being collected, his post intervention information was excluded from all analyses.

In order to mitigate the effects of missing data on the analyses performed to answer the research questions, a data substitution procedure was performed if a subject completed at least 80% of the data on a particular inventory. This procedure substituted the mean of the responses the participant did complete on the inventory for each of the missing items. Table 1 outlines completed and missing data for each of the inventories analyzed in the study.

Table 1: Frequencies of Valid and Missing Data for Psychological Variables.

Variable	Valid	Missing
Health Promoting Lifestyle Profile II-Interpersonal Relations (Pre)	71	0
Health Promoting Lifestyle Profile II-Interpersonal Relations (Post)	58	13
Health Promoting Lifestyle Profile II-Nutrition (Pre)	71	0
Health Promoting Lifestyle Profile II-Nutrition (Post)	58	13
Health Promoting Lifestyle Profile II-Health Responsibility (Pre)	71	0
Health Promoting Lifestyle Profile II- Health Responsibility (Post)	58	13
Health Promoting Lifestyle Profile II-Physical Activity (Pre)	71	0
Health Promoting Lifestyle Profile II- Physical Activity (Post)	58	13
Brief COPE (Pre)	71	0
Brief COPE (Post)	58	13
Perceived Stress Scale (Pre)	71	0
<u>Perceived Stress Scale (Post)</u>	<u>58</u>	<u>13</u>

Note: The N of the valid and missing data for these psychological variables presented above represents the status of the data after the mean substitution procedure was conducted.

Other descriptive statistics for the psychological and physiological variables are presented in Table 2. When examining these variables, one issue with excessive kurtosis exists within the variable of systolic blood pressure pre-intervention readings. Although high, this variable was expected to be elevated prior to the onset of the intervention. Although not ideal, it was decided that at this level of kurtosis it was not necessary to correct this by transforming the data. All psychological inventories also demonstrated adequate kurtosis (extreme kurtosis is defined as over the absolute value of 2.0 (George & Mallery, 2007)). Furthermore, none of the univariate skew indices are greater than 3.0, which has been interpreted as a sign of extreme skew (George & Mallery, 2007).

Table 2: Descriptive Statistics for Study Instruments.

	N	M	SD	Min	Max	Skewness	Kurtosis
1. SBPpre	58	154.93	13.99	100.00	195.00	-.381	3.658
2. SBPpost	58	134.48	17.78	184.00	98.00	.447	.481
3. DBPpre	58	78.39	10.95	47.00	105.00	-.457	.64
4. DBPpost	58	68.72	12.73	41.00	92.00	-.131	-.827
5. HPLPIRpre	58	2.7375	.55	1.78	3.79	.115	-.839
6. HPLPIRpo	58	2.9406	.48	1.67	4.00	.022	.214
7. HPLPNUpre	58	2.5891	.54	1.44	4.00	.100	-.032
8. HPLPNUpo	58	2.7845	.516	1.89	3.89	.205	-.579
9. HPLPHRpre	58	2.4157	.538	1.56	3.56	.290	-.868
10. HPLPHRpo	58	2.7864	.589	1.44	4.00	.122	-.092
11. HPLPPApre	58	2.1013	.705	1.13	3.63	.478	-.706
12. HPLPPApo	58	2.4731	.679	1.13	3.75	-.060	-.780
13. PSSpre	58	35.4224	9.038	20.00	53.00	.043	-.784
14. PSSpost	58	34.2586	8.46	18.00	62.00	.488	1.100
15. BCADpre	58	40.4397	9.213	23.00	59.00	-.062	-.616
16. BCADpost	58	44.7759	9.514	22.00	62.00	-.009	-.618
17. BCMApre	58	21.3103	5.917	12.00	36.00	.499	.006
18. BCMApost	58	23.5172	6.087	13.00	38.00	.278	-.468

Abbreviations: SBP=Systolic Blood Pressure, DBP=Diastolic Blood Pressure, HPLPIR=Health Promotions Lifestyle Profile II-Interpersonal relations (pre and post, respectively), HPLPNU=Health Promotions Lifestyle Profile II-Nutrition, HPLPHR=Health Promotions Lifestyle Profile II-Health Responsibility, HPLPPA=Health Promotions Lifestyle Profile II-Physical Activity, PSS=Perceived Stress Scale (pre and post, respectively), BCAD=Brief Cope Adaptive Coping (pre and post, respectively), BCMA=Brief Cope Maladaptive Coping (pre and post, respectively).

Table 3 displays the bivariate correlations between the measures of interest. It is important to remark both pre and post intervention readings of perceptions of stress were not significantly correlated with either pre or post intervention systolic or diastolic blood pressure. However, perceptions of stress was significantly positively correlated with the post intervention measurements of maladaptive coping strategies, and negatively correlated with pre and post intervention interpersonal relations readings (as measured by one of the subscales of the HPLP II). Furthermore, the nutrition subscale component of the HPLP II was significantly negatively correlated with perceptions of stress.

As expected, all health promoting behavior subscales (nutrition, health responsibility, nutrition, and interpersonal relations) were significantly positively correlated. The interpersonal relationship subscale of the HPLP II was significantly positively correlated with both pre and post intervention readings of adaptive coping strategies (as measured by subscales on the Brief Cope instrument), as were all other subscales on the HPLP II except for nutrition.

Systolic and diastolic blood pressures were significantly positively correlated, as were the post-intervention blood pressure readings and the interpersonal relations component of health behaviors. Systolic, but not diastolic, blood pressure was significantly positively correlated with age.

Table 3

SBpr	DBpr	IRpr	NUpr	HRpr	PApr	PSSpr	Cadpr	Cmapr	SBpo	DBpo	IRpo	NUpo	HRpo	PApo	PSSpo	Cadpo	Madp o
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
.44**	1																
-02	-02	1															
-14	-11	.43**	1														
-08	-05	.56**	.52**	1													
-26	-10	.35**	.56**	.45	1												
.07	.13	-.57**	-.21	-.12	-.22	1											
-02	-01	.31*	.08	.35**	.18	-.03	1										
.16	.04	-.23*	-.06	-.16	-.01	.56**	.44**	1									
.41**	.34**	-.16	-.16	-.01	-.02	.08	.03	.06	1								
.23	.63**	-.07	-.10	-.05	-.01	.03	.09	.08	.59**	1							
-.09	-.15	.59**	.13	.42**	.19	-.40**	.14	-.12	-.26*	-.29*	1						
-.21	-.13	.25	.56**	.31*	.35**	-.23	.16	-.20	-.03	-.09	.43**	1					
-.07	-.19	.36**	.32*	.69**	.31*	-.16	.11	-.01	-.11	-.21	.71**	.56**	1				
-.23	-.22	.32*	.33*	.35**	.70**	-.21	-.03	-.08	-.15	-.18	.50**	.53**	.57**	1			
.04	.04	-.60**	-.28*	-.19	-.30*	.74**	.03	.43**	.02	.17	-.41*	-.38*	-.23	-.30*	1		
-.03	-.03	.28*	.15	.29*	.16	-.16	.46**	-.29*	-.20	-.13	.38**	.17	.28*	.14	-.10	1	
.03	-.09	-.29*	-.09	-.02	-.05	.33*	.18	.49**	.03	.27*	-.16	-.06	-.03	.00	.41**	-.49**	1

Abbreviations: SBP=Systolic Blood Pressure, DBP=Diastolic Blood Pressure, HPLPIR=Health Promotions Lifestyle Profile II-Interpersonal relations (pre and post, respectively), HPLPNU=Health Promotions Lifestyle Profile II-Nutrition, HPLPHR=Health Promotions Lifestyle Profile II-Health Responsibility, HPLPPA=Health Promotions Lifestyle Profile II-Physical Activity, PSS=Perceived Stress Scale (pre and post, respectively), BCAD=BriefCope Adaptive Coping (pre and post, respectively), BCMA=BriefCope Maladaptive Coping (pre and post, respectively). *p<.05, **p<.01

Results of Research Questions

Only information received from 58 of the 71 participants who initially consented were used in the psychological data analysis. These 58 individuals successfully completed all research requirements by attending each of the DIGMA intervention meetings. However, regardless of status of program completion, blood pressure data from all individuals who initially consented to participate in the program was examined to determine whether any systolic and diastolic blood pressure group mean differences existed among individuals who completed the DIGMA participation and those who did not.

The first research question examined whether participation in the DIGMA program significantly impacted participants' blood pressure. The first component of research question utilized two separate repeated measures ANOVAs in order to assess the dependent variables of systolic and diastolic blood pressure mean differences for repeated measurements of blood pressure. The repeated measurements of blood pressures were taken before and after the DIGMA intervention.

As part of research question one, I was interested in determining if both systolic and diastolic blood pressure were different as a function of both time (pre and post intervention measurements) as well as whether they completed the group (graduates versus dropouts). A 2X2 repeated measures MANOVA was utilized to examine this second component of research question one, with systolic and diastolic blood pressure measurements functioning as the dependent variables and group membership (i.e.,

DIGMA program graduates and dropouts), and time (pre and post intervention blood pressure readings) functioning as the independent variables.

The second research question considered the relationship between those who completed the DIGMA program and adoption of health behaviors. A one-way repeated measures ANOVA was used to investigate the relationship between DIGMA program participation and subsequent adoption of health behaviors as measured by the specific subscales of the Health Promotions Lifestyle Profile (HPLP II). Pre and post DIGMA intervention scores from the HPLP-II subscales of interpersonal relations (HPLP-IR), physical activity (HPLP-PA), health responsibility (HPLP-HR) and nutrition (HPLP-NU) functioned as the dependent variables against the independent variable of DIGMA program participation.

In a previous study, the role of coping strategies in predicting problem health behaviors was examined using a regression analysis (Rafnsson, Jonsson & Windle, 2006). Therefore, for questions three and four, similar modes of analysis were employed. For question three, I was interested in determining if coping strategies add any predictability above and beyond the pretest score of the respective health behaviors. Therefore, four separate hierarchical regressions were run in order to assess the predictive relationship between coping strategies as measured by pre and post intervention scores from the Brief Cope and the criterion of health behavior changes as measured by the pre and post intervention scores recorded from the HPLP-II subscales of interpersonal relations (HPLP-IR), physical activity (HPLP-PA), health responsibility (HPLP-HR), and nutrition (HPLP-NU).

Similarly, I was interested in understanding the predictive relationship between coping strategies and blood pressure. Therefore, research question four utilized two separate hierarchical regression analysis in order to determine the predictive relationship between coping strategies as measured by pre and post intervention scores from the Brief Cope and the criterion variables of pre and post intervention systolic and diastolic blood pressure changes.

Lastly, the fifth research question employed a two-way repeated measures ANOVA in order to evaluate the independent variable of DIGMA program participation and the dependent variables of pre and post intervention measurements of perceived stress as measured by the Perceived Stress Scale (PSS).

Research Question 1:

Does participation in the DIGMA program significantly impact the change of participants' blood pressure?

Hypothesis 1a:

Participation in the DIGMA program will account for significant decreases in both systolic and diastolic blood pressure. Group means and standard deviations are presented in Table 4.

Table 4: Blood pressure measurement. Means and Standard Deviations

Variable	N	M	SD
Systolic BP Pre	58	154.93	13.99
Systolic BP Post	58	134.44	17.78
Diastolic BP Pre	58	78.39	10.95
Diastolic BP Post	58	68.72	12.73

This hypothesis was tested using two, one-way within-subjects (repeated measures) ANOVAs with exposure to the DIGMA intervention as the independent variable factor and blood pressure functioning as the dependent variables. The univariate F test for systolic blood pressure was significant, indicating there was a difference between the pre and post intervention readings with regards to systolic blood pressure, $F(1,57) = 78.33, p > .01$. Moreover, the univariate F test for diastolic blood pressure was also significant, indicating there was a difference among participants' pre and post intervention diastolic readings, $F(1,57) = 50.28, p > .01$. Furthermore, the values for partial eta squared (η^2) are given. These values show the proportion of total variability attributable to the factors in question (i.e., the degree of association between an effect and the dependent variable). The effect sizes for systolic and diastolic blood pressure are .58 and .47, respectively. These values are considered to be in the medium-high range, suggesting the amount of variance accounted for between pre and post blood pressure readings accounted for a 58 percent difference in systolic blood pressure and a 47 percent difference in diastolic blood pressure. Table 5 gives the results of the univariate F-tests.

