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Efficacy of the Doctor Interactive Group Medical Appointment: Examining patient behavioral and attitudinal changes attributed to an integrated healthcare model.

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Efficacy of the Doctor Interactive Group Medical Appointment: Examining patient behavioral and attitudinal changes attributed to an integrated healthcare model.

by

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Efficacy of the Doctor Interactive Group Medical Appointment: Examining patient behavioral and attitudinal changes attributed to an integrated healthcare model.

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The Doctor Interactive Group Medical Appointment (DIGMA) is a group health intervention that combines the services of behavioral health and primary care. The DIGMA was first invented by Edward Noffsinger in 1996, in response to his own difficulties with the overtaxed primary care system at Kaiser Permanente in California (Noffsinger, 1999). Integrating healthcare services in this way has practical implications such as efficient use of resources, treating multiple complaints at once, and beginning to view the mind and body as one (Noffsinger, 1999; Engel, 1977).

The DIGMA at the Austin Veterans Outpatient Clinic was designed to address the specific needs of veterans with hypertension. It consists of 4 sessions of 1.5 hours each and addresses such varied topics as exercise, stress-management, nutrition, and medication adherence. These topics are discussed in a group format with the tenets of group psychotherapy (Yalom & Leszcz, 2005) as a backdrop.

An exploratory study was warranted to determine whether programs of this sort would be effective on a broad scale. A pretest/posttest design was utilized to determine if the DIGMA was effective at reducing symptoms of hypertension; improving health promoting behavior; increasing self-efficacy to manage hypertension; and increasing internal health locus of control while decreasing chance and powerful others health locus of control. Groups were conducted over a period of seven months with a total of 73 male veterans enrolled in the study. The final n was 58.

Findings indicated that both systolic and diastolic blood pressure readings were reduced significantly from pretest to posttest. Health promoting behavior increased significantly; hypertension self efficacy increased significantly; and locus of control did not change significantly from pretest to posttest.

The exploratory study concluded that the DIGMA may be efficacious for a variety of aspects of the management of hypertension. It is suggested that further research be conducted but that integrating services in this way can lead to improved patient outcomes and can also be cost-effective.

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CHAPTER 1: INTRODUCTION

The Group Medical Appointment (GMA) is one of several innovations borne of the field of Health Psychology. In 1996, Edward Noffsinger, PhD designed the Drop-in Group Medical Appointment (DIGMA) to address three issues faced by primary healthcare. First, the DIGMA was intended to reduce costs by allowing physicians to see more patients without using more resources. Second, patient satisfaction was to be improved by increasing access and improving continuity of care. And third, physician satisfaction would be improved (Gordon, 2001).

By design, primary care acts as a catchall for a variety of health problems. However, primary care settings are intended largely for medical interventions. Even so, 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 care takes into account multiple aspects of health from the physiological to the psychological (Blount, 2003). It suggests more comprehensive sharing between disciplines and in some cases providers with diverse training are parts of a single treatment team (Blount, 2003; Westheimer, Brownson & Steinley-Bumgarner, 2005). Integrated care also suggests a change not only in the delivery of health services but also in patient behavior (Dyer, Levy & Dyer, 2005). The desired effect is that an individual will take behavioral steps, acting on his or her own behalf in managing health.

This would represent a major paradigm shift, as patient and provider would become partners in health maintenance, both partners contributing knowledge and taking appropriate action to achieve desired health results.

Considering the health of the whole person is not a new concept. Engel's seminal (1977) article introduced the Bio-psychosocial model to the healthcare fields. In his article, Engel (1977) points out that the biomedical model suggests that disease can be broken down into "measurable biological variables" (Engel, 1977). Engel (1977) points out that the biomedical model leaves out the possibility of psychological or social factors as having any impact on health. The Bio-psychosocial model takes these additional aspects into account in the quest to understand disease as it affects the whole person.

Treating the whole person has proven challenging in the current health care system, particularly so for treating patients with chronic conditions. It has been shown that health care providers struggle with the time constraints placed upon them by large caseloads (Gray, Brody, & Johnson, 2005; Westheimer, Steinley-Bumgarner, & Brownson, in press). Chronic health problems represent half of the entire global disease burden (Epping-Jordan, 2005). According to 1999 VA healthcare system figures healthcare expenditures totaled $14.3 billion dollars. 72% of patients with common chronic diseases accounted for 96% ($13.7 billion) of this total. Hypertension was found to be the most common chronic disease among this list (Yu et al., 2003).

Often, those with chronic health conditions, such as hypertension, require more time with their physician than the typical 15 minute visit. In the present healthcare environment, the need to integrate mental health services with primary care would be beneficial to the overall health of the population (Trotto, 1999).

Programs dealing with chronic health conditions, also called disease management, have been medically focused where mental health issues are not adequately addressed (Cummings, 2003). More recently, interventions that promote stress-management, nutrition and exercise have come to play an integral role in the successful management of chronic health problems (Gonder-Frederick, Cox & Ritterband, 2002; Levant, 2005).

The science of psychology is, at its most basic, the science of human behavior. As such this science would seem a welcome addition to traditional medicine, which, as research has shown, depends so heavily upon the behavior of the patient for positive outcomes.

Meeting the physiological and mental health needs of patients whose difficulties are less acute in a format befitting their health needs would be an improvement in the efficiency of health care provision (Epping-Jordan, 2005). The group medical appointment is one example of a format ideally suited to providing care to people with chronic problems. Behavior modification can be taught to groups, group members can learn tips from one another, and the group can validate individuals' struggles with their chronic health problems.

Overview of the current study

The current study intends to examine the efficacy of a group health intervention for veterans with hypertension. The intervention is called the Doctor Interactive Group Medical Appointment (DIGMA). Veterans with hypertension were recruited to participate in a novel health intervention. They were asked to attend four meetings of an hour and a half each. Each of the meetings was structured to address the various

cognitive and behavioral components associated with the management of hypertension. Primary care at the Austin Veterans Outpatient Clinic collaborated with VA Behavioral Health to create an integrated intervention that addresses physiological, medical, and behavioral needs of group participants simultaneously. Group members were exposed to information about stress management, nutrition, exercise, and medication adherence. Throughout the four week process they were encouraged to take an active part in the group process by sharing their experiences with the group, asking questions, and helping other group members.

As part of participation in the DIGMA, members were requested to fill out pretest and posttest survey material looking at health behavior, health-related locus of control, and self-efficacy specific to hypertension. At follow-up they were asked to answer interview questions aimed at gaining insight into the participants' experience of the DIGMA. These qualitative data will also be used for further program development. This exploratory data has been examined to uncover possible associations between participation in the DIGMA group and biological and psychosocial variables. Data has also been examined to aid in the further development of the DIGMA for future use.

Results of this exploratory study will be utilized to influence further program development at the VA such that integrated healthcare programs similar to the DIGMA may become more commonly relied upon as standard care procedures for the management of chronic health problems. It is hoped that the results from this mixed methods exploratory study will encourage VA administrators to undertake a longer term, funded study on integrated healthcare modalities such as the DIGMA with the goal of lending further proof to their efficacy and cost-effectiveness.

CHAPTER 2: REVIEW OF THE LITERATURE

Health psychology, as a discipline, starts from the approach that physical health and behavioral health are inextricably intertwined. Furthermore, the etiology of many behavioral health disorders, including anxiety, depressive and stress related disorders, can be tied to physical and/or chronic health complaints (Sapolsky, 1998). Behavioral health concerns such as attitudes and habitual behaviors can exacerbate physical symptoms and impede patient driven changes in health promoting behaviors and treatment compliance.

In light of the above it might appear that there is a quick fix for patients not heeding physicians' behavioral advice by just increasing patient education. As a result, under the current healthcare paradigm, patients are frequently presented with copious amounts of information from health care professionals regarding such prescriptions as, changes in diet, increased exercise and medication management. However, the overwhelming incidence of preventable disease in the United States suggests that even with appropriate information, it is difficult at best for patients to make these behavioral and lifestyle changes (CDC, 2006). A major contributing factor to this finding may be that while information does exist, it is not being effectively disseminated throughout the lay population (Kottke, Stroebel, & Hoffman, 2003). Also, as is shown in the current research, an individual's belief in his ability to adopt new health behaviors, or self-efficacy, tends to have an impact upon whether or not behaviors are implemented. There may be some connection between the way health information is presented and the development of a sense of self-efficacy to utilize the information appropriately for healthy outcomes.

Thus ineffectiveness in health care practice results as exposure to information apparently does not automatically result in changes in lifestyle or other health related behaviors. Due to these and other concerns with traditional approaches to medicine, Health Psychology has emerged as a discipline to assist patients in turning positive health behavior knowledge into sustainable practice. Working in conjunction with physicians and other primary care staff, health psychologists aim to support patients through the behavior changes prescribed by their physicians, while also addressing other behavioral health needs (APA, 2007). This represents the development of a more comprehensive approach in the search for improved health outcomes.

The aim of this dissertation is to examine whether the DIGMA program can be attributed to changes in health promoting behavior eventually resulting in increased control over hypertension symptoms. It is theorized that both self-efficacy and locus of control are directly associated with health behavior changes. As such, these constructs will be examined as predictor and outcome variables associated with health behavior change and subsequent increased stability of blood pressure.

Some thoughts have been generated regarding the underlying agents of behavior change (Krause et al., 2006; Prochaska & Norcross, 2001). Self-efficacy refers to ones belief or confidence in his or her ability in a given domain. An individuals' level of self-efficacy would appear to be one such agent of behavior change as his or her sense of confidence may dictate whether or not to make a lifestyle change (Luszczynska & Schwarzer, 2005; Bandura, 1997). Locus of control also appeals to the possibility that the patient is autonomous and has the ability to adopt behaviors that he or she has learned will bring beneficial results (Luszczynska & Schwarzer, 2005; Wallston, Wallston &

Devellis, 1978). Stress and coping are integral to the connection between the mind and body (Lovallo, 2005; Martin & Brantley, 2004; Lazarus & Folkman, 1984). A variety of chronic ailments including hypertension have been thought to be impacted by stress and the subsequent ability to cope with it (Tuomisto, Majahalme, Kahnonen, Fredrickson, & Turjanmaa. 2005). The group treatment modality allows patients to engage their health topics in a social milieu. Many DIGMA participants are retired and as their health begins to falter, they have fewer social contacts to lean on and with whom to share their experiences. Engaging these individuals in a group format is efficient from the perspective of the provider and, it is anticipated, generates positive health outcomes as well. These concepts represent some of the constructs that may either inhibit or facilitate the change process. However, it is also imperative to introduce literature that specifically addresses the process of change (Prochaska & Norcross, 2001) in which an individual progresses through a series of six stages of change.