Table 5: Univariate F-Tests: Hypothesis 1a.

Variable	Hypo SS	Error SS	Hypo MS	Error MS	F	Sig. of Effect Size η^2
Sys BP	12166.75	8853.24	12166.75	155.32	78.33	<.01 .579
Dia BP	2713.11	8853.24	2713.11	53.95	50.28	<.01 .469

Hypothesis 1b:

There will be a significant interaction between systolic and diastolic blood pressure readings among individuals who completed the DIGMA intervention as opposed to those who did not complete the program. A comparison of each of the group means was conducted in order to determine significant differences between individuals who completed the DIGMA program and those who did not. Group means and standard deviations are listed in Table 6.

Table 6: Blood pressure measurement. Means and Standard Deviations

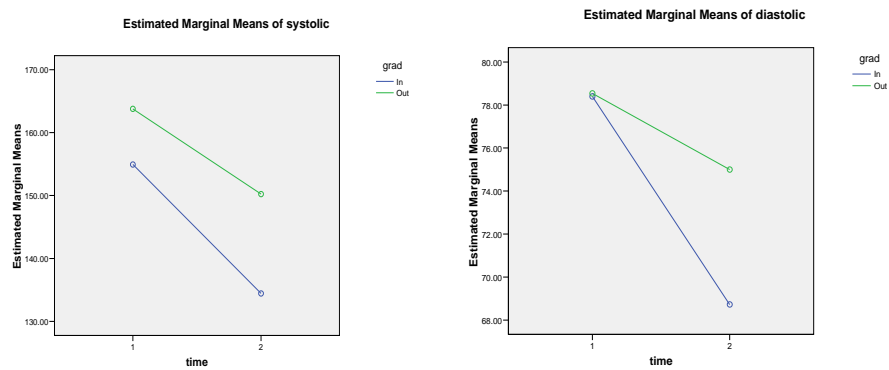
Variable	N	M	SD
Systolic BP Pre Graduates	58	154.93	13.99
Systolic BP Pre Dropouts	13	163.77	16.06
Systolic BP Post Graduates	58	134.44	17.78
Systolic BP Post Dropouts	13	150.23	15.43
Diastolic BP Pre Graduates	58	78.39	10.95
Diastolic BP Pre Dropouts	13	78.53	12.26
Diastolic BP Post Graduates	58	68.72	12.73
Diastolic BP Post Dropouts	13	75.00	10.17

Upon running a 2X2 repeated measures MANOVA, a multivariate F test revealed a significant main effect for the independent variable of time, (Wilkes $\lambda = .643$, $F(2,68) = 18.84$, $p < .01$, effect size (η^2) = .357), proposing a significant difference between pre and post intervention. Furthermore, a significant main effect for the independent variable of group membership (graduate or dropout) was discovered, (Wilkes $\lambda = .877$, $F(2,68) = 4.75$, $p < .05$, effect size (η^2) = .12), suggesting that there was a significant difference among groups. However, there was not a significant interaction between the independent variables of group membership and time against the dependent variables of systolic and diastolic blood pressure, Wilkes $\lambda = .948$, $F(2,68) = 1.87$, $p = .16$, $\eta^2 = .052$. Statistical findings for these analyses are located in Table 7. An example of these findings is illustrated in Figure 1.

Table 7: Univariate F-Tests: Hypothesis 1b.

Variable	Hypo	DF	F	Sig. of	
DV	IV	SS		F	
Systolic					
Time		6145.82	1	36.16	<.01
Group	3218.72	1	9.48	<.01	
Group x Time	256.05	1	1.50	.22	
Error	11726.85	69			
Diastolic					
Time		926.71	1	17.10	<.01
Group	218.70	1	.98	.32	
Group x Time	199.78	1	3.68	.05	
Error	3738.00	69			

Figure 1:



The number of participants studied for the remainder of the research (n=58) differs from the number of individuals examined with the previous two research questions (n=71). This difference reflects the number of participants who adhered to all of the protocols required for the psychological measures administered.

Research Question 2:

Is there a significant difference between pre and post DIGMA program participation and subsequent adoption of health promoting behaviors as measured by the HPLP-II subscales of interpersonal relations (HPLP-IR), health responsibility (HPLP-HR), physical activity (HPLP-PA), and nutrition (HPLP-NU)?

Hypothesis 2:

Beneficial health behaviors will significantly increase among individuals who successfully participate in the DIGMA program. This hypothesis was tested using a one-way repeated-measures ANOVA in order to examine mean differences among the independent variable of group participation and dependent variables of pre and post intervention scores assessing health behaviors (as measured by the HPLP-II subscales of interpersonal relations (HPLP-IR), health responsibility (HPLP-HR), physical activity (HPLP-PA), and nutrition (HPLP-NU). Table 8 displays group means and standard deviations.

Table 8: HPLP subscale measurement: Means and Standard Deviations

Variable	N	M	SD	Variable	N	M	SD
HPLP-IR Pre	58	2.73	.55	HPLP-IR Post	58	2.94	.48
HPLP-NU Pre	58	2.58	.54	HPLP-NU Post	58	2.78	.51
HPLP-HR Pre	58	2.41	.53	HPLP-HR Post	58	2.78	.58
HPLP-PA Pre	58	2.10	.70	HPLP-PA Post	58	2.47	.67

The Multivariate F test confirmed an overall significant main effect for time among the four dependent variables of health behaviors as measured by the respective subscales of the HPLP-II, $F(4,54) = 11.31, p < .01$. Univariate F tests illuminated all four of the dependent variables of the individual subscales displayed significance for changes across the independent variable of time, HPLPIR $F(1,57) = 10.65, p < .01$, effect size = .16; HPLPNU $F(1,57) = 8.95, p < .01$, effect size = .13; HPLPHR $F(1,57) = 39.57, p < .01$, effect size = .41; HPLPPA $F(1,57) = 27.97, p < .01$, effect size = .33. Statistical findings for these analyses are located in Table 9.

Table 9: Univariate F-Tests: Hypothesis 2.

Variable	Hypo SS	Error SS	Hypo MS	Error MS	F	Sig. of F	Effect Size η^2
HPLPIR	1.19	6.40	1.19	.11	10.63	<.01	.16
HPLPHR	1.10	7.05	1.10	.12	8.95	<.01	.13
HPLPNU	3.98	5.73	3.98	.10	39.57	<.01	.41
HPLPPA	4.00	8.16	4.00	.14	27.97	<.01	.33

To facilitate answering research questions 3 and 4, hierarchical regression models were constructed. This method of analysis is in line with previous research examining the role of coping strategies and health behaviors (Rafnsson, Jonsson & Windle, 2006). Additionally, earlier research examining the function of coping strategies in predicting distress due to psychiatric disorders (Singh, Sharan & Kulhara, 2003) and levels of grief (Sikkema, Kalichman, Hoffmann, Koob, Kelly, & Heckman, 2000) utilized regression analyses. Therefore, for questions three and four, similar modes of analysis were employed. For each model, the coefficient of multiple determination, R^2 , denotes the criterion, or dependent variable described through the model. The standardized beta coefficients (β) indicate the average standard deviation change in the criterion variable

associated with a standard deviation change in the predictor variable, when the predictor variables are held constant (George & Mallery, 2007). Likewise, the nonstandardized beta coefficients (b) denote the amount of raw score change in the criterion variable is related to the magnitude in the raw score of the predictor variable (2007). The t-values determine whether each predictor variable was a significant factor in in the prediction of the criterion variable while accounting for the effects of other predictors (Green & Salkind, 2005). The p-values determine the significance of the analyses. The standardized and nonstandardized coefficients as well as the t-values, p-values and R² of the model are presented.

Research Question 3:

What is the relationship between coping strategies and adoption of new health behaviors?

Hypothesis 3:

It was posited that the manner of one's coping strategies will significantly predict adoption of positive health behaviors. I was interested in determining which type of coping strategy would significantly predict health behaviors. In order to better understand this relationship, coping strategies as measured by the Brief Cope were partitioned into two subscales comprised of adaptive and maladaptive coping strategies. These coping strategies were segregated into adaptive and maladaptive coping strategies, as represented by the following subscales: Active coping, Planning, Positive reframing, Acceptance, Humor, Religion, Using emotional support, and Using instrumental support for the domain of adaptive coping strategies, and the subscales of Self distraction, Denial, Venting, Substance Abuse, Behavioral disengagement, and Self blame were combined to

signify maladaptive coping strategies. This was done in order to better understand which weighed strategies functioned effectively as significant predictors. Furthermore, I wanted to determine if differences in time (pre and post DIGMA intervention) had any bearing on this predictive relationship. Therefore, these respective adaptive and maladaptive coping strategies were further separated into pre and post intervention measurements. In order to test this hypothesis, a total of four hierarchical regression analyses were conducted to determine whether coping strategies (as measured by the adaptive and maladaptive subscales of the Brief Coping), significantly predicted the criteria of certain health behaviors (as measured by respective subscales of the HPLP-II). Adaptive and maladaptive pre and post-intervention coping strategies as well as the pre-intervention scores of each of the subsequent HPLP subscale scores were used to predict the criterion variable of each of the respective post-intervention HPLP subscale scores (as measured by the interpersonal relations (HPLP-IR), nutrition (HPLP-NU), health responsibility (HPLP-HR), and physical activity (HPLP-PA)). The following is a detailed description of each of the four regression analyses. Each of these four hierarchical regressions was comprised of five steps.

This first hierarchical regression analysis examined the predictive relationship between coping strategies and interpersonal relations as measured by the HPLP-IR subscale. The initial stage of this first hierarchical regression analysis examined the degree of significance the HPLP-IR (interpersonal relations) subscale pre-intervention score predicted the criterion of the respective post test score. Thus, when the pre test HPLP IR score was first entered, this model achieved statistical significance $R^2 = .35$,

$F(1,56) = 30.85, p < .01$. Following this, I was interested in determining the degree of predictability the variable of post adaptive coping scores had upon the criterion of the HPLP-IR post test score. Therefore, the predictor of post adaptive coping scores was then introduced into the model, which further displayed significance in predicting post intervention HPLP-IR scores $R^2 = .40, \Delta R^2 = .05, F(2,55) = 18.56, p < .05$. However, the change in R^2 was minimal; therefore, this initial significant finding should be noted with caution. Next, I added the pre-intervention maladaptive scores into the model in order to determine the predictive relationship with the criterion of the post intervention scores from the interpersonal relations HPLP-II subscale. However, this model did not achieve statistical significance ($R^2 = .42, \Delta R^2 = .02, F(3,54) = 13.25, p = .16$) in predicting post-intervention HPLP-IR scores. Additionally, when adding the post maladaptive coping score into the equation, no significance was discovered ($R^2 = .44, \Delta R^2 = .02, F(4,53) = 10.61, p = .16$). Furthermore, when the adaptive pre-intervention score was included into the equation, again, no significance was discovered ($R^2 = .42, \Delta R^2 = .00, F(5,52) = 8.42, p = .61$). With this model, the standard coefficients for adaptive coping pre-intervention scores, as well as both pre and post-intervention maladaptive coping scores were not statistically significant, and as previously stated, the change in R^2 for the post adaptive coping score indicates that the initial significant finding should be addressed with care. However, the standardized coefficient for the post-intervention adaptive coping score did achieve statistical significance ($\beta_{\text{adaptive cope post}} = .41$). This positive statistically significant coefficient suggests that as adaptive coping strategies increase, so do interpersonal relations. The results are presented in Table 10.

Table 10: Variables for Standardized (β) and Nonstandardized (b) Beta Values for Regression Model Using HPLP-IR Post as Criterion.

Variable	β	b	t value	p value
**HPLP-IR Pre	.49	.43	3.72	<.01
*Adapt Cope Post	.41	.02	2.86	<.05

*Indicates an F-test significant at the 0.05 level **Indicates an F-test significant at the 0.01 level.