The central theories and constructs upon which this study has been built have now been introduced. The remainder of this chapter will address details about the chronic health problem that is being targeted by this intervention, the psychosocial variables theorized to be associated with its successful management, and an explanation of how a group modality may be an ideal format for an intervention of this sort with this particular population.

Hypertension

Hypertension (HTN) is a chronic health ailment affecting roughly 50 million Americans (Joint National Committee, 2003). Individuals with systolic blood pressure of

140 mm Hg or greater, diastolic blood pressure of 90 mm Hg or greater, or those taking antihypertensive medication are believed to have HTN (Blumenthal, Sherwood, Gullette, Georgiades & Tweedy, 2002). Age, gender and ethnicity are associated with HTN prevalence with advanced age accounting for increased prevalence, regardless of gender or ethnicity (Blumenthal et al., 2002). Younger men tend to have higher prevalence of HTN while this trend tends to change at or around age 50, at which point the prevalence of HTN for women tends to surpass that of men (as cited in Blumenthal et al., 2002). African Americans tend to have a higher prevalence of HTN than European Americans (as cited in Blumenthal et al., 2002). While technically, HTN is the increased pressure exerted upon the arteries and damage to the arteries is a potential result, HTN is often clinically associated with the strain placed upon vital organs such as the heart, brain, and kidneys and the morbid events associated therein (Blumenthal et al., 2002). The Joint National Committee on Detection, Evaluation, and Treatment of High Blood Pressure (2003) describes optimal blood pressure as lower than 120/80 mm Hg.

Systolic blood pressure is the pressure exerted upon the arteries while the heart is in an active 'pumping' phase while diastolic blood pressure is the pressure exerted upon the arteries while the heart rests in between beats (American Heart Association, 2007). Recent findings indicate that systolic blood pressure continues to increase over the entire lifespan, while diastolic blood pressure increases up to age 50 and then begins to level off or decline (Joint National Committee, 2003). Furthermore, the prevalence of systolic HTN increases with age and beyond the age of 50 years becomes the most common form of HTN (Joint National Committee, 2003). Systolic HTN appears to be associated with stress (Frommer et al., 1986). However, most coronary blood flow occurs while the heart

is at rest in diastole. Thus while systolic only HTN is frequently treated in clinical settings, diastolic HTN is as crucial to address (American Heart Association, 2007; JNC, 2003).

The Joint National Committee (2003) reports a failure on the part of healthcare to turn current knowledge regarding the management of HTN into action. They state that control of HTN symptoms has stagnated at 34% nationally (Kottke, Stroebel & Hoffman, 2003). This statistic suggests that of the population of patients undergoing treatment for HTN symptoms, only one third of them are achieving the target blood pressure. Further, a recent study in Canada found that 42% of HTN sufferers are unaware that they have HTN; 19% receive no treatment for their HTN; and 23% are uncontrolled despite receiving treatment (McAlister, Wooltorton, & Campbell, 2005). Findings from the Joint National Committee (2003) were similar with approximately 30% unaware of their HTN status, greater than 40% untreated and 67% not controlled to blood pressure levels less than 140/90 mm Hg.

The standard of care for patients with HTN typically consists of pharmacological interventions utilizing a diuretic combined with one or more of the following major classes of drugs: beta-adrenergic blockers, calcium antagonists, and angiotensin-converting enzyme (ACE) inhibitors. Outcomes of the pharmacological standard mentioned above were illuminated by a large study conducted by the European Working Party on High Blood Pressure in the Elderly. The study, entitled Systolic Hypertension in Europe (Syst-Eur), found that at 2 years follow-up systolic and diastolic blood pressures in the treatment group (n = 2398) had fallen by 23 and 7mm Hg as compared to the placebo control group (n = 2297), whose systolic and diastolic blood pressures had fallen

by 13 and 2mm Hg (Staessen et al., 1997). These reductions can be viewed as benchmarks for typical treatment regimens.

Importantly, health promoting lifestyle modifications are suggested to accompany pharmacotherapy (Blumenthal et al., 2002; Joint National Committee, 2003). It has been widely understood that lifestyle and behavior have a significant impact upon blood pressure such that any comprehensive treatment of HTN should include cognitive and behavioral components such as exercise, dietary changes, and stress management (Blumenthal et al., 2002; Joint National Committee 2003).

Regardless of these suggestions, it is less frequent that an HTN patient will undergo behavioral treatment, instead relying almost exclusively upon pharmacological treatment to manage their condition. A change in the standard of care is certainly warranted given the difficulty HTN patients seem to display when confronted with the behavioral aspects of HTN management (JNC, 2003). Addressing these behavioral aspects in a group setting may capitalize upon important social dynamics addressed in the group literature later in this chapter. Also, treating 10-15 people at once is certainly more efficient in terms of resource management; the 1.5 hours the medical staff devotes to this program is spread out among the entire group.

Given that there is a subset of HTN sufferers who are uncontrolled by medication (JNC, 2003; McAlister et al., 2005) it might be hypothesized that pharmacological means alone are not sufficient to treat this ailment on a large scale. It seems plausible that the medications do well to treat symptoms but ignore the underlying cognitive, behavioral, and emotional processes that bring these symptoms about in the first place. As such,

further exploration about these processes is warranted with the hopeful result of solid theoretical understanding of non-medical components to the management of HTN.

Theoretical Constructs Hypothesized to be related to Patient Change

In conceptualizing possible agents of change among the population of interest a variety of constructs were considered. Clearly, the impact of the group process itself upon behavior is of importance. Of additional interest in the current study are measures of health-related locus of control and self-efficacy specific to the management of HTN. Simultaneous to the current study, a colleague will examine the impact of levels of perceived stress and coping upon the adoption of health promoting behaviors.

STAGES OF CHANGE

Prochaska and DiClemente (1983) introduced the stages of change theory as they examined the process of smoking cessation. Since then the theory, also described as the transtheoretical model, has been adapted for use in broader applications (Prochaska, 1991; Prochaska, DiClemente, and Norcross, 1992; Prochaska & Salis, 2004) addressing phobia, psychotherapy utilization, physical activity, and nutrition to name only a few.

In the transtheoretical model, an individual progresses through six distinct stages in order to change behavior. While each person may vary on the amount of time spent on each stage, the stages themselves are thought not to vary and must be completed in order (Prochaska & Norcross, 2001). The following description of the stages of change are excerpted from Prochaska and Norcross (2001): The first stage is precontemplation, where the individual is unready to change and is likely unaware of the need to change. The precontemplators' problems may, however, be obvious to family and friends. The

second stage is contemplation, where the individual is aware of a need to change but has not yet made a specific commitment to alter behavior. This second stage can often require long periods of time to pass through. The third stage is called preparation, where the intent to change is present. An individual in this stage will have attempted unsuccessfully to change in the past year and is currently planning to make a change. They may have achieved minor changes but are not yet in an active change process. The fourth stage is the action stage in which actual behavior change is occurring in the interest of solving the problem. This stage requires considerable time and commitment to the outcome of change. In the action stage, the individual will have noticed the greatest difference of all the stages and will also receive external validation for his or her efforts. The fifth stage is the maintenance stage, in which the individual attempts to create a lasting effect of the changes made over the past four stages. Being able to maintain the newly acquired healthy behaviors without relapse for 6 months or more is required to be considered in the maintenance stage. The sixth and final stage of change is called termination. In this stage, the individual has successfully progressed through the change process and is no longer tempted to relapse (Prochaska & Norcross, 2001).

As these stages have been described in the literature, it has been posited that self-efficacy has an important impact upon an individual's ability to progress through the change process (Levesque, Prochaska, J.M., & Prochaska, J.O., 1999; DiClemente, Prochaska, Fairhurst, & Velicer, 1991). Thus, the role of self-efficacy as it pertains to the success of the DIGMA program cannot be underestimated.

The DIGMA, though not designed specifically to shepherd participants to the subsequent stage of change, certainly relies upon this model for its efficacy. Participants

are offered information about the comprehensive management of their HTN symptoms and are asked to discuss these as well as their own experiences in a group format. They are also challenged to come up with new adaptive behaviors that they can envision themselves adopting. The trans-theoretical model has informed the current research and serves as a backdrop for this investigation. No formal assessment of stages of change was carried out with the current study participants.

While the DIGMA participants are the central focus of this research, it is important to note that stages of change theory also applies to the setting in which this novel healthcare approach is being proposed. Interestingly, some of the same researchers mentioned above have addressed just this topic as they researched the possibility of integrated healthcare services in a college health setting (Levesque, Prochaska, J.M., & Prochaska, J.O., 1999).

USE OF GROUPS AS A TREATMENT MODALITY

Bandura (1977) suggested that most social learning occurs through one's observation and imitation of the behavior of others. A group therapy dynamic allows individuals to collaborate and share their subjective experiences with others (Yalom & Leszcz, 2005). 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). Yalom & Leszcz (1995) note various limitations of individual therapy sessions which, he posits, are compensated for by benefits of the group format. These benefits include universality: knowing that others

have similar problems; modeling: seeing others model successful outcomes from therapy; and the sense of belonging and support that can result from interaction with other group members (Yalom, 2005).

The educational component is another boon to a group intervention. Originally utilized for educational settings, psychoeducational groups encourage participants to develop awareness and growth through increased knowledge (McCarthy et al., 2000). Further, because didactic information is emphasized, 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 assist in detecting distorted thinking or irrational beliefs (Ellis, 1992; Beck & Weishaar, 1989; as cited in McCarthy et al., 2000), which may stimulate physiological responses. These physiological responses may increase stress, which has strong implications for heart conditions such as high blood pressure or HTN. By educating participants about the impact of maladaptive thinking upon stress, participants may begin to recognize the association between thoughts and emotions. It is anticipated that positive health outcomes will result from this improved awareness.

As part of a community beset by cutbacks and fiscal stringency, veterans are often given the cost effective option of group treatment for problems such as PTSD and chronic pain (Bolton, Lambert, Wolf, Raja, Varra & Fisher, 2004; Butler & Fuhriman, 1986; Moore & Chaney, 1985)). Cost effectiveness has often been cited as one of the positive aspects of the group modality, solidifying it as a treatment method often utilized in many health settings (Butler & Fuhriman, 1986, Moore & Chaney, 1985).

Working with people with chronic health conditions may require some specific skills on the part of the group leader. Some of these are: the ability to deal with powerful feelings; convincing members to focus on other aspects of life; allowing members to be experts; cutting off members who are dominating the group; being knowledgeable about HTN; and understanding the psychological ramifications of living with a chronic illness (Jacobs, Masson, & Harvill, 2006), thus a competent group leader must be adept in these areas.

The group medical appointment is one example of a format ideally suited to providing care to people with chronic problems. Behavior modification can be taught to groups, group members can learn from one another, and individuals' struggles with their chronic health problem can be validated and supported by the group.

SELF-EFFICACY

Albert Bandura (1977) described self-efficacy as an individuals' perceived ability to cope with challenging situations, whether or not the individual would chose to initiate coping behaviors, and to what extent these behaviors can be sustained in the face of continued stress. Bandura (1986) depicted self-efficacy as specific to performance situations or domains. With this addition to the theory it was then posited that self-efficacy should not be considered merely a generalized personality trait. Rather, it is intimately connected to a specific situational context and therefore may differ within an individual given their beliefs about their capacities within the domain of interest (Bandura, 1997). Findings have also indicated that domain specific self-efficacy has

positive associations with outcomes such as frequency of exercise among elderly women (as cited in Waldrop, Lightsey Jr, Ethington, Woemmel, & Coke, 2001).

Levels of self-efficacy have been examined extensively in relation to its impact on health factors. For example Steptoe, Perkins-Porras, Rink, Hilton & Cappuccio (2004) found that higher self-efficacy was related to adoption of a diet of increased fruits and vegetables. In another study, self-efficacy was found to mediate the relationship between a preventable chronic illness and health promoting behavior (Sacco, Wells, Vaughan, Friedman, Perez & Matthew 2005). Other findings have indicated that overweight persons were more likely to respond to behavioral treatment techniques when self-efficacy was high (as cited in Schwarzer & Renner, 2000). Still other findings have linked self-efficacy with the daily activity levels among cardiac patients (as cited in Waldrop et al., 2001). Self-efficacy has also been found to be influenced by social support, which was associated with improved adjustment to health issues (Major, Cozzarelli, Sciachittano, & Cooper, 1990).

It has become clear that compliance with medication regimens, exercise programs, diet, as well as other health interventions is crucial for improved health outcomes. In this vein, an interesting finding is that self-efficacy has been positively correlated with health regimen compliance among patients being treated for HTN (Hoelscher, Lichstein, & Rosenthal 1986). In Hoelscher et al. (1986) the authors undertook a study to assess the efficacy of relaxation programs in the reduction of HTN symptoms. They assessed self-efficacy specific to relaxation practice at three points during their study and found moderate coefficients between self-efficacy and monitored relaxation practice.

Considering the domain-specificity of the concept of self-efficacy mentioned above, it would be of little to use to examine a global measure of self-efficacy in making attributions about the actions or potentials of patients struggling to better manage their HTN symptoms. Thus, a self-efficacy measure designed to elicit beliefs related to health in general and, more specifically, HTN will be proposed for use with the population in question here. A measure of self-efficacy specific to cardiac conditions (CardSE) was developed by Sullivan, LaCroix, Russo & Katon (1998). This measure was adapted for the current study to address HTN concerns.

It is hypothesized for this study that the DIGMA will have a positive impact upon HTN self-efficacy. It is also hypothesized that an individuals' baseline level of self-efficacy specific to HTN will determine the degree to which that person can employ the behavioral changes suggested by the DIGMA. Thus, HTN self-efficacy is being viewed here as an independent variable, those with lower HTN self-efficacy will reap fewer benefits from the DIGMA intervention than those who rate themselves high on HTN self-efficacy.

HEALTH BEHAVIOR

A healthy lifestyle involves more than merely preventing disease; it also includes behaviors that aim to sustain well-being, engender self-actualization, and foster personal fulfillment (Blaccioniere & Oleckno, 1999). Individuals suffering from chronic health conditions such as HTN may need to consider a variety of health behaviors as they attempt to deal holistically with their condition. The DIGMA program aims to bring some of these behaviors into focus.

As the DIGMA treatment program was administered to veterans, it was hoped that group members would elect to change their behavior to benefit their health. It has been recognized that merely providing information, such as in that of a classroom setting, is not enough to ensure that new health promoting behaviors will be adopted. This inspired an inquiry into the difference between experiences that cause people to change behavior and those that do not. Findings seem to indicate that the DIGMA falls into the category of the former.

The need to consult behavior change theory became apparent. One hallmark theory relating to behavior change is the Theory of Planned Behavior (TPB) (Schifter & Ajzen, 1985). This theory posits that a significant predictor for the performance of a behavior is the *intention* to perform the behavior. These intentions are predicted by the following: Attitudes, subjective norms, and perceived behavioral control. Attitude can be described as the individuals' evaluation of their performing the behavior. Subjective norms refer to perceived sense of the opinions of significant others related to the behavior. Perceived behavioral control is thought to be quite similar to Bandura's (1977) description of self-efficacy, which looks at an individuals' appraisal of their capacity to perform a given task (Ajzen, 1998; Schifter & Ajzen, 1985; Sheeran, Norman & Conner, 2001).

Referring to Schifter and Ajzen's (1985) TPB, it was expected that the DIGMA would have primary impact upon attitude and perceived behavioral control. The DIGMA was also expected to have a secondary impact upon subjective norms. It was thus hypothesized that health promoting behaviors will be increased for individuals participating in the DIGMA program. It was anticipated that individuals rating

themselves low on health promoting behaviors at program initiation would rate themselves measurably higher at termination.

Another aspect of behavior change relates to whether or not an individual feels or believes that a new behavior is within his or her realm of influence. The concept of locus of control would address these feelings or beliefs.

HEALTH LOCUS OF CONTROL

Derived from Rotter's (1954) Social Learning Theory, Locus of Control (LOC) refers to the degree to which an individual feels that outcomes are a result of their own actions (internal) or otherwise resulting from the actions or desires of outside forces (external). Wallston, Wallston, and Devellis (1978), based upon the previous Internal/External (LOC) construct introduced by Rotter (1971), designed a Health Locus of Control measure.

The construct of Health Locus of Control (HLOC) would seem to relate to variables of interest here. Indeed medication adherence has been linked to locus of control beliefs (O'Hea, Grothe, Bodenlos, Boudreaux, White & Brantley 2005). Findings such as these may have broad implications for individuals with chronic health problems such as HTN. The Multidimensional Health Locus of Control Scales (Wallston, Wallston, & DeVellis, 1978) measures an individual's location of control over health-related concerns. Originally it was conceptualized that locus of control existed along a continuum with internal (I) or external (E) at the anchors. More recently this theory has been revised to suggest that these two belief orientations are independent of one another (Wallston, 1992; Luszczynska & Schwarzer, 2005; Wallston. 2005). Also, the external

locus of control construct was divided into two parts, powerful others locus of control and chance locus of control. Individuals with a high powerful others locus of control place their faith in authority figures to make sure outcomes are positive. Individuals with a high chance locus of control believe that occurrences are more attributable to chance than to any specific set of actions (Wallston 1992).

An individuals' belief that his or her behavior can impact health outcomes could serve as a valuable resource for that person when faced with illness. For example, an individual who believes that an ailment was the result of chance may not respond and seek help immediately, while another individual who believes his or her health is in the hands of health providers (powerful others) would be reluctant to change behavior to produce the desired outcomes (Wallston et al., 1978).

COPING WITH STRESS

The current study is being conducted in collaboration with a colleague. This colleague is conducting a concurrent study that addresses stress and coping and its impact upon blood pressure and as it is impacted by participation in the DIGMA. This section addresses the constructs of stress and coping, as connections between these constructs and those of interest in the current study, specifically self-efficacy and locus of control, are important to explore.

Stress and coping have been implicated in health-related research on numerous occasions (Lovallo, 2005; Martin & Brantley, 2004). As stated earlier, stress has been indicated in connection with systolic HTN (Frommer et al., 1986). As such, it would be remiss to ignore the topic of stress in a study that addresses blood pressure management.

Coping with stress is a concept that relates closely to self-efficacy in that in order to select a coping method, one must first have a sense that he or she will be able to be successful should coping be initiated. Similarly, locus of control relates to coping with stress as the initiation of a coping method would depend upon ones belief about whom or what is in control of the outcome. Further clarification on coping and stress are warranted here.

There has been confusion regarding the various functions and definitions given for the concept of coping (Lazarus & Folkman, 1984). Lazarus & Folkman (1984) proposed a transactional model of stress and coping. This newer model was partially a response to a more simplistic model based in Darwinian thought that emphasized stress and control in the animal world (Lazarus & Folkman, 1984). Lazarus & Folkman, (1984) argued that the stress/control model did not adequately account for "the cognitive-emotional richness and complexity that is an integral part of human functioning" (p. 118).

The transactional model is now considered a foundational theory for many researchers in the area of stress and coping. The model suggests that individuals select coping behaviors based on the combination of available personal resources and situational demands. Coping has been defined as an individual's attempt to overcome the challenges brought on by the person-environment relationship (Folkman & Lazarus, 1985; Scherer & Drumheller, 1990). Additionally, the transactional model does not view coping as a trait but rather a series of transactions between person and environment.

Threatening events in the environment cause a stress response in the person. This response is explained as a series of psychological and physiological reflexes that are engaged by the perceived danger in the environment (McCarthy et al., 2002). This type

of interplay between the environment and the person's reactions was probably quite adaptive for humans thousands of years ago. However, it could be argued that current environmental stressors may not warrant the same kind of stress response that was integral for survival in more primitive societies (McCarthy et al., 2002). Furthermore, McCarthy, Lambert, & Brack (1997) suggested that sufficient levels of coping resources cause the individual to perceive fewer threats in the environment, thereby reducing the necessity for a stress response. Associations between elevated stress and poor health behaviors have been documented (Ng & Jefferey 2003).

An interesting addition to the research on coping concerns the discussion of coping methods as having a direct effect, which assumes that the coping resource (eg. Self-efficacy) would have a positive impact on psychosocial functioning regardless of the presence of stress (as cited in Penninx et al., 1998). The competing theory is the buffering effect of coping resources (as cited in Penninx et al., 1998) which suggests that coping resources have a mollifying effect upon stressors.

Matheny, Aycock, Pugh, Curlette, and Canella (1986) suggested that much of the current research on stress and coping focused on combating stress already present in an individual's life. They further noted that there is a relative paucity of research that examines strategies for preventing stress from occurring in the first place. Through this line of inquiry, Matheny et al. (1986) proposed a stress and coping model that identified resources that are effective at both preventing and combating stress.

Preventing and combating stress are central to the DIGMA intervention. All of the subjects are veterans, many of whom have experienced armed combat and suffer from long-term stress-related disorders. The concept of stress and its impacts upon blood

pressure are made implicit at the outset of the DIGMA and are discussed repeatedly over the course of the program. The details of this process will be explained in the Method section. Techniques for coping with stress are discussed and alterations to current maladaptive coping strategies are suggested and followed up on at subsequent meetings.