This second hierarchical regression analysis examined the predictive relationship between coping strategies and nutrition health behaviors as measured by the HPLP-NU subscale. The preliminary step in this hierarchical regression analysis evaluated the degree of significance the HPLP-NU (nutrition) subscale pre-intervention score predicted the criterion of the HPLP-NU (nutrition) post test score. This model was statistically significant $R^2 = .31$, $F(1,56) = 25.83$, $p < .01$. Next, the predictor of post adaptive coping scores was introduced into the model. However, this step in the hierarchical regression analysis did not exhibit statistical significance in predicting post intervention HPLP-NU scores $R^2 = .32$, $\Delta R^2 = .00$, $F(2,55) = 13.08$, $p = .46$. Following this, the predictor of pre-intervention adaptive coping scores was introduced into the model, which initially displayed statistical significance in predicting post intervention HPLP-NU scores $R^2 = .39$, $\Delta R^2 = .07$, $F(3,54) = 11.77$, $p < .05$. However, the change in R^2 only exhibited a marginal adjustment in value. Afterwards, the post test maladaptive coping score was added to the model. This model did not achieve statistical significance $R^2 = .43$, $\Delta R^2 = .03$, $F(4,53) = 10.04$, $p = .07$ in predicting post-intervention HPLP-NU scores. Additionally, when introduced into the equation, the pre-test maladaptive coping score did not display statistical significance $R^2 = .43$, $\Delta R^2 = .00$, $F(5,52) = 7.90$, $p = .85$.

The standard coefficients for both pre and post-intervention maladaptive coping scores were not statistically significant. However, the standardized coefficient for the pre-intervention adaptive coping scores was statistically significant ($\beta_{\text{adaptive cope pre}} = .30$). The positive direction of the standardized coefficient of pre-intervention adaptive coping indicates that the higher one encompasses adaptive coping strategies, the greater they are to adopt nutritionally sound health behaviors. The results are presented in Table 11.

Table 11: Variables for Standardized (β) and Unstandardized (b) Beta Values for Regression Model Using HPLP NU Post as Criterion.

Variable	β	b	t value	p value
**HPLP-NU Pre	.55	.52	5.13	<.01
*Adapt Cope Pre	.30	.01	2.33	<.05

*Indicates an F-test significant at the 0.05 level **Indicates an F-test significant at the 0.01 level

This third hierarchical regression analysis examined the predictive relationship between coping strategies and health responsibilities as measured by the HPLP-HR subscale. The first step in this regression analysis examined the predictive relationship of the HPLP-HR (health responsibility) subscale pre-intervention score upon the criterion of the post test score of the same subscale. This model was statistically significant $R^2 = .47$, $F(1,56) = 49.98$, $p < .01$. Subsequently, I was interested in determining the predictive relationship between the post test adaptive score and the criterion of the post intervention HPLP-HR subscale score. Therefore, the post-intervention adaptive score was introduced into the hierarchical model. However, statistical significance was not achieved ($R^2 = .47$, $\Delta R^2 = .00$, $F(2,55) = 25.26$, $p = .38$). Following this analysis, the pre-intervention adaptive coping score was added to the model, however, it failed to achieve statistical significance ($R^2 = .51$, $\Delta R^2 = .03$, $F(3,54) = 19.00$, $p = .06$). Additionally, when the post

test maladaptive coping score was added to the model, it failed to achieve statistical significance ($R^2 = .51$, $\Delta R^2 = .00$, $F(4,53) = 14.27$, $p = .46$) in predicting post-intervention HPLP-HR scores. Not surprisingly, when the maladaptive pre-intervention scores were added, no statistical significance was obtained in predicting the criterion of health responsibility post intervention scores ($R^2 = .52$, $\Delta R^2 = .00$, $F(5, 52) = 11.25$, $p = .73$). In this model, with the exception of the predictor of pre-intervention HPLP-HR subscale scores, none of the standard coefficients for the other predictors were statistically significant. Significant findings are presented in Table 12.

Table 12: Significant Variables for Standardized (β) and Unstandardized (b) Beta Values for Regression Model Using HPLP HR Post as Criterion.

Variable	β	b	t value	p value
**HPLP-HR Pre	.70	.76	6.59	<.01

**Indicates an F-test significant at the 0.01 level

Lastly, the fourth hierarchical regression analysis examined the predictive relationship between coping strategies and physical activity as measured by the HPLP-PA subscale. The first step in this fourth hierarchical regression analysis assessed the degree of predictability the HPLP-PA (physical activity) subscale pre-intervention score possessed against the criterion of the post test HPLP-PA (physical activity) subscale score. This model was statistically significant $R^2 = .49$, $F(1,56) = 54.28$, $p < .01$. Next, the predictor of post-intervention adaptive coping was introduced into the model. However, this model failed to exhibit statistical significance in predicting post intervention HPLP-PA scores $R^2 = .49$, $\Delta R^2 = .00$, $F(2,55) = 26.74$, $p = .76$. Similarly, when adding the pre-intervention adaptive coping score into the model, statistical

significance was not found ($R^2 = .52, \Delta R^2 = .03, F(3,54) = 20.01, p = .06$). Furthermore, when additional regressions were run, no statistically significant predictors were discovered (pre-intervention maladaptive coping score: $R^2 = .53, \Delta R^2 = .00, F(4,53) = 14.96, p = .51$; post-intervention maladaptive coping score: ($R^2 = .53, \Delta R^2 = .00, F(5,52) = 11.74, p = .96$). None of the standard coefficients in this model achieved statistical significance other than the pre-intervention HPLP-PA subscale score, indicating adaptive and maladaptive coping strategies do not predict physical activity with regards to health behavior. Significant results are presented in Table 13.

Table 13: Variables for Standardized (β) and Nonstandardized (b) Beta Values for Regression Model Using HPLP PA Post as Criterion Variable

Variable	β	b	t value	p value
*HPLP-PA Pre	.72	.70	7.52	<.01

*Indicates an F-test significant at the 0.05 level

Research Question 4:

Is there a relationship between coping strategies and significant changes in blood pressure after exposure to the DIGMA program?

Hypothesis 4:

It was posited that coping strategies will significantly predict blood pressure changes after completing the DIGMA program. Similarly to the previous question, I was interested in determining which manner of coping strategy would significantly predict changes in blood pressure. As before, in order to better understand this relationship, coping strategies as measured by the Brief Cope were divided into two subscales consisting of adaptive and maladaptive coping strategies. In addition, I wanted to determine if differences in time (pre and post DIGMA intervention) had any bearing on

this predictive relationship. Therefore, these respective adaptive and maladaptive coping strategies were further separated into pre and post intervention measurements. In order to test this hypothesis, a total of two hierarchical regression analyses were conducted to determine whether coping strategies (as measured by the adaptive and maladaptive subscales of the Brief Cope), significantly predicted the criteria of changes in systolic and diastolic blood pressure. Adaptive and maladaptive pre and post-intervention coping strategies as well as the pre-intervention systolic and diastolic measurements were used to predict the criterion variable of each of the respective post-intervention systolic and diastolic blood pressure measurements. The following is a detailed description of the two regression analyses conducted. Each of the two hierarchical regressions was comprised of five steps.

This first hierarchical regression analysis examined the predictive relationship between coping strategies and systolic blood pressure. The first predictor entered into the hierarchical regression analysis assessed the degree of significance the pre-intervention systolic blood pressure reading predicted the criterion of the post-intervention systolic measurement. This model was statistically significant $R^2 = .16$, $F(1,56) = 10.97$, $p < .01$. Following this, the post adaptive coping strategy score was added into the model. However, with this variable added, the model failed to predict the criterion ($R^2 = .20$, $\Delta R^2 = .03$, $F(2,55) = 6.88$, $p = .11$). Although not statistically significant, it is important to note that the addition of this variable into the equation illustrates a marginally significant trend. Adaptive pre-intervention scores were subsequently added into this regression analysis, although the results failed to establish a statistically significant predictor of the

criterion ($R^2 = .21$, $\Delta R^2 = .00$, $F(3,54) = 4.91$, $p = .32$). Additionally, when the maladaptive pre-intervention scores were included into the model, no statistically significant predictor was discovered ($R^2 = .21$, $\Delta R^2 = .01$, $F(4,53) = 3.70$, $p = .61$). Finally, when the post-intervention maladaptive coping scores were subsequently added into the model no statistically significant predictor was discovered ($R^2 = .24$, $\Delta R^2 = .03$, $F(5,52) = 3.44$, $p = .15$). With this model, the standardized coefficients for adaptive coping pre-intervention scores, and both pre and post-intervention maladaptive coping scores were not statistically significant. Although the full model did not achieve significance, the standardized coefficient for the post-intervention adaptive coping score approached statistical significance ($\beta_{\text{adaptive cope post}} = -.32$). Due to the negative direction of this standardized weight, this trend suggests that as adaptive coping increases, systolic blood pressure decreases.

Table 14: Variables for Standardized (β) and Unstandardized (b) Beta Values for Regression Model Using Systolic Post BP as Criterion.

Variable	β	b	t value	p value
*Systolic Pre	.42	.53	3.45	<.01
Adapt Cope Post	-.32	-.59	-2.07	.11

*Indicates an F-test significant at the 0.05 level

This second hierarchical regression analysis examined the predictive relationship between coping strategies and diastolic blood pressure. The first step in this hierarchical regression analysis examined whether pre-intervention diastolic blood pressure readings predicted the criterion of the post-intervention diastolic measurement. This model was statistically significant $R^2 = .39$, $F(1,56) = 35.82$, $p < .01$. However, the pre-intervention diastolic blood pressure reading accounted for the majority of the variance and the other

predictors did not achieve statistical significance (adaptive post-intervention added: $R^2 = .40$, $\Delta R^2 = .01$, $F(2,55) = 18.42$, $p = .31$, adaptive pre-intervention added: $R^2 = .42$, $\Delta R^2 = .02$, $F(3,54) = 13.48$, $p = .11$; maladaptive post-intervention added: $R^2 = .45$, $\Delta R^2 = .03$, $F(4,53) = 11.24$, $p = .08$; maladaptive pre-intervention added: $R^2 = .45$, $\Delta R^2 = .00$, $F(5,52) = 8.82$, $p = .95$). Moreover, none of the standardized coefficients were statistically significant. The significant results for both of these analyses are found in Table 15.

Table 15: Variables for Standardized (β) and Nonstandardized (b) Beta Values for Regression Model Using Diastolic Post BP as Criterion.

Variable	β	b	t value	p value
**Diastolic Pre	.60	.70	5.92	<.01

**Indicates an F-test significant at the 0.01 level

Research Question 5:

Do differences in perceptions of stress impact the possibility of adopting new health promoting behaviors?

Hypothesis 5:

This hypothesis stated that in embracing new health behaviors, there would be significant differences among persons who report elevated perceptions of stress than those who do not. Individuals who do not report elevated perceptions of stress are more proficient at adopting new health behaviors than persons who express higher levels of perceived stress.

An initial repeated measures analysis of variance was conducted to examine pre and post-intervention mean differences with regards to perceptions of stress (as measured by the Perceived Stress Scale). Because statistical significance was not achieved with

this initial analysis, ($F(1,57) = 1.98, p=.16$) further analyses were not conducted. Group means, standard deviations and results of the univariate F-tests are presented in Tables 16 and 17, respectively.

Table 16: Blood pressure measurement. Means and Standard Deviations

Variable	N	M	SD
PSS Pre	58	35.40	9.03
PSS Post	58	34.20	8.45

Table 17: Univariate F-Tests: Hypothesis 1a.

Variable	Hypo SS	Error SS	Hypo MS	Error MS	F	Sig. of Effect F	Size η^2
PSS Pre-Post	39.27	1127.34	39.27	19.77	1.98	.16	.03

EXPLORATORY ANALYSES

This section considers at greater length some significant findings ascertained through investigation of the research questions. The first component of this exploratory examination investigates certain demographic variables of interest and their impact on changes in blood pressure and health behaviors. The second element of this section focuses on more in depth analyses of previous significant findings discovered when examining health promoting behavior. Lastly, a more thorough investigation upon the predictive relationship between adaptive coping strategies and the criterion of systolic blood pressure is conducted.

At the onset of all prior analyses, repeated measures of analyses of variance were conducted to assess if any demographic information accounted for statistical significance

among changes in blood pressure and health behaviors. The majority of the demographic variables did not account any statistical significance. However, certain noteworthy findings do exist. The variable labeled 'current exercise status' initially appeared to account for a statistical amount of variability in diastolic blood pressure changes ($F(4, 63) = 2.65, p < .05$). Furthermore, the variable assessing one's history of exercise initially accounted for statistical significance among diastolic blood pressure changes ($F(4, 65) = 2.56, p < .05$). Upon this discovery further exploration was warranted. In particular, it was decided to examine whether the status of current levels of exercise and history of exercise significantly predicted changes in diastolic blood pressure. Therefore, a series of simple regression analyses were performed in order to test the predictability of this relationship.