Purpose

The primary purpose of this dissertation is to investigate whether there is a significant impact of a novel behavioral health intervention, the DIGMA, upon individuals with HTN as demonstrated by measurable changes in blood pressure and self reported modifications in health practices and beliefs. Psychosocial correlates to the adoption of proposed health promoting behaviors will be examined. These are self-efficacy specific to HTN and health related locus of control.

In addition to the blood pressure readings and self report measures, qualitative information will also be sought from participants. This qualitative component will serve as an informal evaluation of the DIGMA program, eliciting suggestions for improvements and further development of the intervention. The qualitative component should also aid in understanding, from the perspective of the participants, to what they attribute behavior and health changes. Some of the questions were designed to address self-efficacy and locus of control beliefs (See Appendices E & F) while others addressed readiness for change in behavior (Prochaska & Norcross, 2001).

The DIGMA is an ongoing medical program in place at the AVOC. It was developed to improve the efficiency of care provided to hypertensive patients and

introduce the possibility of self-initiated health-behaviors. This dissertation will serve as an evaluation that will hopefully shed light on the progress towards these goals.

An investigation concurrent to the present study (mentioned above), will also examine the utility of the DIGMA program. That investigation, undertaken by the DIGMA co-leader, will focus on measures of stress and coping and their relationship with adopted health behaviors.

The research upon which both of the above mentioned dissertation studies are based is exploratory. The standard of care for HTN patients in the VA is based on findings from major national studies with samples in the thousands. In order to propose a change in this standard, and in so doing influence a shift in the paradigm of primary healthcare, some compelling justification is warranted. These dissertation studies intend to provide that justification utilizing a mixed methods design looking at cognitive, behavioral, and biological factors.

Research Questions

1. How does participation in the DIGMA impact the stability of participants' blood pressure? This question will be addressed by comparing systolic and diastolic blood pressure at pretest to systolic and diastolic blood pressure at posttest.
2. Will the DIGMA intervention have a positive impact on perceived HTN self-efficacy? This question will be addressed by comparing hypertension self-efficacy scores at pretest to hypertension self-efficacy at posttest.
3. What is the relationship between DIGMA participation and subsequent adoption of health promoting behaviors? This question will be addressed by comparing

pretest health promoting behavior scores to posttest health promoting behavior scores.

4. How will the DIGMA impact participants' health locus of control? This question will be addressed by comparing health locus of control scores at pretest with health locus of control scores at posttest.

In developing the above questions it was clear that treating time as the independent variable and either blood pressure or psychosocial variables as dependent variables was appropriate as the initial point of the study was to determine the effect of the DIGMA program on its participants. After asking these questions an additional curiosity arose regarding the varying degree of change to be expected from the range of participants. Therefore, the next questions look at the pretest scores of selected psychosocial measures as independent variables. The underlying thought upon which these additional two questions were formulated was whether certain beliefs at the beginning of the program would have an impact upon the overall impact of the program as it is measured by changes from pretest to posttest. Thus the following questions were formulated:

5. What is the relationship between baseline levels of perceived self-efficacy specific to HTN and adoption of new health promoting behaviors? This question will be addressed by creating two groups of participants formed based upon their pretest scores on the hypertension self-efficacy measure, categorizing them as

either low or high. Then, the low and high groups will be examined separately for changes in health promoting behavior scores from pretest to posttest.

6. What is the relationship between internal health locus of control at pretest and the adoption of new health promoting behaviors? Similar to question 5, this question will be addressed by first creating two groups of participants based upon their pretest scores on the locus of control measure. Participants will be placed into either the low internal locus of control group or the high internal locus of control group. Then each of these groups will be examined separately for changes in health promoting behavior scores from pretest to posttest.

7. Qualitative questions – Semi-structured interview questions were designed to elicit the experiences of DIGMA participants as well as those who were unable to complete the program. Questions about what they liked and disliked about the program are to be used for further development of the DIGMA. Each participant was contacted within 2 weeks of completing the program. Three participants were not reachable. (See Appendices E & F for interview questions).

CHAPTER 3: METHOD

PARTICIPANTS

Participants consisted of patients of the AVOC who have been identified by primary care as having HTN. HTN is a pervasive chronic health complaint with 37% of the entire VA patient population struggling to manage blood pressure in 1999 (Yu et al, 2003). As such, the pool of potential participants was large. Since each DIGMA group should have been no larger than 15 people, it had been necessary to conduct the DIGMA several times with different groups.

There was no exclusion of any racial or ethnic group in the recruitment of participants for this study. Recruited participants were military veterans who have HTN as diagnosed by AVOC medical personnel. Because of the high percentage of men receiving care from the AVOC, the entire sample of study participants were men. Additionally, it was necessary to screen 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 1 disorders as defined by the Diagnostic and Statistical Manual of Mental Disorders vol. 4-text revision (DSM-IV TR). The psychological diagnoses selected for exclusion were dementia, schizophrenia, and schizophrenia related disorders as well as dissociative disorders and mental disorders due to a general medical condition. In addition, other psychological exclusionary criteria included a diagnosis of any Axis II disorder as defined by the DSM-IV TR. A review of patient medical files was used in the

assessment these exclusionary criteria and approximately 6-8% of potential participants were excluded by this process.

It was desirable to ensure that those who agreed to join the DIGMA would be able to attend all sessions. Individuals without a permanent residence were excluded. Those unable to speak, read, and write in English were also excluded.

From August 2006 when the study was initiated through February 2007, 73 individuals entered the study. Of these, 58 completed pretest measures, participated in the DIGMA program, and completed posttest measures.

Patient Recruitment

Patients at the AVOC who met criteria for HTN were considered for this study. A list of veterans with elevated blood pressure readings was provided to the researchers. From this list, examination of each of the potential candidates' medical records helped determine program eligibility.

A primary care physician at the AVOC provided the initial patient diagnoses of HTN. Primary care staff presented to the researchers the names of prospective participants diagnosed with HTN. Medical files were consulted for additional diagnostic information. This information assisted in identifying qualifying participants by providing previously described exclusionary criteria. One month prior to the group medical appointment, potential participants were contacted in order to inform them about the study. Prospective subjects were informed that participation would be completely voluntary, and that standard care through the AVOC would not be impacted by their choice to participate. However, benefits of attendance were explained. Specifically, that

this medical appointment would not take the place of regularly scheduled appointments; rather, it would serve as an adjunct encounter with the primary healthcare team. Additional access to a pharmacist and behavioral health care staff was also noted. At this point, potential participants would essentially self-select for inclusion in the program. They would consider the given explanation of the DIGMA and determine whether or not the proposed healthcare interface (specifically a group appointment), would fit with their needs. They also had the opportunity to determine whether they felt they needed additional assistance with the management of their HTN symptoms.

If, through this initial telephone contact, potential participants expressed a desire to participate, primary care staff were provided with prospective attendee information in order to enroll the individual. Enrollees received confirmation via US mail regarding registration in the DIGMA. This appointment confirmation included the date, time, and location of appointments as well as clinic contact information.

In addition, some participants were referred to the program directly from their primary care physician. In these cases, telephone recruitment did not occur.

Informed Consent

Enrolled participants were asked to come into the clinic prior to the first scheduled appointment in order to read and sign a consent form. At this point, the researchers answered any questions so that the participants could be fully informed of procedures and inherent risks of the study prior to participation. It is important to note that by giving consent, participants authorize researcher to have 1) follow-up phone contact, and 2) access to their medical records for a five-year period. After the

participants read the consent form and have all of their questions answered, they were asked to sign and date the consent form. A witness then signed the form to confirm that the participant had read and signed the consent form. Informed consent forms were approved by the Institutional Review Boards at both the VA and the University of Texas at Austin.

CONTENT OF INTERVENTION/DATA COLLECTION

Straying somewhat from the "drop-in" model set forth by Noffsinger (1999) the AVOC model is a 3-session DIGMA to which has been added an "orientation meeting" one week prior to the intervention for informed consent and pretest measures. Telephone interviews were conducted approximately one week after the fourth and final DIGMA meeting. This last contact allowed for qualitative information to be included in the study.

Typically 10-15 veterans were registered to participate in a DIGMA. Over the course of the intervention the specific topics covered were medication, nutrition, exercise, and stress management. It was expected that those patients who began with the first session would continue to attend the weekly appointments through the fourth week.

Throughout the program, facilitators encouraged group members to ask questions of available providers as well as share ideas and experiences with other members. This effort often had the effect of creating greater comfort and openness among group members and resulted in some fairly lively discussion, which is usually rare in a typical classroom setting. Facilitators also provided behavioral suggestions for the management of stress and anxiety.

The investigators have collaborated with VA Psychology Service and primary care providers over the past year to create a Doctor Interactive Group Medical Appointment (DIGMA) that addresses the specific needs of veterans with HTN. As such, the DIGMA at the AVOC is facilitated by the researcher and another doctoral student in Counseling Psychology who also participated in data collection on this project, supervised by VA staff psychologists. Facilitators directed conversation, introduced new topics, and mediated sharing between participants. The content of the DIGMA was fairly specific with information to be imparted in each of three group meetings. However, in line with the typical psychotherapeutic group format, there was time for deviation from the content in order to attend to group process. The leaders attempted to generate a sense of connection among group members to facilitate sharing and a sense of belonging within the group. Staff psychologists and primary care oversaw the DIGMA process. The DIGMA took place in a conference room on Wednesday mornings from 10:30am until noon. Following is an overview of the content of each DIGMA meeting.

Meeting 1 – Orientation (Pretest)

In order to take part in this research study, members were required to attend an initial orientation meeting. This appointment acted as an introduction session to the program where the group facilitators explained informed consent and introduced confidentiality concerns. Facilitators were available to answer any questions regarding the program. After reading and signing the applicable consent forms, the participants filled out the demographic inventory and the pretest questionnaire packet. To guarantee the confidentiality of each participant, ID numbers were utilized to organize self-report

and physiological data. All data and medical files are kept confidential by the established standards and practices of the AVOC.

Meeting 2 – Stress Management

At the beginning of the first session, participants 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. Participants then submitted to the first of two blood pressure readings performed by a registered nurse. Participants were then introduced to group facilitators and other staff members. At this point group leaders reminded members that the meetings are considered a medical appointment and that confidentiality is imperative. The first activity was to participate in an introduction exercise where group members meet and introduce one or more of their neighbors. This serves the added purpose of building relationships among participants and facilitators. Program goals were then discussed. This discussion focused upon the anticipated shift in thinking, linking new health promoting behaviors to effective management of HTN. Of particular interest was learning how to manage emotional stress and becoming more aware of the importance of nutrition maintenance. Other topics of discussion included understanding the effectiveness of moderate physical exercise as well as understanding the importance of prescription medication adherence. A blood pressure log and a personal blood pressure monitor were provided. This equipment was used to help individuals learn to monitor their blood pressure on a regular basis.