As expected, when controlling for pre-intervention diastolic blood pressure, current exercise continued to account for statistical significance ($R^2 = .46, F(2, 65) = 28.14, p < .01$). The direction of the standard coefficient ($\beta_{\text{current exercise}} = -.25$) displayed an inverse relationship with diastolic blood pressure, indicating the more one currently exercises, the lower one's diastolic blood pressure is. Similarly, the second regression analysis produced significant results, ($R^2 = .41, F(2, 67) = 23.30, p < .01$) showing that the variable of exercise history ($\beta_{\text{history of exercise}} = -.23$) was inversely related to diastolic blood pressure changes. In both cases, the reverse standard coefficient suggests that as exercise prevalence increases, diastolic blood pressure decreases.

The demographic variable of one's current level of depression warranted additional exploration with regards to promotion of health behaviors. Preliminary analyses detected that this variable accounted for statistically significant variance ($F(1, 56) = 4.46, p < .05$) among the HPLP-II HR subscale (health responsibility). A regression analysis was conducted to determine the amount of predictability the demographic variable 'level of depression' accounted for with the criterion of health responsibility. However, this analysis did not reveal a significant predictive relationship between these two variables ($\beta_{\text{history of exercise}} = .16; p = .10$).

The final demographic variable of interest warranting further exploration was level of sleep and its impact upon the health responsibility subscale of the health promotion (HPLP-II HR). Initial analysis indicated that level of sleep accounted for a significant portion of variance of one's health responsibility ($F(1, 53) = 2.64, p < .05$). A regression analysis further revealed a significant inverse relationship between these two variables ($\beta_{\text{sleep}} = -.26; p < .01$). Due to the nature of how sleep was coded into the questionnaire, higher levels of this variable indicated decreasing hours of sleep. This indicates the more a person sleeps, the more apt they are in adopting responsible health behaviors.

With regards to health behaviors, preliminary findings displayed statistically significant predictive relationships between adaptive coping strategies (as measured by the Brief Cope) and the criteria of interpersonal relations and nutrition health promotions (as measured by the HPLP-II IR and HPLP-NU subscales, respectively). Therefore, it was decided to explore the manner in which particular factors of adaptive coping

strategies would predict both of the criteria in question. It was posited that certain adaptive coping strategies (as measured by Brief Coping subscales assessing this mode of strategy) would predict health behavior changes more significantly than other adaptive coping strategies.

In order to further explore this, a simultaneous regression analysis was carried out. This regression model examined the predictive relationship of all eight subscales of the adaptive coping component of the Brief Coping upon the criterion of the post test HPLP-IR subscale score. After controlling for the pre-intervention measure of this subscale, all eight post-intervention subscales of adaptive coping strategies were simultaneously entered into the regression model. This regression model displayed significance; however, the majority of the predictability was accounted for by the pre-intervention measure of the criterion. Thus, no significant predictive relationship was achieved among the subscale factors of adaptive coping strategies. The results for this analysis are presented in Table 18.

Table 18: Variables for Standardized (β) and Nonstandardized (b) Beta Values for Regression Model Using HPLP IR-Post as Criterion.

Variable	β	b	t value	p value
**HPLP-IR Pre	.47	.41	3.83	.00
Active Post	.07	.02	.50	.61
Planning Post	.06	.02	.31	.75
Pos. Reframing Post	-.11	-.32	-.72	.47
Acceptance Post	-.08	-.28	-.65	.51
Humor Post	.02	.00	.17	.86
Religion Post	.06	.01	.50	.61
Emo. Support Post	.01	.00	.10	.91
Instru. Support Post	.27	.08	1.61	.11

**Indicates an F-test significant at the 0.01 level

Prior initial analysis of adaptive coping strategies revealed a statistically significant predictive relationship upon the nutrition variable of health promotions (as measured by the HPLP-II NU). An exploratory analysis was therefore initiated to determine the predictive quality of the eight adaptive coping subscales upon increased nutrition practices. After controlling for the pre-intervention measure of this subscale, all eight pre-intervention subscales of adaptive coping were entered into the regression model. Similar to the previous analysis, there was not a significant predictive relationship.

The findings of both of these analyses may be due to the possibility that the aggregate quality of this style of coping rather than individual sub traits account for the predictive attribute of these two types of health promotions. Alternatively, it is important to consider that due to the small sample size, it is perhaps not feasible to find a statistically predictive relationship with this manner of analysis. The results for this analysis are presented in Table 19.

Table 19: Variables for Standardized (β) and Unstandardized (b) Beta Values for Regression Model Using HPLP NU Post as Criterion.

Variable	β	b	t value	p value
*HPLP-NU Pre	.52	.49	4.41	.00
Active Pre	.23	-.08	1.49	.14
Planning Pre	-.26	.09	-1.25	.21
Pos. Reframing Pre	.05	.01	.31	.75
Acceptance Pre	-.07	-.02	-.48	.62
Humor Pre	.10	.02	.67	.50
Religion Pre	.15	.03	1.13	.26
Emo. Support Pre	-.13	-.04	-.76	.44
Instru. Support Pre	.13	.04	.73	.46

*Indicates an F-test significant at the 0.05 level

In regards to the association between coping strategies and blood pressure, preliminary analyses did not discover a statistically significant predictive relationship. However, when the full regression model was analyzed, the standardized coefficient of the post-intervention adaptive coping score displayed a significant weight. Although not displaying overall significance, a simultaneous regression analysis further explored the trend with this relationship. After controlling for the pre-intervention systolic blood pressure readings, the eight subscales subsumed under the factor of adaptive coping were entered into the equation. Results indicate that the subscale of religion is statistically significant in predicting a change in systolic blood pressure. The reverse direction of the standardized coefficient indicates the lower one measures on systolic blood pressure, the greater they measure with regards to the adaptive coping strategy of religion ($\beta_{\text{religion post}} = -.31; p < .05$). Initial analyses did not achieve a statistically significant predictive relationship among changes in systolic blood pressure and coping strategies. However, the standardized coefficient of the post-intervention adaptive coping score displayed a significant weight, indicating the subscale of religion displayed noteworthy predictability among the change in systolic blood pressure. Refer to Table 20 for a list of these results.

Table 20: Variables for Standardized (β) and Unstandardized (b) Beta Values for Regression Model Using SYS BP Post as Criterion.

Variable	β	b	t value	p value
*Systolic BP Pre	.47	.60	3.64	.00
Active Post	.04	.52	.25	.79
Planning Post	-.11	-1.46	.52	.61
Pos. Reframing Post	-.13	-1.38	.76	.44
Acceptance Post	.00	-.005	-.003	.99
Humor Post	.19	1.64	1.24	.21
*Religion Post	-.31	-2.71	-2.14	.03
Emo. Support Post	-.04	-.48	-.23	.81
Instru. Support Post	.12	1.28	.63	.52

*Indicates an F-test significant at the 0.05 level.

Qualitative Data

One week after the final meeting, telephone interviews were conducted to identify experiences of the DIGMA participants as well as their thoughts regarding specific program components which played a role in any behavior changes. The questions asked were intended to informally gauge where our subjects existed on the stages of change continuum (Prochaska & Norcross, 2001) as well as their stated beliefs about coping strategies and perceptions of stress. The intent of collecting this qualitative data is to understand and evaluate participants' personal experiences with the DIGMA program. Persons who took part in the qualitative interviews were individuals who completed all aspects of the DIGMA program as well as completing both pre and post intervention measures. In addition, qualitative information was collected from individuals who dropped out. Program dropouts included any individuals who originally consented to participate, but were not able to complete the study by attending all 4 meetings and completing both pre and post intervention measures. Some dropouts left the program after the first week while others only missed the final session. A semi-structured interview format helped to reveal cognitive changes that may have stemmed from program participation.

Out of the 71 participants who originally consented to participate in the DIGMA program, 58 completed all sessions whereas 13 did not. A random sample of 30 participants who completed the program was contacted to gather this information. In addition, a random sample of 7 individuals who failed to attend all DIGMA meetings was

contacted. Responses have been evaluated for thematic content and informal results are presented below.

Qualitative Results

Question 1:

Thinking back over the past month, please talk about any changes you have made to your routine.

Probe: This might include eating habits, exercise, or dealing with stress.

This question elicited general changes made over the period of time that the participant was involved in the DIGMA. Changes made along some of these dimensions include: increase awareness regarding coping better with stress; improve diet, reduce salt and fat intake and high cholesterol foods; lose weight; increase exercise; increased medication compliance; increased reliance on family for support; keeping tabs on feelings of anger.

The general pattern of responses brings to light the overall trend towards making significant changes to their routine since attending the DIGMA program. For example, one individual stated “My awareness is much better; I eat more fruits, less salt and look more at labels. Also, regarding stress, I am able to see ways to “blow it off” and see things in perspective”. Similarly, the majority of respondents communicate parallel experiences, as evidenced with “I’ve begun to moderate my diet, such as lowering my cholesterol ex: bacon intake, my sweets intake. And I’ve increased my fruits and veggies,

as well as exercise. Also, I'm cooking more sensibly too. I have a goal in mind to reach my ideal weight".

Question 2:

What do you feel that you can attribute these changes to, if any?

Attributable factors to these changes include: the DIGMA; reminders from the group of what to do to take care of myself; desire to change; awareness; feeling tired of being sick and having an unhealthy lifestyle; shared experience; prolonged future; motivated by the group and the group facilitators.

By and large, the responses gathered reflect these themes and reveal that the majority of respondents attribute changes to their routine to participation in the DIGMA program. For example, participant statements such as "the group gave me more incentives to focus on how I was dealing with it (stress)" and "I've wanted to make these changes for my health, however, the topics discussed in the groups really helped motivate me"; embodied the overall theme of the responses received.

Question 3:

How have your feelings of stress in relation to your health concerns changed, if at all?

Probe: Discuss any changes to stress levels in the way you think about your healthcare provider.

Changes made towards feelings of stress concerning health issues include: increased self-reliance; decreased reliance upon medical staff; collaboration with medical staff; increased comfort with medical staff. The majority of responses emulate the greatest part of the themes discovered. For example, "I feel better, I can talk with my Dr.

about anything” and “I feel like I can state what I need”. Furthermore, many responses demonstrate the numerous significant changes participants experienced concerning feelings of stress in relation to their health concerns since attending the DIGMA program, such as “The class has helped a lot in getting me to ask questions” and “Since attending the group, I feel more able to discuss problems with my doctor”.

Question 4:

Have you noticed any changes in the way you deal with stress in relation to your health problems? This might include changing your activities or diet as well as seeking help from professionals.

Probe: Is this a change for you over the past month?

The majority of respondents indicated that changes had occurred since attending the DIGMA program. For example, one participant stated “I ask more questions. Also, I watch myself when I stir myself up to keep my BP down. Over past month I’ve become more aware of it”. Another individual disclosed “I’ve been more proactive about making appointments when needed- and the group helped me with this. These changes have been since the class. Also, all three things, especially nutrition, medication compliance and stress levels have changed”. Similarly, numerous respondents mirrored what these individuals shared.

Question 5:

What was your experience of the DIGMA program?

The majority of respondents revealed that they really enjoyed the DIGMA program. Themes from responses to this question were: Very good; enjoyed information

from the pharmacist; enjoyed checking blood pressure regularly; enjoyed listening to others; would like a similar program dedicated to diabetes; enjoyed the handouts; some people talk to much. The following quote characterizes the majority of the responses: “Very impressed with the VA and things that they do. Previously, I didn’t have a good opinion about the VA, but now, based on this program I feel cared for”. Additionally, the overall trend of responses reflects the positive attitude towards the group interaction, such as “My experience was good. I especially liked hearing stories from others, like people who are older, and get info from them on how to live longer. Also, listening to others, the group format was great!”; “ It helped me remember things that I forgot; I thought it was very informative and I thought I knew all about high BP, but I learned more new things”; and “I enjoyed being in the group, especially learning from each other and listening-picking up pointers from others”.

Probe A: In your recollection, what were the most positive aspects of the program like?

Participant responses reveal numerous themes uncovered, including: ability to talk to physician; learning about dietary guidelines and exercise; encouraging patients to explore what it takes to make changes; hearing other members talk about shared problems; receiving lots of information; information about various medications; meeting new people; and discussing ways to handle stress. The following quotes spotlight the majority of what the participants experienced “Dr. participation was great- it showed that they were interested in us”; “The direct access to healthcare providers was excellent! Also, able to see different perspectives- more viewpoints from the other professions” and

“Everything was positive, especially the professional involvement and the care for the well being of the patients”.

Probe B: What were some of its shortcomings? Or what could be added to improve the program?

Based on the overall pattern of responses from this question, participants were forthcoming with numerous suggestions to help improve the DIGMA program. Themes from responses to this probe included: more information on exercise; more dialog with physicians; some initial confusion regarding purpose of the meetings; would like more handouts; more time with a pharmacist; more continuance with an ongoing program; and would like more interaction between members. The following responses parallel the key topics expressed: “It would be good to add more physicians, add different speakers to mix it up”; “We need more interactions with the doctors, Q&A with them would be nice” and “3 weeks instead of 4 weeks and also a one month continuing program for graduates- for each co-hort so we can continue with life-changes, because its dynamic and cohesive and we should continue it.... More group therapy sessions would be helpful also”.

Question 6:

What was your initial reaction when you first learned about this health program?

Themes from responses to this question were: I didn’t want to come; unsure about what it would be like; and interested/curious. The following responses highlight the overall initial reactions to first learning about the DIGMA program: One individual shared that “I had some reservations about it being about psychology”, typifying many

others' initial thoughts. One person shared that "Initially, I was not going to go, but I really enjoyed it!" while another stated that "I thought it was going to be a waste of time, but now, I know it wasn't & I would do it again. I would also recommend it to others".

Question 7:

Thinking back over the past month, how ready were you to make changes to your health status?

Themes from responses to this question were: not ready; somewhat ready, very ready. When asked, many respondents shared that they were ready to make some changes to their health status. However, there were some individuals who were not willing to adopt health behavior changes. For example, one individual stated "Other than my dietary changes, I'm not really sure at this point, especially with all of the personal stuff going on right now". Nevertheless, the majority of participants interviewed stated a desire to make some changes. Responses reflecting these desires include "I'm very ready. I'm doing it and I want to live longer", "It is very high- it would be an eight on a scale from one to ten". Furthermore, some respondents underline the general impetus towards generating change to their health status came from the group experience. "I wasn't ready before-no one has spent the time to tell me this is what you need to do....this gave me more incentive to make changes" and "The DIGMA helped with my willingness".

Qualitative Results – Dropouts

The follow-up interview for this subgroup was based upon that of the graduates with the addition of two questions.

Additional Question 1:

Our records indicate that you did not complete all three sessions of the DIGMA program. Please let me know what happened that prohibited you from attending.

This question was intended to establish whether the program or personal reasons influenced the individual to not attend. The main themes from this question included: personal problems; family emergency; illness; conflicted with work schedule. The majority of responses point to time constraints and illness as the main factors that kept them from attending “I felt very bad and I couldn’t get out of the house” and “I was not feeling good that morning so I cancelled”.

Probe: Did the DIGMA not appear to meet your needs?

Rather than inappropriateness of the program, the majority of respondents indicated that time constraints was the biggest factor in not attending. For example, one individual stated “I would recommend it to others, but it was difficult for me to get there because of work”.

Additional Question 2:

Would you be willing to reenroll?

Themes from this question were: Yes; No, because of distance; Conflict with schedule; Maybe if it were offered at a different time. These themes are mirrored in the responses. “Yes- I would. My biggest problem is scheduling it around my job- because I

work in the daytime”; “No, drive is too long”; “ I may want to go back if it were on another day”; “If I could get a ride down to the clinic”.

Chapter 5: Discussion

The present study explored whether individuals who participated in a Doctor Interactive Group Medical Appointment (DIGMA) expressed significant changes in systolic and diastolic blood pressure, health behaviors and perceived stress. This study investigated whether the psychological variable of coping strategies significantly predicted the physiological variables of blood pressure changes, as well as the physiological health behavior constructs of nutrition, physical activity and the psychological health behavior construct of interpersonal relations. Finally, the ability of various indices of coping strategies to predict changes in blood pressure and health behaviors were investigated. This chapter is organized into four sections. The first section of this chapter presents a summary and discussion of the results of the study; the second section investigates the possible limitations of the study; the third focuses on suggestions for future research; and the concluding section concentrates on the implications of the study for counseling psychology.

SUMMARY AND DISCUSSION OF RESULTS

Significant blood pressure differences among DIGMA participants

There were significant differences between pre and post intervention readings of both systolic and diastolic blood pressure among participants who completed the DIGMA program. There was an average of a twenty point decrease in systolic blood pressure and a ten point decrease in diastolic pressure. These findings parallel previous hypertension research findings. For example, in a study assessing medication adherence, Collins et al (1990) conducted a meta-analysis of 14 randomized control trials of antihypertensive medication regimens and determined that among the 37,000 participants who were on medication, there was a 6mm Hg decrease in diastolic blood pressure. Furthermore, in a study evaluating medication efficacy, Staessen et al (1997) determined that among 4695 hypertensive individuals who underwent medication treatment, there was an average of 23 mm Hg drop in their systolic readings and a 7mm Hg drop in their diastolic readings. In a study assessing the effects of healthy nutrition changes among 459 participants, Appel et al (1997) found that hypertensive individuals who adopted a diet rich in fruits, vegetables and low-fat foods reduced their blood systolic and diastolic pressure readings by 11.4 mm Hg and 5.5 mm Hg respectively. Hagberg, Park and Brown (2000) assert exercise training can have an average of 11 mm Hg decreases in systolic blood pressure and 8 mm Hg decreases in diastolic blood pressure among hypertensive individuals. Among stress reduction treatments such as cognitive restructuring behavioral interventions, blood pressure decreases averaged 15mm Hg and 9 mm Hg for systolic and diastolic readings, respectively (Linden & Chambers, 1994).

The DIGMA program integrated many characteristics of these previous studies. The significant blood pressure decreases among participants suggest programs such as the DIGMA are an integral factor in achieving better control of hypertension. Interviews gathered from individuals after participation attest to this. For example, many individuals shared their experiences in the program helped take better care of themselves, thus translating into decreases in hypertension. *“I’m trying not to let family problems get to me as before. I’m taking more walks with my wife. I am watching my salt in my food more closely”*.

Significant blood pressure differences among program graduates v. dropouts

Both systolic and diastolic blood pressure pre and post intervention readings among those who completed their participation in the DIGMA program were statistically significant. Among those who did not complete the DIGMA program, there were significant pre and post intervention differences among systolic blood pressure readings; however, diastolic blood pressure did not exhibit significant differences between the two measurements. With this group, post-intervention blood pressure readings were measured at the end of the same time period that would have been followed if participants would have completed the group. Additionally, individuals who completed the program (graduates) exhibited over 20 mm Hg decrease in systolic blood pressure and 10 mm Hg decrease in diastolic blood pressure. Individuals who did not complete the DIGMA program displayed a 13 mm Hg drop in systolic blood pressure differences among program graduates showed 3.5 mm Hg drop in diastolic blood pressure. This shows a 7

point mm Hg difference in both systolic and diastolic blood pressures between DIGMA program graduates and dropouts. It is important to note that although the blood pressure measurements suggest noteworthy differences, they are not statistically significantly different from each other. However, this may be due to the small sample size studied. Nevertheless, there are wide-ranging implications for the noteworthy findings between pre and post intervention systolic and diastolic blood pressure measures. Staessen et al (1997) illustrated that hypertensive individuals undergoing pharmacological treatment to decrease high blood pressure yielded an average reduction in systolic and diastolic blood pressure of 23 and 7 mm Hg respectively. Furthermore, it is important to note that all participants in the DIGMA study are also undergoing pharmacological treatment for hypertension. So much so, that many participants have been utilizing this treatment option for decades. Thus, DIGMA participation may be linked with additional systolic and diastolic blood pressure decreases in addition to that achieved by pharmacological means. Moreover, the cognitive-behavioral aspects of the DIGMA program may function as a successful catalyst for those who have been unsuccessful in controlling their high blood pressure. This suggestion is in line with the World Health Organization's recommendations to increase partnership and pro-activity among healthcare seekers (Epping –Jordan, 2005). Responses collected at the end of the program indicate participants' satisfaction with this approach. *“Being in the class made me realize that it (health) is very important”*.

Poorly controlled hypertension was a principal factor in the DIGMA program referral and recruitment process. Individuals self-selected participation with the

intention of determining if they needed further support with hypertension management. One of the most significant reasons for individuals declining participation in the program was self reports of their hypertension being under control.

Significant health behavior changes among DIGMA participants

Findings on all subscales of the HPLP-II from pre to post intervention generated promising results. Significant increases in health promoting behavior were discovered in the areas of interpersonal relations, nutrition, health responsibility, and physical activity. These findings suggest DIGMA participation was an essential element between receiving information and actually progressing towards implementing positive health behaviors, as most participants were previously aware of the recommended lifestyle modifications discussed in the DIGMA program. For example, the significant finding in the interpersonal relations subscale of the HPLP-II may speak to the value of the group modality as individuals developed more comfort with and acceptance by peers as the program progressed. Responses from participants further support this: “*(The) general acceptance from others in the group was great!*”, and “*The ability to speak freely in a group atmosphere was amazing!*”. Moreover, the significant increases in scores measuring health responsibility, physical activity and nutrition attest to awareness building surrounding these areas. These results follow recommendations for health promoting programs to integrate self management and self empowerment (Anderson et al 2000).

Coping strategies as predictor of health behavior changes

Significant findings from the comparison of post intervention levels of adaptive coping strategies with the criterion of HPLP-II Interpersonal Relations (IR) display intriguing results. The change from pre to post intervention maladaptive coping strategies did not achieve statistical significance. However, the change from pre to post intervention adaptive coping scores showed statistical significance, detecting the possibility of building awareness through DIGMA program participation as a factor in modification of health behaviors. Participant responses further indicate this finding: *“Awareness is better, especially coping with stress”, and “I’m trying not to let family problems get to me as before. I’m taking more walks with my wife”.*

The comparison of pre and post intervention levels of coping strategies with the criterion of HPLP-II Nutrition (NU) demonstrated interesting outcomes. The non-statistical findings of both pre and post intervention maladaptive coping strategies illustrate that these types of strategies have no bearing upon adoption of beneficial dietary practices. This suggests that other factors such as program participation influence participants’ adoption of nutrition behaviors. Conversely, significant findings of adaptive coping strategies as predictors of nutrition demonstrate that adaptive coping strategies help to shape adoption of healthy nutrition practices.

Other non-significant findings from the comparison of HPLP-II HR and PA subscales change scores with pre and post intervention levels of coping strategies indicate that coping strategies do not predict the criterion of changes in health behaviors with regards to health responsibility and physical activity. Rather, the DIGMA program may

have a positive effect behaviorally among participants' health behavior changes regardless of strategies of coping with stress prior to the program. While the original hypothesis was not supported, this is good news for patients in that one's coping strategies concerning stress appear to have little impact upon the results of participation in the DIGMA program upon adoption of beneficial health behaviors.

Coping strategies as predictor of blood pressure changes

Findings from the comparison of adaptive and maladaptive coping strategies with the criterion of post intervention systolic blood pressure strategies display intriguing results. Post intervention adaptive coping scores did not significantly predict changes in systolic blood pressure, suggesting this factor does not influence systolic related hypertension among program participants. This finding suggests participants' awareness development of advantageous coping strategies beneficially influences systolic hypertension. Surprisingly, maladaptive coping strategies did not significantly predict increases in systolic blood pressure, suggesting this factor does not influence systolic related hypertension among program participants.

Non-significant findings from the comparison of adaptive and maladaptive change scores with pre and post intervention levels of diastolic blood pressure indicate that coping strategies do not predict changes in diastolic blood pressure levels. Rather, the DIGMA program may have a positive effect behaviorally among participants' diastolic blood pressure changes regardless of strategy of coping with stress. While the original hypothesis regarding diastolic blood pressure change was not supported, this is

good news for individuals in that one's strategies for coping and their influence upon diastolic hypertension appear to have little bearing upon the results of participation in the DIGMA program.