The emphasis for this meeting was stress management. Facilitators attempted to elicit group dialogue related to stress by providing examples that illustrated associations

between emotional stress and physiological well-being. Examples of stressful events were elicited from members' as well as their relative successes at handling stress. Specific definitions of the physiological components of stress were given and members were asked to reflect upon their stress and its impact upon their physiological health. The group leaders attempted to foster discussion geared towards discovering new ways in which to manage emotional stress.

During each meeting, a primary care provider conducted pull-out meetings with group members' whose initial blood pressure reading demonstrated a lack of stability. In these pull-out meetings the provider discussed the individual's case and may have prescribed a medication change. Towards the end of the meeting, each of the participants had their blood pressure measured for a second time.

Messages of taking responsibility for health by altering behavior were introduced and woven through the entire intervention. Additionally, over-reliance on the medical community was discussed, implanting the idea that the patient is the ultimate expert on his health.

Meeting 3 - Nutrition

Following check in with the group facilitators, each participant submitted to a blood pressure reading to be performed by a registered nurse. Group facilitators began by welcoming participants back to the program. Participants were reminded of the necessity for confidentiality in order to continue participation.

The prior week's topics were reviewed and participants were invited to share any thoughts regarding the previous meeting. Members may have been asked about any

attempts at implementation of previously suggested interventions. Nutrition awareness was introduced. Materials presented suggested the strong link between nutrition and HTN. Facilitators introduced the impact of weight control on health. Discussion regarding difficulties in successfully managing weight was encouraged. For example, the concept of eating for comfort was discussed. Members were asked for their own examples of food that they enjoy, knowing that it might not be the healthiest choice. Portion size and nutritional content were discussed in detail with members providing their own experiences and suggestions. Nutritional information was based upon information received from a consultant nutrition specialist. Group facilitators provided basic information regarding daily dietary guidelines. This information included reading and understanding food labeling, avoiding prepackaged food and awareness of sodium, sugar and fat content. Information concerning different types of fats (saturated vs. unsaturated vs. trans fats) was made available. Members were invited to ask questions and make suggestions to other group members struggling with changing their eating habits. It is important to note that group discussion may have originated from, but was not constrained by these specific nutritional matters. Participants were encouraged to explore other areas of nutritional concern.

As in the first intervention meeting, primary care conducted pull-out meetings with members whose initial blood pressure reading is high. Changes may have been made to medication and suggestions for behavior changes may have been offered.

Towards the conclusion of this meeting, participants were reminded that the upcoming final appointment would cover medication compliance and physical exercise. Participants were invited to bring in their questions regarding their medications to the

staff pharmacist during this final group gathering. It was also suggested that participants bring in their prescribed HTN medications to facilitate discussion of specific medications and their potential side effects. Prior to leaving this meeting, each of the participants had another blood pressure reading.

Meeting 4 – Exercise, Pharmacy (Posttest)

At initiation of the final program meeting, a registered nurse performed an additional blood pressure reading on each participant. Following the pattern of the preceding meetings, group facilitators welcomed the returning members and reminded them of the confidentiality agreement. The final session focused on medication adherence and exercise.

Topics from the previous meetings were revisited and members were asked to share their experiences with any changes they had attempted. The topic of medication began with the introduction of a staff pharmacist who invited discussion and answered any questions related to medication as well as the efficacy of mixing different medications to achieve a desired result. The pharmacist discussed the importance of taking blood pressure medication as prescribed. Reporting of adverse side effects to primary care staff was recommended. Facilitators engaged the group (including the pharmacist) in discussion about individual experiences with different medications and potential side effects.

Facilitators then shifted the focus to the benefits of physical exercise, another behavioral component to health. Links between cardiovascular health and exercise were explored. Group members were encouraged to discuss their views and practices

regarding exercise. Discussion allowed members to explore techniques that can help them increase their daily exercise. The importance of safely incorporating physical activity into one's daily routine was emphasized. In order to illustrate increased awareness of physical activity, group leaders discussed the application and usage of pedometers to the group members.

Primary care conducted its pull-out meetings and made changes as needed based on initial blood pressure readings. Before the session concludes, each of the participants had another blood pressure reading performed by a registered nurse.

This last group meeting acted as the final program intervention. It was slightly shorter than the previous two meetings to make time for post test measures. At the end of this appointment, participants were asked to complete post test measures.

In parting, group members were reminded about available resources and encouraged to take more responsibility for their health rather than to rely solely on the medical community and pharmacological interventions. Throughout each of the three sessions, group leaders integrated messages of stress management, social support, and personal control over behavior through group process. Group participants were encouraged to experiment with suggested changes between sessions and then report their findings. Since it is a goal to encourage change in health related behavior it should be noted that the effect of the group format itself has been implicated as an agent of such positive changes in behavior (Kivlighan, Multon, & Brussart, 1996; Moffett & Stoklosa, 1976).

Qualitative Interview

One week following the final group meeting, DIGMA enrollees, including both graduates and dropouts were contacted via telephone for a 10-15 minute open-ended interview. (See instruments section for script) The purpose of this telephone contact was to qualitatively assess the efficacy of the DIGMA program. Open-ended questions were designed to illuminate the strengths and weaknesses of the program from the perspective of both program graduates as well as dropouts. Literature on stages of change was consulted to construct questions for both graduates and dropouts (Prochaska & Norcross, 2001). Of particular interest from program graduates are cognitive changes that may have occurred as a result of participation in the DIGMA. Of interest from program dropouts will be their reason for discontinuing the program and whether they felt the meeting(s) they did attend were of any value to them. Data collected from this process will be utilized for program improvement and development. Approximately 95% of program graduates and dropouts were available to conduct the telephone interview.

INSTRUMENTS

Demographic Information

Demographic information was obtained via a self-report inventory. This inventory included questions about participant's age, weight, ethnicity, marital status, employment status, occupation, household income, educational background, exercise regimen, diet, history of drug, alcohol and tobacco use, medical history, current use of medications, and sleep patterns. (See Appendix A)

Hypertension Self-Efficacy Scale (HypSE)

The HypSE is a 13-item instrument that was altered and renamed specifically to fit the needs of this study. Originally, the CardSE was designed to measure expectations of self-efficacy related to the management of cardiac symptoms (Sullivan, LaCroix, Russo & Katon 1998). The original CardSE scale was altered for this study by changing the words chest pain, heart disease and cardiac to reflect situations relating to HTN (i.e. HTN, high blood pressure). Two questions were changed because they were redundant for HTN sufferers. One question was changed to reflect the dietary changes recommended to HTN sufferers.

Patients were asked to rate their confidence with knowing or acting upon each of the 13 statements on a 5 point Likert scale (0 = not at all confident, 1 = somewhat confident, 2 = moderately confident, 3 = very confident, 4 = completely confident). Sullivan et al (1998) analyzed the original measure by subjecting the items to a principal components analysis that yielded two orthogonal factors, explaining 66.7% of item variance. The two factors are: maintain function (MF) and control symptoms (CS). Both showed high internal consistency and discriminant validity for the original CardSE scale. Cronbachs alphas were 0.90 for CS and 0.87 for MF. The subscales were moderately correlated with one another (r = 0.38). To determine convergent and discriminant validity, Sullivan, et al (1998) examined correlations of the scales with patient demographics, physical status, physical functioning, disability, distress, personality and Jenkins Self-efficacy Scales (Gortner, 1990). CardSE scales were found to be unrelated to physical status and demographics. Both CardSE scales were significantly related to the Harm Avoidance subscale of the Tridimensional Personality Questionnaire (TPQ)

(Cloninger, 1987). Patients with more self-efficacy scored lower on harm avoidance. Distress was significantly related to both CardSE scales. Patients with higher self-efficacy rated as significantly less depressed or anxious. The CardSE – MF subscale was related to both baseline and 6 month follow up physical functioning. This finding may indicate the validity of the measure. Patients with higher self-efficacy reported better physical functioning. This same relationship was not significant with the CS subscale. The CardSE – CS was only significantly related to the 6 month interference with family/home. More self-efficacy was related to less disability at 6 month follow up. For the CardSE – MF scale 6 month interference with social activities and both baseline and 6 month follow up disability with respect to family and home were significant. Thus, more disability was associated with less self-efficacy. The CardSE – MF and CS subscales were significantly correlated to both Jenkins Self-efficacy Scales. This finding may demonstrate the validity of the measure (Sullivan et al, 1998).

The HypSE, adapted from the CardSE described above, employs a minor alteration of the original items from the CardSE. However, the HypSE is being utilized as an overall measure of self-efficacy specific to hypertension, and was not broken down into subscales. The logic here being that while the concepts of self-efficacy to manage both heart disease and hypertension are similar, the diseases themselves have qualitative differences. Specifically, that controlling symptoms and maintaining function (the two subscales of the CardSE) are not as distinct for hypertension and thus may not create two distinct factors. Also, the three questions that were added to make the measure more applicable to HTN patients would undoubtedly alter its psychometric properties with regard to the factor analysis referenced above. Given the sample and the changes from

cardiac symptoms to hypertension symptoms, it is possible that a single factor solution would be supported. Unfortunately, this theory cannot be tested with the size of the given sample. Cronbach's alpha for the HypSE, revised specifically for this study, was found to be (0.90).

(See Appendix B)

HypSE scores indicate an individuals beliefs about their ability to manage blood pressure concerns, thus, higher scores on this measure are preferable. The HypSE employs a 5 point Likert scale. It is scored by summing the item scores for the entire measure.

Health Promoting Lifestyles Profile II (HPLP II)

The HPLP II (Walker, Sechrist & Pender, 1995) measures the frequency of respondents' engagement in health-promoting behaviors utilizing a 4-point Likert format (1 = never - 4 = routinely). This instrument has been used extensively to assess behaviors intended for decreasing the impact of illness and promoting wellness. Higher scores will indicate higher frequency of health-promoting behavior. Items comprise six subscales: Health Responsibility, Physical Activity, Nutrition, Spiritual Growth, Interpersonal Relations, and Stress Management. Items from each subscale are distributed throughout the instrument. The HPLP II is based on the HPLP (Walker, Sechrist & Pender, 1987). The subscale, Spiritual Growth, deals with the development of internal resources and is achieved through transcending, connecting, and developing (as cited in Walker & Hill-Polerecky, 1996). It was determined for the purpose of this study that the Spiritual Growth subscale would be omitted both due to content and in the interest of time. The

Interpersonal Relations subscale examines the degree to which an individual utilizes communication to attain meaningful intimate relationships with others (as cited in Walker & Hill-Polerecky, 1996). Nutrition entails the thoughtful selection and consumption of foods known to be beneficial to health and well-being (as cited in Walker & Hill-Polerecky, 1996). The Physical Activity subscale looks at an individuals' participation in light to moderate and/or vigorous exercise (as cited in Walker & Hill-Polerecky, 1996). The Health Responsibility subscale monitors the degree to which an individual feels a sense of accountability or responsibility for his or her own health and well-being. The Stress Management subscale examines the ability of an individual to identify and activate coping resources in the face of stressful situations in order to reduce their impact (as cited in Walker & Hill-Polerecky, 1996). It was determined for the purposes of this study that the Stress Management subscale would be omitted in favor of a separate measure of perceived stress. Thus, the total items from the HPLP-II were reduced from the original 52 to the revised 35.