These findings regarding blood pressure and coping strategies partially support the hypotheses. However, individuals reported positive interactive experiences with other group members in the DIGMA program. *"I enjoyed hearing other stories from others, like people who are older, and get information from them on how to live longer"* and *"I enjoyed listening to others. The group format was great!"*. In turn, these positive experiences may translate into alleviation of hypertension.

Perceptions of stress

Findings from the pre to post intervention perceptions of stress did not indicate any statistically significant changes with this variable, suggesting that participants did not significantly alter their perceptions of stress. Given that one of the main focuses of the DIGMA intervention was to expand awareness of stress and to provide new coping strategies for managing stress, this outcome was unexpected. However, one of the goals of this intervention was to increase awareness regarding how one deals with stress. In light of this, it is expected that, through participation, one may become more aware of what stress is and how it manifests itself. Therefore, during the period of program intervention, it is possible the perceptions of stress did not decrease, rather, the strategies of coping with it would. In other words, the amount of stress may not have changed, but

the manner in which one deals with it did. This idea is exemplified in one individual's response: "*Dealing with stress has changed for the better*".

Exploratory analyses

Other significant relationships between demographic attributes and previously discussed variables are examined. A noteworthy relationship exists between lower diastolic blood pressure levels and increased levels of exercise. In line with Hagberg et al (2000), increased exercise levels can account for significant decreases in both systolic and diastolic blood pressure. An additional significant relationship exists between the demographic variable of hours of sleep and adoption of positive health behaviors, exhibiting that the more one sleeps the more apt they are to embrace beneficial health practices.

Upon discovering initial significant predictability among the criterion of certain health behaviors, more distinct regressions were employed. These regression analyses were conducted to assess if any of the subscale variables of adaptive coping strategies acted as a significant predictor towards the criteria of interpersonal relations and nutrition. However, no statistically significant relationship was discovered among individual subscales of the adaptive coping strategies. This discovery may point to the instrument functioning to quantify coping strategies as a unified construct, or the nature of adaptive coping strategies in this study operating more successfully as an aggregate when predicting health behaviors.

Initial analyses did not achieve a statistically significant predictive relationship among changes in systolic blood pressure and coping strategies. However, the post-intervention adaptive coping score indicates the subscale of religion displayed noteworthy predictability among the change in systolic blood pressure. It is important to note the religious subscale for the Brief Coping Strategies Questionnaire is designed for a more broad interpretation of spirituality, drawing on one's individual definition of spirituality rather than one's relationship to conventional religion (Carver, 1989). The two items that comprise this subscale: "I've prayed or meditated" and "I've tried to find comfort in my religion or spiritual beliefs" elucidate this viewpoint. However, it is important to mention in a study examining religious influence upon persons encountering cardiovascular disease, positive effects of religious affiliation are substantial, with individuals who encompass existential certainty such as subscribing to organized religion report higher levels of life satisfaction, greater personal happiness, and fewer negative psychosocial consequences of traumatic life events (Ellison 1983, 1991). With these two perspectives, this finding is open to different interpretations regarding what this construct is actually measuring. When asked what could be attributed to changes in ways in which one deals with stress, one participant answered "the lord". It is possible that participants actively cope with their stress and health concerns through belief in a higher power. Furthermore, this finding could be ascribed to participants employing an active sense of spirituality as a means of relieving stress, in turn translating to decreases in hypertension.

STUDY LIMITATIONS

All of our subjects were prescribed some form of antihypertensive medication. Some who scaled abnormally high blood pressures during the intervention were administered different antihypertensive medications at varying dosages. Therefore, this may have complicated the results of the blood pressure. The ability to control for medication would be intriguing however, given the systemic constraints; this was not possible to do. A potential response to this limitation would be to control for medication type and adherence. Related to this issue is that the majority of our subjects possess comorbid physiological and mental health concerns. Based on this, separating the effects of these other conditions from a symptomatic and pharmacologic treatment perspective is challenging.

There were multiple incidents where the researchers had to remind primary care staff that the DIGMA program was taking place. Due to this, nursing staff inconsistencies as well as other systemic constraints yielded threats to interrater reliability with blood pressure readings. Related to this is the innate variability that occurs in blood pressure readings. Although blood pressure was recorded at the beginning and the end of the DIGMA program, there was no way to account for the incidence of “white coat syndrome”, a condition in which patients experience stress and thus elevate blood pressure upon interacting with healthcare providers. Therefore, it is possible that through attendance in the DIGMA, elevated blood pressures due to “white coat syndrome” was mitigated; however, it was not assessed with this study. A possible solution to this limitation would be to have individuals take self-measured ambulatory

blood pressures and then average these with blood pressure readings recorded by a provider. One possible obstacle to this technique is the lack of a standard measurement utilized by the individual.

In addition to discrepancies with primary care staff, inconsistencies with pharmacy personnel also created limitations for this study. Different pharmacists were present during the pharmacological component of the DIGMA meeting. Additionally, there were times when the pharmacists were able to attend the meetings for a very limited amount of time. This may have affected the treatment outcome of the medication adherence in an adverse manner. It is noteworthy to point out that both of these limitations stem from a system inundated with taxed resources, a factor that the DIGMA could be helpful in reducing.

A further weakness of this study concerns the challenge of measuring the DIGMA as a fixed variable. As a result of the varying factor of the participants themselves, generating the exact same environment as well as strictly covering the precise topics each month proved challenging. Despite the fact that a strong effort was made to follow guiding principles for this program, flexibility was important when subjects began to actively participate. It was common for different cohorts to focus on related but different topics that had been discussed in other groups.

Self-report inventories were utilized in this study, thus presenting another limitation. It is possible that individuals may respond or behave differently in actual situations than their answers on the inventories would indicate, thus affecting the validity of scores to predict whether or not individuals actually changed their health behaviors,

coping strategies, or perceptions of stress. After the intervention a semi structured interview was conducted to uncover participants perceptions in the program and stages of change; alternatively, a structured clinical interview with each participant, conducted by trained interviewers, could help the researchers gather more in depth information about the subjects' perceptions of stress, coping strategies and health behavior changes. Furthermore, an inventory inquiring about these factors could be given to a close family member or friend of the participant. This data could then be compared to the individual's self-report measures to evaluate the validity of their responses. Although measured qualitatively, an additional relative weakness of this study is expressed in not measuring one's stages of change from a formal quantitative perspective. Future researchers in this area should incorporate a quantitative self report measure into their study.

The participants acted as their own 'control' group, however; with no traditional control group to compare these results with, this is a limitation. Due to this limitation, generalizability of this study's findings to a larger patient population is difficult to make. Furthermore, limited resources and time proved challenging to continue the study for an additional 6 months. Excluding these restrictions, a larger sample size may have increased the power of the study, thus impacting the findings. Similarly, lack of time and resources also made a longer-term follow up impossible. It is believed that this additional information would have increased the strength of the findings.

Time constraints also limited the administration of a generalizability post intervention inventory to be given after the last meeting. Although there was at least a one week window between discussion of coping strategies, perceptions of stress and most

health behavior changes and administration, the final DIGMA component focused on the behavior of medication compliance. Given the insufficient time between intervention and measurement, it is hard to determine whether the post test readings adequately captured medication compliance. However, it is possible the qualitative data collected once a week after the final meeting offset the lack of time between intervention and post test measurement.

Because individuals self-selected participation in the group treatment approach it is assumed that these individuals would be relatively comfortable in a group setting. However, throughout recruitment some individuals were uninterested in addressing their health needs and concerns in this manner and chose not to participate. Consequently, the DIGMA may not be an effective treatment approach for everyone suffering from hypertension. Persons who struggle in social settings may encounter more anxiety and stress with this treatment approach, thereby worsening their conditions rather than improving them. Thus, feeling secure in social situations may be associated with success with programs such as the DIGMA.

Despite the fact that women make up a large amount of the veteran population, we found that the majority of our initial referrals were male. It was therefore decided that we should limit our study to men. Without accounting for the experiences of both genders, it is difficult to generalize these findings to the entire veteran population. As such, this was a significant limitation to this study.

DIRECTIONS FOR FUTURE RESEARCH

The prevalence of hypertension is related to gender, as well as ethnicity and age. In both genders, there are notable increases in prevalence of hypertension across the lifespan. Although the incidence of hypertension in young adults is greater among men than women, this difference progressively lessens with age, eventually reversing at around age 50 to a greater frequency in women than men (Burt et al., 1995). In females, a markedly significant increase in blood pressure related to age is associated with the occurrence of menopause (Staessen, Bulpitt, Fagard, Lijnen, & Amery, 1989). Thus, future research in this area should address hypertension management programs within this population.

Hypertension is also more prevalent among African Americans than Americans of other racial backgrounds, developing earlier and is associated with increased incidence of cardiovascular disease and mortality (American Medical Association, 1997; Henderson, et al, 2003). Researchers speculate that this may be due to genetic predisposition, disparities in socioeconomic status and, or stress related to discrimination (2003). In light of this, race, ethnicity, culture and variables related to these constructs should be examined with future research.

A group intervention such as the DIGMA may also be useful for other chronic ailments. Future research could replicate the DIGMA program with health concerns other than hypertension such as high triglyceride levels or chronic pain. Furthermore, future researchers may want to assess efficacy of DIGMA programs that are comorbid with hypertension such as diabetes and heart disease.

There were numerous obstacles to be overcome throughout the development of the DIGMA program. One of which was deficiency of consistent referrals from primary care providers. An additional hurdle was related to ownership of the program between healthcare providers and disagreement regarding how the interface between providers and participants should take place. Recruitment and preparation for the DIGMA program demanded an overwhelming amount of time and effort on the part of the researchers. As a result, organizations that desire to implement programs such as the DIGMA will need to allocate adequate funding for long term implementation. Although not formally investigated at this time, the recruitment process undertaken for this study was greatly contingent upon interest from primary care. Without the participation of primary care, this study would not have transpired. There were a couple of primary care providers who were consistent with participation through referrals. However, primary care buy in was not comprehensive and actually at times was tenuous. With more inclusive primary care acceptance and participation, the recruitment process would have been less demanding. Therefore, future research should continue to examine programs such as the DIGMA in order to continue to foster integration of healthcare, and the numerous systemic hurdles which impede this integration.

With additional empirical data to support the benefits of integrated care, further subscribing to this treatment modality would occur. Thus, future research related to integration of healthcare outside of the VA system. The VA system has pioneered research related to innovative approaches in providing healthcare (Yu et al, 2003). In order for integrated health programs to exist more extensively, replicating programs such

as the DIGMA should occur in other healthcare systems. Other systems at the forefront of integration of behavioral health with medicine include Kaiser-Permanente in California, and Cherokee Healthcare Systems in Tennessee. Both of these organizations have implemented integrative approaches to providing healthcare and are active in developing research which promotes this type of care (Parks, Pollack, Bartells & Mauer, 2005).

Due to the nature of monthly and sometimes weekly changing cohorts, group dynamics certainly apply in a DIGMA. Diverse personalities can create a new experience from week to week. Consequently, no single DIGMA will look identical to another. The treatment focus and resources available in a given setting are vital to the structure a DIGMA can take. Moreover, the dynamic group character makes it difficult to measure as a stable variable. All of these aspects created challenges in researching the DIGMA program.

For the DIGMA program to achieve success, it is essential for the patient to have the willingness and a readiness to change their health behaviors. Therefore, decisions and actions must be taken on their part regarding how to change their health behaviors in order for these outcomes to occur. It is possible decreased dependence on patient pro-activity such as the traditional acute care model may show initial gains in hypertensive management. Based on the considerable increases in hypertension, it is essential to move towards implementation of programs such as the DIGMA in order to offset acute health concerns and possibly other preventable health conditions (Cummings, 2003; Blount, 1998). Moreover, participants appear responsive to the DIGMA program and actual

results reveal that this cognitive behavioral intervention addressed hypertension management problems outside the scope of current pharmacotherapy regimens.

The paradigm shift the DIGMA invites among current healthcare approaches is not limited to the practices and beliefs of the providers. Moreover, it challenges the recipient to become pro-active with their health and to foster more dynamic relationships with their healthcare providers (Noffsinger, 1999). The integrative approach espoused by programs such as the DIGMA help cultivate active health self management and collaboration with one's provider, rather than reactive or noncompliant health management indicative of the traditional medical model (1999).

IRB approval for this study allows access to the participants' medical records over the next five years. Therefore, obtaining and investigating this information as part of a follow-up study would be a logical next step in researching this area of health psychology. Moreover, an additional DIGMA session in the future with follow up measures would help to increase longer tracking of participants and their functioning. In addition, one of the quantitative measures added could look at stages of change it see if participants significantly increase their motivation to make changes to their lifestyle. This would allow further conclusions about the efficacy of this program to be made.

IMPLICATIONS FOR COUNSELING PSYCHOLOGY

Findings concerning the efficacy of the DIGMA program are encouraging. The wide-ranging implications of this program follow previous suggestions of integrating behavioral health services and techniques (Cummings, et al, 1997; Epping-Jordan, 2005)

with primary medical care (Blount, 1998), setting in motion positive outcomes for individuals with hypertension. Moreover, programs similar to this allow for the partnership between behavioral medicine and primary care, with psychology becoming an active participant in treatment teams (Cummings et al, 1997; Blount, 1998), and in some cases, providers with diverse training are parts of a single treatment team (Blount, 2003; Pruitt et al, 1998). The prevalence of psychological disorders inundating primary care has compelled this setting to act as the de facto mental health system in the United States (Pinkus et al, 2005). However, the primary care system is by and large not prepared to handle psychological disorders. Therefore, with integrated care, the role of the psychologist is to function as a vital team member by addressing these concerns.

An intervention such as the DIGMA program values a patient's unique experience and fosters investigation into the process of initiating beneficial changes to health status, two recommendations set forth in creating health promoting programs (Anderson, et al 2000). In addition, the DIGMA program appears to produce ideal outcomes in a more resourceful approach than the traditional biomedical healthcare model. Moreover, cultivating an environment within healthcare where the patient functions as an informed consumer on their unique health situation may bring about a more collaborative dynamic between an individual and their healthcare provider, thus facilitating increased success in healthcare delivery (Cummings et al, 1997; Blount, 1998).

To facilitate such a paradigm shift it is essential for buy-in from the various healthcare provider groups such as primary care. Fearing change is the greatest jeopardy to successful new innovative treatment techniques (Gladwell, 2000). Because of this,

healthcare providers oftentimes struggle in understanding the benefits of a program like the DIGMA. As a result, program implementation and momentum which allows programs such as the DIGMA to sustain was and continues to be incredibly challenging. Psychologists can take an active role in fostering collaborative programs such as the DIGMA which help create interdisciplinary health services. Furthermore, increased patient health behaviors can occur with the success of integrated care (Dyer et al, 2005), resulting in adoption of behavioral practices that allow for better self-management of health. In this manner, psychologists would help to promote a beneficial awareness regarding one's health.

Within the VA healthcare setting, it is not uncommon for individuals to receive abbreviated contact with their healthcare providers (Yu et al, 2003). In addition to this, restricted access to health professionals may lead to inadequate health awareness. Furthermore, positive results would ensue if individuals were to abide by the recommendations put forth by their medical providers (Blount, 1998). However, based on the results of this study, it is apparent that solely receiving a directive from one's healthcare provider to engender health behavior changes is inadequate. It appears as though a shift in thinking about the problem as well as potential solutions must occur. A further consequence of restricted access between an individual and their healthcare provider lies with the provider being less knowledgeable of one's health concerns. Moreover, the vast caseloads faced by VA healthcare providers, combined with limited provider access may significantly hamper treatment effectiveness. In a setting inundated with considerable caseloads such as the VA healthcare system, psychologists may help

individuals build awareness of maintaining one's health, thereby offsetting the negative effects of restricted access to their primary care provider. This is evident in one participant's response to what his experience with the DIGMA: *"Previously, I didn't have a good opinion about the VA, but now, based on this program I feel cared for"*.

In addition to fostering better access and delivery of healthcare, programs such as the DIGMA which utilize a group modality of treatment allow individuals the unique opportunity to increase self-awareness through interaction with others (McCarthy, Mejia & Liu, 2000). Understanding that others encounter similar conditions such as hypertension or other healthcare concerns, and observing others model successful outcomes and practice new behaviors are characteristic of group interventions (Yalom, 1995). Anchored in these characteristics, the DIGMA program and other programs similar to this can help individuals increase their health outcomes.

Psychoeducational groups encourage personal growth and awareness through gaining knowledge from interactions with others (McCarthy, et al 2000). Components of the DIGMA program reflect elements of psychoeducational groups by cultivating personal growth and awareness through increased knowledge. Similarly, the DIGMA program promotes cognitive approaches, allowing participants to acknowledge links between thoughts and emotions. Positive health outcomes may develop from this increased awareness through the group modality of the DIGMA and other integrated health programs.

As previously put forth by Noffsinger (2000), group medical appointments such as the DIGMA may eventually decrease healthcare costs through patients' eventual

reduction in the amount of unscheduled doctor visits and reductions in hospital admissions. Furthermore, the DIGMA program may increase patient self care through the knowledge, self empowerment, and experience gained by group participation. Aside from increased access to comprehensive medical care, it is expected the significant advantages of group based programs such as the DIGMA are the mutual support, and an improved sense of self efficacy for each patient (Noffsinger & Scott, 2000). As earlier stated, it is recommended that healthcare work towards enhancing healthcare outcomes through increasing awareness of conditions, access to available resources, and encouraging self management (Epping-Jordan, 2005).

The role of psychology in creating programs which foster awareness of health maintenance, promotion of health behaviors and collaboration between disciplines is vital. As a result, it is expected that programs such as the DIGMA will help establish the burgeoning field of health psychology as an integral part of healthcare treatment far into the future.

Appendices

Appendix A

Demographic Information

Instructions: Depending on the question being answered, please either circle the appropriate response from the provided options or fill in the requested response in the space provided. Your participation in this study is voluntary, and completely confidential. Each question on this form captures a trait or phenomenon that significantly impacts your physiological functioning, and therefore it is very important to our being able to accurately interpret your data. We greatly appreciate your participation and cooperation.

1. Indicate your sex:

- 1 Male
- 2 Female

2. Indicate your age in the space below:

_____ years old.

3. Indicate your approximate height in the space below:

_____ feet _____ inches

4. Indicate your approximate weight in the space below:

_____ pounds

5. Indicate your race/ethnicity:

- 1 African American/Black
- 2 Asian/Asian American/ Pacific Islander
- 3 Latino(a)/Hispanic
- 4 European American/Caucasian/White
- 5 Other

6. Indicate your marital status:

- 1 Single
- 2 Married
- 3 Divorced
- 4 Divorced/Remarried
- 5 Widowed
- 6 Widowed/Remarried

Demographic Information

7. Indicate your employment status:

- 1 Full-time
- 2 Part-time
- 3 Retired
- 4 Currently not working

8. Indicate your occupation (historically) in the space provided:

9. Indicate your estimated yearly household income (before taxes):

- 1 Less than \$15,000.
- 2 \$15,000-\$29,999
- 3 \$30,000-\$44,999
- 4 \$45,000-\$59,999
- 5 \$60,000-\$75,000
- 6 Above \$75,000

10. Indicate your highest level of education completed:

- 1 Grade school (K-8)
- 2 High school (9-12)
- 3 Community college
- 4 Undergraduate college
- 5 Graduate school

11. Indicate your spouse's highest level of education completed:

- 1 Grade school (K-8)
- 2 High school (9-12)
- 3 Community college
- 4 Undergraduate college
- 5 Graduate school

12. How would you describe your overall health?

- 1 Excellent
- 2 Good
- 3 Fair
- 4 Poor

Demographic Information

Use the following information to answer questions # 13 and 14.

13. Indicate the types of food you usually eat:

- 1 High saturated fat foods all the time
- 2 High saturated fat foods most of the time
- 3 High saturated fat foods often
- 4 High saturated fat foods some of the time
- 5 Do not eat high saturated fat foods

14. How often do you substitute No-fat or Low-fat alternatives for High-fat foods; i.e. eat No-fat or Low-fat foods instead of High-fat foods:

- 1 Always
- 2 Almost Always
- 3 Often
- 4 Sometimes
- 5 Never

Demographic Information

15. Indicate how often you currently exercise or engage in physical activity of at least moderate intensity and duration, e.g. similar to brisk walking for 30 minutes:

- 1 Several times/day
- 2 Daily
- 3 Several times/week
- 4 Weekly
- 5 Monthly

16. Indicate how often you have historically exercised or engaged in physical activity of at least moderate intensity and duration, e.g. similar to brisk walking for 30 minutes or more:

- 1 Several times/day
- 2 Daily
- 3 Several times/week
- 4 Weekly
- 5 Monthly

17. Do you have a history of heart or coronary artery disease in your family (e.g., high blood pressure, high cholesterol, hypertension, angina, atherosclerosis, coronary artery disease, heart attack, etc.)?

- 1 Yes
- 2 No

*If Yes, Please briefly explain your relationship to your relative and the nature of the condition:

18. Do you have any current problems/struggles with anxiety, or are you currently diagnosed with an anxiety disorder?

- 1 Yes
- 2 No

*If Yes, Please briefly explain the nature and time frame of this condition:

Demographic Information

19. Do you have any past problems/struggles with anxiety, or have you ever been diagnosed with an anxiety disorder?

- 1 Yes
- 2 No

*If Yes, Please briefly explain the nature and time frame of this condition:

20. Do you have any current problems/struggles with depression, or are you currently diagnosed with a depressive disorder?

- 1 Yes
- 2 No

*If Yes, Please briefly explain the nature and time frame of this condition:

21. Do you have any past problems/struggles with depression, or have you ever been diagnosed with a depressive disorder?

- 1 Yes
- 2 No

*If Yes, Please briefly explain the nature and time frame of this condition:

22. Indicate how many hours you typically sleep each night (in ½ hr intervals):

- 1 10+ hrs
- 2 9 - 9.hours
- 3 8 - 8.hours
- 4 7 - 7.hours
- 5 6 - 6.hours
- 6 5 - 5.hours
- 7 less than 5 hours

Demographic Information

23. Indicate your smoking status:

- 1 Current Smoker
- 2 Ex-Smoker (no cigarettes within past 3 months)
- 3 Non-Smoker

24. Indicate the frequency with which you smoke cigarettes:

- 1 Two or more packs/day
- 2 One pack/day
- 3 Two or more packs/week
- 4 One or more packs/month
- 5 I do not smoke

25. If a Current Smoker or Ex-Smoker, approximate the total number of year you smoked:

- 1 16+ years
- 2 11-15 years
- 3 6-10 years
- 4 1-5 years
- 5 0 years

26. Indicate the frequency of any caffeine (coffee, tea, soda) consumption:

- 1 3-4+ drinks/day
- 2 1-2 drinks/day
- 3 Several drinks/week
- 4 Several drinks/month
- 5 No caffeine consumption

27. Indicate the frequency of current alcohol (12 oz beer=4 oz wine=1 oz liquor) consumption:

- 1 25+ drinks/week
- 2 13-24 drinks/week
- 3 9-12 drinks/week
- 4 5-8 drinks/week
- 5 1-4 drinks/week
- 6 No alcohol consumption

Demographic Information

28. Approximate the frequency of alcohol (12 oz beer=4 oz wine=1 oz liquor) consumption over your lifetime:

- 1 25+ drinks/week
- 2 13-24 drinks/week
- 3 9-12 drinks/week
- 4 5-8 drinks/week
- 5 1-4 drinks/week
- 6 No alcohol consumption

29. Indicate any recreational drug use within the past 24 hours:

- 1 Depressant (Rohypnol, Valium, heroin, etc. not including alcohol)
- 2 Stimulant (cocaine, speed, amphetamines, etc.)
- 3 Hallucinogen (marijuana, ecstasy, LSD/acid, mushrooms, etc.)
- 4 Other: _____ (please fill in)
- 5 No recreational drug use

Appendix B

PSS

Instructions:

The questions on this page ask you about your feelings and thoughts during THE LAST WEEK. In each case, you will be asked to indicate your response by circling the number that represents HOW OFTEN you felt or thought that way. Although some of the questions are similar, there are differences between them and you should treat each one as a separate question. The best approach is to answer fairly quickly. That is, do not try to count up the number of times you felt a particular way, but rather indicate the alternative that seems like a reasonable estimate.