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 (which is not being used in this study). Reliability of the included subscales of the HPLP II was established with Cronbach's alphas as follows: Health responsibility, 0.86; Physical activity, 0.85; Nutrition, 0.80; Interpersonal relationships, 0.87 (Walker, Sechrist, & Pender, 1995).

(See Appendix C)

For HPLP-II subscale scores, higher numbers equate to a greater amount of health promoting behaviors. Thus, higher scores are preferable. The HPLP-II subscales

include: interpersonal relations, physical activity, nutrition, and health responsibility. The HPLP-II employs a 4 point Likert scale. It is scored by summing the items in each subscale and taking the average.

Multidimensional Health Locus of Control (MHLC)

The Multidimensional Health Locus of Control Scales (Wallston, Wallston, & DeVellis, 1978) measures an individual's location of control over health-related concerns. Originally it was conceptualized that locus of control existed along a continuum with internal (I) or external (E) at the anchors. More recently this theory has been revised to suggest that these two belief orientations are independent of one another (Luszczynska & Schwarzer, 2005). Thus the most recent version of the MHLC measures three subscales of locus of control which are: Internal Health Locus of Control, Chance Health Locus of Control, and Powerful Others Health Locus of Control. Each of these subscales is measured independently of one another.

The MHLC is an 18 item, Likert-type instrument. The Internal Health Locus of Control (I) scale illuminates the extent to which an individual perceives that his or her behavior has an impact on his or her health. The Internal scale is comprised of items such as, "If I take care of myself, I can avoid illness." The Powerful Others Health Locus of Control (E) scale indicates the belief that health is determined by the interventions of 'powerful others' such as family, friends, or health providers. This scale is comprised of items such as, "When I recover from illness, it's usually because other people (for example, doctors, nurses, family, friends) have been taking good care of me." The Chance Health Locus of Control (E) scale examines to what degree an individual believes

that his or her health is the result of fate or chance. This scale is comprised of items such as, “Luck plays a big part in determining how soon I will recover from an illness.”

Wallston et al. (1978) report coefficient alpha for the three subscales of 0.86, 0.83, and 0.84 respectively. The three subscales demonstrated low intercorrelation, which suggests that different constructs are being measured.

The MHLC has continued its development since its original form (Wallston et al., 1978). Forms A and B, the original scales are thought to address control of ones health status while form C addresses beliefs about the sense of control over ones illness or disease. Cronbach’s alpha for the three subscales were: Internal (0.88); Chance (0.70); and Powerful Others (0.55). Confirmatory factor analyses performed on this measure tended to demonstrate only a marginal fit for a three factor structure with the Chance subscale causing the fit problems (Hubley & Wagner, 2004). Additionally, Internal and Powerful Others health locus of control were found to be uncorrelated with one another (r = .12); Powerful Others and Chance health locus of control were weakly correlated with one another (r = .20); and Internal and Chance locus of control were weakly negatively correlated (r = -.29) (Wallston, 2005). Also, Internal health locus of control was positively correlated (r = .40) with a measure of health status (Wallston, 2005).
(See measure in Appendix D)

The MHLC is comprised of three subscales. Internal health locus of control is considered adaptive so higher scores on MHLCint subscale are considered preferable. Chance and powerful others health locus of control are less adaptive so higher scores on those subscales are less preferable. The MHLC employs a 6 point Likert scale. It is scored by summing the items in each subscale.

Telephone Interview

Script: "Hello, this is _____from the VA in Austin. I'm calling to ask a few questions about your experience with the DIGMA hypertension group. Do you have a few minutes?"

(See Appendices E and F for interview questions)

APPARATUS

Automated Heart Rate and Blood Pressure Cuff

The participants' blood pressure and heart rate were calculated in the clinic 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).

Blood pressure numbers are a common aspect of a patient's medical records. Throughout the DIGMA program blood pressure was measured at intervals. Typically, this occurred once at the beginning of a meeting and once towards the end. It is the duty

of primary care to note and enter blood pressure readings into the patients' medical records.

In order to obtain pretest blood pressure data, it was determined that the reading recorded just prior to the patients' referral/recruitment to the DIGMA would be selected. Readings included as posttest data consisted of the last recorded blood pressure taken on the final day of the DIGMA program. This technique of obtaining pretest and posttest blood pressure readings applies to participants who completed the entire program. While it was preferable to utilize this standard format for our analysis of blood pressure numbers, there were occasions of irregular recordings due to changes in providers. It was also possible to collect blood pressure data from the 16 individuals who dropped out of the program. With this subgroup, pretest blood pressure was obtained using the same method as above; readings just prior to referral/recruitment were entered as pretest. For posttest blood pressure, the researchers attempted to replicate the time period of the DIGMA, searching patient records for the blood pressure reading closest to the final DIGMA meeting for their cohort. While this data were available, they are not reported on in this study.

For biological measures of systolic blood pressure (SBP) and diastolic blood pressure (DBP), higher numbers equate to greater amount of pressure in the vascular system. Therefore, lower numbers are preferable.

Hypotheses

Posttest systolic blood pressure (PostSYS) will be measurably lower than pretest systolic blood pressure (PreSYS). Those rating themselves low on the HTN self-efficacy

measure at pretest (HypSEpre) will exhibit lesser improvement in measures of health behavior (hplpIR; hplpPA; hplpNu; hplpHR) than those who rate themselves higher on self-efficacy at pretest (HypSEpre). It is also hypothesized that levels of HTN self-efficacy will be increased as a result of the intervention such that an individual with low HTN self-efficacy at the initiation of the study will have measurably higher HTN self-efficacy at the termination of the study (HypSEpost > HypSEpre). This hypothesis suggests that participation in the DIGMA program will have a positive effect upon an individuals' sense of HTN self-efficacy. It is also anticipated that DIGMA participation will result in positive change in health promoting behaviors from pretest to posttest (hplpIRpre < hplpIRpost; hplpPApre < hplpPApost; hplpNupre < hplpNupost; hplpHRpre < hplpHRpost).

Participants' health locus of control is also anticipated to be impacted by DIGMA participation. The Internal subscale of the MHLC will be higher at posttest (mhlcintpre < mhlcintpost). Both Chance and Powerful Others subscales are expected to be reduced by DIGMA participation (mhlcchncpre < mhlcchncpost; mhlcpowpre < mhlcpowpost). Also, it is anticipated that those endorsing a higher internal locus of control at pretest (mhlcintpre) will more readily adopt health promoting behaviors (hplpIR; hplpPA; hplpNu; hplpHR) as a result of the DIGMA intervention.

Overview of Research Questions

Prior to reviewing the study's findings, a brief explanation will be provided regarding the manner in which the results will be presented. First, research questions will be reviewed and statistical procedures relating to each question will be addressed.

1. How does participation in the DIGMA impact the stability of participants' blood pressure? This question will be addressed by comparing systolic and diastolic blood pressure at pretest to systolic and diastolic blood pressure at posttest. This question will be addressed with two paired T-Tests to determine significant changes from pretest to posttest.
2. Will the DIGMA intervention have a positive impact on perceived HTN self-efficacy? This question will be addressed by comparing hypertension self-efficacy scores at pretest to hypertension self-efficacy at posttest. This question will be addressed with a paired T-Test to determine significant changes from pretest to posttest.
3. What is the relationship between DIGMA participation and subsequent adoption of health promoting behaviors? This question will be addressed by comparing pretest health promoting behavior scores to posttest health promoting behavior scores. While this question could be addressed by a paired T-test, it is being addressed as part of questions 5 and 6 by utilizing a repeated measures MANOVA. This procedure will allow us to determine if significant changes in Health Promoting Behavior from pretest to posttest exist and if so, whether they are associated with either level of pretest Hypertension Self-efficacy (as in question 5) or levels of pretest locus of control (as in question 6).
4. How will the DIGMA impact participants' health locus of control? This question will be addressed by comparing health locus of control scores at pretest with health locus of control scores at posttest. This question is being addressed by

running paired T-tests on each of the three MHLC subscales to determine whether significant changes exist between pretest and posttest.

5. What is the relationship between baseline levels of perceived self-efficacy specific to HTN and adoption of new health promoting behaviors? This question will be addressed by creating two groups of participants formed based upon their pretest scores on the hypertension self-efficacy measure, categorizing them as either low or high. Then, the low and high groups will be examined separately for changes in health promoting behavior scores from pretest to posttest. To address this question pretest scores on the HypSE were subjected to a median split. This allowed participants to be placed into either the low self-efficacy subgroup (HypeSE scores < 45.5) or the high self-efficacy subgroup (HypSE scores > = 45.5). Next, the low and high pretest HypSE scores, and the HPLP-II pretest and posttest scores were entered into a repeated measures MANOVA. This procedure tested the existence of significant differences between the low and high HypSE groups; it tested for the existence of significant differences in pretest and posttest scores of the 4 subscales of the HPLP-II; and it tested for associations between changes in HPLP-II scores from pretest to posttest and HypSE subgroup membership.
6. What is the relationship between internal health locus of control at pretest and the adoption of new health promoting behaviors? Similar to question 5, this question will be addressed by first creating two groups of participants based upon their pretest scores on the locus of control measure. Participants will be placed into either the low internal locus of control group or the high internal locus of control

group. Then each of these groups will be examined separately for changes in health promoting behavior scores from pretest to posttest. To address this question pretest scores on the internal subscale of the MHLC were subjected to a median split. This allowed participants to be placed into either the low internal locus of control subgroup (MHLCint scores < 27.5) or the high internal locus of control subgroup (MHLCint scores > = 27.5). Next, the low and high pretest MHLCint scores, and the HPLP-II pretest and posttest scores were entered into a repeated measures MANOVA. This procedure tested the existence of significant differences between the low and high MHLCint subgroups; it tested for the existence of significant differences in pretest and posttest scores of the 4 subscales of the HPLP-II; and it tested for associations between changes in HPLP-II scores from pretest to posttest and MHLCint subgroup membership.