1=Never, 2=Almost Never, 3=Sometimes, 4= Often, 5=Fairly Often

- | | | | | | |
|--|---|---|---|---|---|
| 1. In the last week, how often have you been upset because of something that happened unexpectedly? | 1 | 2 | 3 | 4 | 5 |
| 2. In the last week, how often have you felt that you were unable to control the important things in your life? | 1 | 2 | 3 | 4 | 5 |
| 3. In the last week, how often have you felt nervous and stressed? | 1 | 2 | 3 | 4 | 5 |
| 4. In the last week, how often have you dealt successfully with day to day problems and annoyances? | 1 | 2 | 3 | 4 | 5 |
| 5. In the last week, how often have you felt that you were effectively coping with important changes that were occurring in your life? | 1 | 2 | 3 | 4 | 5 |
| 6. In the last week, how often have you felt confident about your ability to handle your personal problems? | 1 | 2 | 3 | 4 | 5 |
| 7. In the last week, how often have you felt that things were going your way? | 1 | 2 | 3 | 4 | 5 |
| 8. In the last week, how often have you found that you could not cope with all the things that you had to do? | 1 | 2 | 3 | 4 | 5 |
| 9. In the last week, how often have you been able to control irritations in your life? | 1 | 2 | 3 | 4 | 5 |

10. In the last week, how often have you felt that you were on top of things? 1 2 3 4 5
11. In the last week, how often have you been angered because of things that happened that were outside of your control? 1 2 3 4 5
12. In the last week, how often have you found yourself thinking about things that you have to accomplish? 1 2 3 4 5
13. In the last week, how often have you been able to control the way you spend your time? 1 2 3 4 5
14. In the last week, how often have you felt difficulties were piling up so high that you could not overcome them? 1 2 3 4 5

Appendix C

Brief COPE Hypertension: (situational concurrent)

This list of items looks at ways that you cope with the stress in your life based on your diagnosis of Hypertension. I am interested in how you have been coping with this condition in the last week. I would like to know to how much or how frequently you do what the item says. Do not answer due to whether it seems to work or not, just whether or not you are doing it. Please choose from the following choices:

1= I do not do this at all 3=I do this a medium amount
2=I do this a little bit 4=I do this a lot

Because of my Hypertension, in the past week...

- | | | | | |
|---|---|---|---|---|
| 1. I've turned to work or other activities to take my mind off of it. | 1 | 2 | 3 | 4 |
| 2. I've concentrated my efforts on doing something about the situation I'm in. | 1 | 2 | 3 | 4 |
| 3. I've said to myself "this isn't real". | 1 | 2 | 3 | 4 |
| 4. I've used alcohol or other drugs to make myself feel better. | 1 | 2 | 3 | 4 |
| 5. I've gotten emotional support from others. | 1 | 2 | 3 | 4 |
| 6. I've given up trying to deal with it. | | | | |
| 7. I've taken action to try to make the situation better. | 1 | 2 | 3 | 4 |
| 8. I've refused to believe that this is happening. | 1 | 2 | 3 | 4 |
| 9. I've said things to let my unpleasant feelings escape. | 1 | 2 | 3 | 4 |
| 10. I've gotten help and advice from other people. | 1 | 2 | 3 | 4 |
| 11. I've used alcohol and other drugs to help me get through it. | 1 | 2 | 3 | 4 |
| 12. I've tried to see it in a different light, to make it seem more positive. | 1 | 2 | 3 | 4 |
| 13. I've criticized myself. | 1 | 2 | 3 | 4 |
| 14. I've tried to come up with a strategy about what to do. | 1 | 2 | 3 | 4 |
| 15. I've gotten comfort and understanding from someone. | 1 | 2 | 3 | 4 |
| 16. I've given up the attempt to cope. | 1 | 2 | 3 | 4 |
| 17. I've looked for something good in what is happening. | 1 | 2 | 3 | 4 |
| 18. I've made jokes about it. | 1 | 2 | 3 | 4 |
| 19. I've done something to think about it less, such as going to the movies, watching TV, reading, daydreaming, sleeping or shopping. | 1 | 2 | 3 | 4 |
| 20. I've accepted the reality of the fact that it has happened. | 1 | 2 | 3 | 4 |
| 21. I've expressed my negative feelings. | 1 | 2 | 3 | 4 |
| 22. I've tried to find comfort in my religion or spiritual beliefs. | 1 | 2 | 3 | 4 |
| 23. I've tried to get advice or help from other people about what to do. | 1 | 2 | 3 | 4 |
| 24. I've learned to live with it. | 1 | 2 | 3 | 4 |
| 25. I've thought hard about what steps to take. | 1 | 2 | 3 | 4 |
| 26. I've blamed myself for things that happened. | 1 | 2 | 3 | 4 |
| 27. I've prayed or meditated. | 1 | 2 | 3 | 4 |
| 28. I've made fun of the situation. | 1 | 2 | 3 | 4 |

Appendix D HPLP

This questionnaire contains statements regarding your *present* habits. Please respond to each item as accurately as possible and try not to skip any item. Indicate the regularity with which you engage in each behavior by circling:

1=never

2=sometimes

3=often

4=routinely

1. Discuss my problems and concerns with people close to me. 1 2 3 4
2. Choose a diet low in fat, saturated fat, and cholesterol. 1 2 3 4
3. Report any unusual signs or symptoms to a physician or other health professional. 1 2 3 4
4. Follow a planned exercise program. 1 2 3 4
5. Get enough sleep. 1 2 3 4
6. Feel I am growing and changing in positive ways. 1 2 3 4
7. Praise other people easily for their achievements. 1 2 3 4
8. Limit use of sugars and food containing sugar (sweets). 1 2 3 4
9. Read or watch TV programs about improving health. 1 2 3 4
10. Exercise vigorously for 20 minutes or more at least three times a week (such as brisk walking, bicycling, aerobic dancing, using a stair climber). 1 2 3 4
11. Maintain meaningful and fulfilling relationships with others. 1 2 3 4
12. Eat 6 – 11 servings of bread, cereal, rice, and pasta each day. 1 2 3 4
13. Question health professionals in order to understand their instructions. 1 2 3 4
14. Take part in light to moderate physical activity (such as sustained walking 30 – 40 minutes 5 or more times per week). 1 2 3 4

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| 15. Spend time with close friends. | 1 2 3 4 |
| 16. Eat 2 – 4 servings of fruit each day. | 1 2 3 4 |
| 17. Get a second opinion when I question my health care provider's advice. | 1 2 3 4 |
| 18. Take part in leisure-time (recreational) physical activities (such as swimming, dancing, bicycling). | 1 2 3 4 |
| 19. Feel content and at peace with myself. | 1 2 3 4 |
| 20. Find it easy to show concern, love, and warmth to others. | 1 2 3 4 |
| 21. Eat 3 – 5 servings of vegetables each day. | 1 2 3 4 |
| 22. Discuss my health care concerns with health professionals. | 1 2 3 4 |
| 23. Do stretching exercises at least three times a week. | 1 2 3 4 |
| 24. Touch and am touched by people I care about. | 1 2 3 4 |
| 25. Eat 2 – 3 serving of milk, yogurt, or cheese each day. | 1 2 3 4 |
| 26. Inspect my body at least monthly for physical changes/danger signs. | 1 2 3 4 |
| 27. Get exercise during usual daily activities (such as walking during lunch, using stairs instead of elevators, parking far away from destination and walking). | 1 2 3 4 |
| 28. Find ways to meet my needs for intimacy. | 1 2 3 4 |
| 29. Eat only 2 – 3 servings from the meat, poultry, fish, dried beans, eggs, and nuts group each day. | 1 2 3 4 |
| 30. Ask for information from health professionals about how to take good care of myself. | 1 2 3 4 |
| 31. Check my pulse rate when exercising. | 1 2 3 4 |
| 32. Get support from a network of caring people. | 1 2 3 4 |

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|---|---|---|---|---|
| 33. Read labels to identify nutrients, fats, and sodium content in packaged food. | 1 | 2 | 3 | 4 |
| 34. Attend educational programs on personal health care. | 1 | 2 | 3 | 4 |
| 35. Reach my target heart rate when exercising. | 1 | 2 | 3 | 4 |
| 36. Settle conflicts with others through discussion and compromise. | 1 | 2 | 3 | 4 |
| 37. Eat breakfast. | 1 | 2 | 3 | 4 |
| 38. Seek guidance or counseling when necessary. | 1 | 2 | 3 | 4 |

Appendix E

Telephone Interview - Graduates

1. Thinking back over the past month, please talk about any changes you have made to your routine.

Probe A - This might include eating habits, exercise, dealing with stress.

Probe B – To what or whom do you attribute these changes (if any)?

2. What do you feel that you can attribute these changes to, if any?
3. How have your feelings of stress in relation to your health concerns changed, if at all?

Probe –Discuss any changes to stress levels in the way you think about your healthcare provider.

4. Have you noticed any changes in the way you deal with stress in relation to your health problems?

Probe A– this might include changing your activities or diet as well as seeking help from professionals.

Probe B – Is this a change for you over the past month?

5. What was your experience of the DIGMA program like?

Probe A - In your recollection, what were the most positive aspects of the DIGMA program?

Probe B – What were some of its shortcomings? Or what could be added to improve the program?

Appendix F

Telephone Interview – Dropouts

1. Our records indicate that you did not complete all three sessions of the DIGMA program. Please let me know what happened that prohibited you from attending.

Probe – Did the DIGMA not appear to meet your needs?

2. What was your experience of the DIGMA program like?

Probe A - In your recollection, what were the most positive aspects of the DIGMA program?

Probe B – What were some of its shortcomings?

Probe C - What would be some things that you believe would help enhance the program? Would you be willing to reenroll?

**Appendix G
Consent Form**

GROUP MEDICAL APPOINTMENTS [also known as Doctor Interactive Group Medical Appointments or DIGMAs] are shared medical appointments with a group of other patients and their significant others or family members. They are considered to be part of your medical treatment. During the group appointment, your health care provider will discuss your medical condition with you and other members of your group. You will have the benefit of learning from information that your health care provider shares with the group.

HEALTH CARE PROVIDERS who participate in your group medical appointment will be VA employees and may include physicians, nurses, pharmacists, social workers, psychologists, clerks and other VA staff members.

YOUR PARTICIPATION IS VOLUNTARY and does not mean that you give up your right to individual medical appointments. If you decline the opportunity to participate in the group or if you withdraw from the group, it will not affect your right to medical treatment in the VA. You may withdraw from the group and/or request a private appointment with your health care providers at any time.

REQUIREMENTS TO PARTICIPATE include your agreement:

Not to repeat any information about any other group member or discuss any confidential information with anyone outside of the group;

Not to contact any other group member to discuss confidential information after the group appointment;

To bring only one member of your family or your significant other to the group medical appointment;

To participate in all four group appointments;

To fill out all requested information;

Willingness to have phone contact with group facilitators after appointments.

CONFIDENTIALITY AGREEMENT: Group medical appointments involve patients sharing private medical and psychological information in the presence of other patients and family members. Your health care providers may release medical or psychosocial information about you and your family member that will be heard by other members of the group. This information may contain discussion about such sensitive medical problems such as alcohol or drug abuse and/or treatment, your HIV/AIDS status, and sickle cell anemia.

You have the right to privacy and you may decline to share information with this group. If you do not want certain information discussed by your health care providers, please specifically indicate in the comments section below what information you do not wish to discuss in a group setting.

COMMENTS:

Your health care providers will respect your right to privacy and will not discuss this information in the group setting. If you do not indicate that you want certain information to remain confidential, however, your health care provider will freely medical and psychosocial information during the group appointment.

YOUR SIGNIATURE AT THE BOPTTOM OF THIS FORM INDICATES:

You voluntarily agree to participate in the group medical appointment and that you have had the opportunity to ask questions concerning the group appointment.

You will respect the privacy of all persons who attend the appointment and keep all information confidential.

You have consented to release of your private medical and psychosocial information, with the exception of any information that you noted in the *Comments* section above.

NAME (please print your full name):

_____ D.O.B. _____

SIGNIATURE: _____

DATE: _____

SIGNIATURE OF FAMILY MEMBER OR

SIGNIFICANT OTHER: _____

SIGNIATURE OF

WITNESS: _____

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Vita

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