CHAPTER 4: RESULTS

This section will present the results of the current study. First, descriptive data is calculated and will be reviewed for all major variables included in this study at both pretest and posttest. Then, bivariate correlations are calculated and reviewed in order to ascertain the relationship of the study variables to one another in this sample. Finally, results of the primary and secondary analyses will be presented.

Overview of Analyses

Primary analyses comprise the calculation and review of six paired sample T-tests. The first two paired sample T-tests will compare systolic and diastolic blood pressure readings from pretest to posttest to determine if significant changes are detected. The third paired T-test will compare levels of HTN self-efficacy from pretest to posttest to determine if significant changes are detected. The fourth paired T-test will compare MHLC-internal subscale scores from pretest to posttest to determine if significant changes are detected. The fifth paired T-test will compare MHLC-chance subscale scores from pretest to posttest to determine if significant changes are detected. The sixth paired T-test will compare MHLC-powerful others subscale scores from pretest to posttest to determine if significant changes are detected. A Bonferroni correction technique will be employed to account for the inflation of error that may result from repeated tests.

Secondary analyses are based on an additional exploration into relationships between psychosocial measures and their impact on the adoption of new health behavior. As stated earlier, interest in treating baseline levels of self-efficacy and locus of control

as independent variables was generated after considering the primary analyses. The underlying assumption was that an individuals' self-efficacy and/or locus of control beliefs at the beginning of the study may have had some impact upon how well they were able to implement the behavior changes brought about in the DIGMA. Secondary analyses are in no way contingent upon the results of the primary analyses. Secondary analyses will treat pretest HypSE, pretest MHLCint as independent variables by dichotomizing them. Time will also be an independent variable. HPLP-II scores will be dependent variables. These analyses will consist of two repeated measures MANOVA's.

The first repeated measures MANOVA will examine whether significant changes in health promoting behavior from pretest to posttest are detected as measured by the Interpersonal Relations, Nutrition, Physical Activity, and Health Responsibility subscales of the HPLP-II, and if so, are these changes related to pretest level of HypSE. Changes on subscales of the HPLP-II are viewed as the dependent variables. Independent variables are time as the within subjects factor and pretest HypSE scores dichotomized into high HypSE and low HypSE as the between subjects factor.

The second repeated measures MANOVA will examine whether significant changes in health promoting behavior from pretest to posttest are detected, as measured by the Interpersonal Relations, Nutrition, Physical Activity, and Health Responsibility subscales of the HPLP-II, and if so, are these changes related to pretest levels of internal health locus of control, as measured by the internal subscale of the MHLC. Again, changes in HPLP-II scores will be viewed as dependent variables. Independent variables are time as the within subjects factor and pretest MHLCint scores dichotomized into high MHLCint and low MHLCint as the between subjects factor.

Due to the nature of this study, participants who experienced the DIGMA intervention did so in a group. Thus, their experiences of the DIGMA were dependent upon the influences and experiences of the other group members. This would constitute a violation of the Independence Assumption, which is considered to be of extreme importance when interpreting statistical findings (Murphy & Johnson, 2006). Therefore, any and all results presented above should be interpreted with extreme caution.

Data Analysis

DESCRIPTIVE DATA

Descriptive data from the demographic questionnaire is presented in table 1a. Descriptive statistics for psychosocial and blood pressure variables is presented in table 1b for pretest values and 1c for posttest values. For all scores included in the psychosocial variables, higher scores indicate a greater presence of the variable being measured. In the cases of systolic and diastolic blood pressure, guidelines have been established for optimal levels. Systolic blood pressure of 120 mm Hg or lower and diastolic blood pressure of 80 mm Hg or lower are considered optimal for health (JNC, 2003). Descriptive data presented in the tables below include means, standard deviations, and minimum and maximum values.

Data were collected from seven distinct DIGMA groups taking place over a seven-month period. 73 patients entered the study; 58 patients completed the study, thus final N = 58. The sample was 100% male with an average age of 65.8 years. Ethnic makeup was 51% white, 26% African American, 19% Latino, and 3% fell into the

"other" category. 65.5% of the sample were married, 24.1% were divorced, 6.9% were single, and 3.4% were widowed. 65.5% of the sample were retired, 19% worked full time, 6.9% worked part time, and 8.6% were not working at the time of data collection. Mean income for the sample was between $30,000 and $44,999 per year. 39.7% of the sample had completed high school, 24.1% had completed an undergraduate degree, 20.7% had attended community college, 8.6% had attained some sort of graduate degree, and 6.9% had completed grade school.

Pretest blood pressure was measured in the clinic at least 1 month prior to the start of the DIGMA. These pretest blood pressure readings were often the reason for recruitment or referral to the DIGMA. Posttest blood pressure was recorded on the last day of the DIGMA, concurrent with posttest paper and pencil measures. An average, mean systolic blood pressure (SBP) at pretest was (M = 154.93), reducing to (M = 134.45) at posttest. Mean diastolic blood pressure (DBP) at pretest was (M = 78.4), reducing to (M = 68.72) at posttest. Optimal blood pressure has been defined as lower than 120/80 mm Hg and blood pressure above 140/90mm Hg is considered to be high risk (JNC, 2003).

DATA EXAMINATION

Missing data from both pretest and posttest on the HPLP-II and MHLC were handled by substituting a subjects' average score on the subscale that contained the missing data point. On both pretest and posttest of the HypSE, missing data were replaced by an average of the two points on either side of the missing data point for individual subjects.

OUTLIERS

Outliers have been categorized as scores that fall at least three standard deviations above or below the mean (Clark, 2007). Pretest and posttest scores of each of the psychosocial variables and blood pressure were converted to standard scores. These standard scores were then examined for outliers. Three were found. One subject endorsed the HypSE posttest such that his scores fell three standard deviations below the mean. This score would have the effect of bringing the mean of the HypSE posttest down, possibly under-representing the change in that measure from pretest to posttest. One subject endorsed the chance subscale of the MHLC pretest such that his scores fell three standard deviations above the mean. This score could possibly have over-represented the change in the MHLC chance subscale from pretest to posttest. One subjects' pretest systolic blood pressure was (3.9) standard deviations below the mean. This systolic reading was 100 mm Hg. This reading would likely cause the change in overall systolic blood pressure from pretest to posttest to be under-represented.

Conceptually, an outlier is a value in a data set that is considered extreme and thus possibly not representative of the population being studied (Sweet & Grace-Martin, 2003). In the case of the current data set, the author posits that even though there are outlying data points in the set, these do not necessarily equate to these subjects being part of a different population. Thus, there was no reason to exclude these data points from this study. Also, these variables may not exist along a normal curve as this technique presumes. As such, the decision was made to leave the outliers in the data set.

TABLE 1A.
Descriptive information from demographic questionnaire

	No. (%)				
	N	*M*	*SD*	Min	Max
1. Age	57 (98.3)	65.8	10.77	43	86
2. Weight	58 (100)	211	49.19	130	350
3. Height (inches)	58 (100)	69.69	2.77	64	76
4. Marital	58 (100)	2.28	.74	1	6
1-Single	4 (6.9)				
2-Married	38 (65.5)				
3-Divorced	14 (24)				
4-Div/remarried	0				
5-Widowed	2 (3.4)				
6-Wid/remarried	0				
5. Race	58 (100)	3.069	1.31	1	5
1-Af. Amer./Black	15 (25.9)				
2-Asian/As. Amer.	0				
3-Latino/Hispanic	11 (19)				
4-Caucasian/White (Eur. Amer.)	30 (51.7)				
5-Other	2 (3.4)				
6. Employment	58 (100)	2.64	.744	1	4
1-Full time	11 (19)				
2-Part time	4 (6.9)				
3-Retired	38 (65.5)				
4-Not Working	5 (8.6)				
7. Income	58 (100)	3.02	1.68	1	6
1- < $15000	11 (19)				
2-$15000 - $29999	18 (31)				
3-$30000-$44999	9 (15.5)				
4-$45000-$59999	7 (12.1)				
5-$60000-$75000	5 (8.6)				
6- > $75000	8 (13.8)				

8. Education	58 (100)	2.88	1.13	1	5
1- Grade school	4 (6.9)				
2- High school	23 (39.7)				
3- Community Coll.	12 (20.7)				
4- Undergrad. Coll	14 (24.1)				
5- Graduate school	5 (8.6)				

TABLE 1B.

Descriptive information effect size for pretest and posttest variables

	N	*M*	*SD*	Min	Max	Eta^2	Overall Eta^2
1. SBPpre	58	154.93	13.99	100	195	.579	
2. SBPpost	58	134.45	17.79	98	154		
3. DBPpre	58	78.40	10.96	47	105	.469	
4. DBPpost	58	68.72	12.73	41	92		
5. HPLPIRpre	58	2.74	.559	1.78	3.89	.157	
6. HPLPIRpost	58	2.94	.486	1.67	4		
7. HPLPPApre	58	2.10	.705	1.13	3.63	.329	
8. HPLPPApost	58	2.47	.679	1.13	3.75		**.456**
9. HPLPNUpre	58	2.59	.545	1.44	4	.136	
10. HPLPNUpost	58	2.78	.516	1.89	3.89		
11. HPLPHRpre	58	2.42	.539	1.56	3.56	.410	
12. HPLPHRpost	58	2.78	.589	1.44	4		
13. MHLCchncpre	58	13.78	5.79	6	33	.075	
14. MHLCchncpost	58	15.16	6.96	6	34		
15. MHLCPowpre	58	22.55	5.69	6	36	.085	
16. MHLCPowpost	58	24.36	4.87	13	35		
17. MHLCintpre	58	25.80	7.59	6	36	.073	
18. MHLCintpost	58	27.88	5.95	11	36		
19. HypSEpre	58	44.98	9.79	26	65	.205	
20. HypSEpost	58	48.59	8.57	21	65		

Abbreviations: SBP=Systolic Blood Pressure, DBP=Diastolic Blood Pressure, HPLPIR=Health Promoting Lifestyle Profile interpersonal relations subcale, HPLPPA=Health Promoting Lifestyle Profile physical activity subscale, HPLPNU= Health Promoting Lifestyle Profile nutrition subscale, HPLPHR= Health Promoting Lifestyle Profile health responsibility subscale, MHLCchnc = Multidimensional Health Locus of Control chance subscale, MHLCPow = Multidimensional Health Locus of Control powerful others subscale, MHLCint = Multidimensional Health Locus of Control internal subscale, HypSE = Hypertension Self-Efficacy scale

EFFECT SIZE

Effect size is described as the percentage of variance in the outcome that can be attributed to the variable time (Sweet & Grace-Martin, 2003). In the table above, effect sizes were calculated for each variable subjected to T-tests as well as the HPLP-II, which was analyzed with repeated measures MANOVA. For the HPLP-II, in addition to effect sizes for each subscale, overall effect size for the measure was computed. For this study it has been determined that a small effect is represented by eta squared of 0.0 – 0.1; a medium effect is represented by eta squared of 0.13 – 0.24; and a large effect is represented by eta squared greater than 0.28 (Cohen, 1988).

BIVARIATE CORRELATIONS AMONG PSYCHOSOCIAL AND BLOOD PRESSURE MEASURES

In reviewing the pretest correlations among psychosocial measures and blood pressure it was interesting to note that hypertension self-efficacy and internal locus of control were not correlated with each other, as measured by the HypSE and MHLCint. As expected, the subscales of the HPLP-II were positively correlated with one another and the subscales of the MHLC were also positively correlated with each other. Hypertension Self-Efficacy was significantly positively correlated with all four subscales of the HPLP-II, which include Interpersonal relationships, Nutrition, Health

responsibility, and Physical activity. Powerful others locus of control, as measured by the MHLCpow subscale, was found to be positively correlated with the interpersonal relationships subscale of the HPLP-II. Systolic blood pressure was found to be negatively correlated with physical activity, as measured by the physical activity subscale of the HPLP-II. As anticipated, DBP was found to be positively correlated with SBP, indicating that when SBP increases or decreases, so does DBP and vice versa.

TABLE 2A.

Bivariate correlations for pretest variables

	1.	2.	3.	4.	5.	6.	7.	8.	9.	10.
1. HypSE	1									
2. MHLCint	.03	1								
3. MHLCchnc	-.08	.13	1							
4. MHLCpow	.03	.68**	.37**	1						
5. HPLPIR	.57**	.16	-.22	.28*	1					
6. HPLPNU	.43**	-.04	.02	-.08	.43**	1				
7. HPLPHR	.48**	-.01	-.08	.21	.56**	.52**	1			
8. HPLPPA	.45**	-.14	.11	-.01	.35**	.56**	.45**	1		
9. SBP	-.04	.12	-.17	.08	-.02	-.14	.08	-.26*	1	
10. DBP	-.09	.10	-.04	.05	-.02	-.11	.05	-.1	.44*	1

Abbreviations: HypSe=Hypertension Self-Efficacy scale, MHLCint = Multidimensional Health Locus of Control internal subscale, MHLCchnc = Multidimensional Health Locus of Control chance subscale, MHLCPow = Multidimensional Health Locus of Control powerful others subscale, HPLPIR=Health Promoting Lifestyle Profile interpersonal relations subscale, HPLPNU= Health Promoting Lifestyle Profile nutrition subscale, HPLPHR= Health Promoting Lifestyle Profile health responsibility subscale, HPLPPA=Health Promoting Lifestyle Profile physical activity subscale, SBP=Systolic Blood Pressure, DBP=Diastolic Blood Pressure, SBP=Systolic Blood Pressure, DBP=Diastolic Blood Pressure.

*p<.05, **p<.01

In reviewing posttest correlations among psychosocial measures and blood pressure an interesting change from pretest is the significant positive correlation between both internal and powerful others locus of control and hypertension self-efficacy, as measured by the MHLCint, and MHLCpow subscales and HypSE. As expected, the

subscales of both MHLC and HPLP-II remained positively correlated with one another as did systolic and diastolic blood pressure. Health responsibility was positively correlated with powerful others locus of control, as measured by the HPLPHR subscale and the MHLCpow subscale. Both systolic and diastolic blood pressures were negatively correlated with interpersonal relations, as measured by the HPLPIR subscale.

TABLE 2B.

Bivariate correlations for posttest variables

	1.	2.	3.	4.	5.	6.	7.	8.	9.	10.
1. HypSE	1									
2. MHLCint	.29*	1								
3. MHLCchnc	-.03	.04	1							
4. MHLCpow	.30*	.35**	.41**	1						
5. HPLPIR	.38**	.17	-.05	.25	1					
6. HPLPNU	.32*	.09	-.00	.21	.43**	1				
7. HPLPHR	.39**	.02	.05	.29*	.71**	.56**	1			
8. HPLPPA	.40**	.04	.04	.14	.50**	.53**	.57**	1		
9. SBP	.09	-.25	-.08	.08	-.26*	-.03	-.11	-.15	1	
10. DBP	.12	-.11	-.19	-.88	-.29*	-.09	-.21	-.18	.59**	1

Abbreviations: HypSe=Hypertension Self-Efficacy scale, MHLCint = Multidimensional Health Locus of Control internal subscale, MHLCchnc = Multidimensional Health Locus of Control chance subscale, MHLCPow = Multidimensional Health Locus of Control powerful others subscale, HPLPIR=Health Promoting Lifestyle Profile interpersonal relations subscale, HPLPNU= Health Promoting Lifestyle Profile nutrition subscale, HPLPHR= Health Promoting Lifestyle Profile health responsibility subscale, HPLPPA=Health Promoting Lifestyle Profile physical activity subscale, SBP=Systolic Blood Pressure, DBP=Diastolic Blood Pressure, SBP=Systolic Blood Pressure, DBP=Diastolic Blood Pressure.
*p<.05, **p<.01

RESEARCH QUESTION 1

This question addressed change in blood pressure from pretest to posttest. It was hypothesized that participation in the DIGMA would contribute to a reduction in blood pressure over time.

To test this hypothesis, paired T-tests were performed to analyze change in systolic and diastolic blood pressure from pretest to posttest. A significant reduction in both systolic and diastolic blood pressure from pretest to posttest was detected. Systolic blood pressure (pretest M = 154.93 mm Hg) was reduced an average of 20.5 mm Hg (posttest M = 134.45). T (57) = 8.851, $p < .05$. Diastolic blood pressure (pretest M = 78.40) was reduced an average of 9.7 mm Hg (posttest M = 68.72). T (57) = 7.091, $p <$ .05. Effect sizes for both systolic and diastolic were high with respective 58% and 47% of the variance in scores attributable to the variable time. It is interesting to note that while mean systolic blood pressure at pretest was in a clinical range, mean diastolic blood pressure at pretest was at a non-clinical level. Additionally, both systolic and diastolic were reduced from pretest to posttest to non-clinical levels.

RESEARCH QUESTION 2

This question addressed change in self-efficacy specific to hypertension from pretest to posttest. It was hypothesized that participation in the DIGMA would contribute to increased self-efficacy specific to hypertension over time.

To test this hypothesis, a paired T-test was performed to analyze change in self-efficacy specific to hypertension from pretest to posttest. A significant increase in hypertension self-efficacy was detected, T (57) = -3.838, $p < .05$. Pretest (M = 44.98) and

posttest (*M = 48.59).* Effect size for the HypSE was found to be medium with 20% of the variance attributable to time.

RESEARCH QUESTION 3

This question addressed whether significant changes in health promoting behavior from pretest to posttest could be detected. It was hypothesized that participation in the DIGMA program would contribute to greater adoption of health promoting behavior.

Pretest and posttest scores from four subscales of the HPLP-II were entered as dependent variables into two repeated measures MANOVA's to analyze change from pretest to posttest (questions 5 and 6) and, if any were detected, whether or not these changes were predicted by pretest scores on both the HypSE and MHLCint, the independent variables. Significant changes between pretest and posttest were detected in all four of the HPLP-II subscales, which include interpersonal relations (HPLPIR); nutrition (HPLPNU); health responsibility (HPLPHR); and physical activity (HPLPPA). The MANOVA for question 5 yielded a multivariate analysis of the main effect for time showing a significant change from pretest to posttest for all four of the HPLP-II subscales: F (4, 53) = 11.105, $p < .05$, indicating that scores on all HPLP-II subscales were significantly greater at posttest than they were at pretest. Similarly, the MANOVA for question 6 yielded a multivariate analysis of the main effect for time showing a significant change from pretest to posttest for all four of the HPLP-II subscales: F (4, 53) = 11.188, $p < .05$, additional evidence that scores on all HPLP-II subscales were greater at posttest than they had been at pretest.

Univariate analyses of the effect of time yielded the following significant results: HPLPIR: F (1, 56) = 11.43, $p < .05$; for HPLPNU F (1, 56) = 8.81, $p < .05$; for HPLPHR: F (1, 56) = 39.61, $p < .05$; and for HPLPPA: F (1, 56) = 27.61, $p < .05$.
(See Table 1b for means).

Overall, the effect size across the four subscales was large, with 46% of the variance in scores attributable to time. Individually, change in the IR scale saw a medium effect, with 16% of variance attributable to time; change in the PA scale saw a large effect, with 33% of the variance attributable to time; change in the NU scale saw a medium effect with 14% of the variance attributable to time; and change in the HR scale saw a large effect, with 41% of the variance attributable to time.

RESEARCH QUESTION 4

This question addressed whether significant changes in health-related locus of control from pretest to posttest could be detected. It was hypothesized that participation in the DIGMA would be associated with an increase in internal locus of control over time and a decrease in chance and powerful other locus of control over time.

To test these hypotheses, three paired T-tests were performed to analyze change in each of the three subscales of the MHLC from pretest to posttest. A Bonferroni correction was employed to account for the potential inflation of alpha. With the Bonferroni correction changes between pretest and posttest were not significant in any of the three MHLC subscales, which include internal locus of control (MHLCint) T (57) = -2.112, $p = .039$; powerful other locus of control (MHLCpow) T (57) = -2.31, $p = .025$; and chance locus of control (MHLCchnc) T (57) = -2.154, $p = .025$. The Bonferroni

correction is a conservative method of looking at these data to ensure that marginally significant results are not being overestimated due to the repetition of statistical procedures on the same data. However, without the Bonferroni correction, these findings would be significant at the ($p < .05$) level. While interpreting these results with caution is warranted, the potentially significant findings on this measure are intriguing.

Non-significant changes in internal locus of control occurred in the expected direction, that is, subjects endorsed greater internal locus of control at posttest (M = 27.88) than they had at pretest (M = 25.80). Non-significant change in chance locus of control occurred in an unexpected direction. Subjects endorsed greater chance locus of control at posttest (M = 15.16) than they had at pretest (M = 13.78). Similarly, powerful other locus of control changed in an unexpected direction. Subjects endorsed greater powerful other locus of control at posttest (M = 24.36) than they had at pretest (M = 22.55).

Each of the three subscales of the MHLC saw a small effect size, with between 7% and 8.5% of variance attributable to time.

RESEARCH QUESTION 5

This question addressed the relationship between baseline levels of hypertension self-efficacy and changes in health behavior. Based on the literature connecting self-efficacy with the process of change (DiClemente et al., 1991; Levesque et al., 1999) it was hypothesized that pretest levels of hypertension self-efficacy would predict degree of change in health behavior such that those endorsing low hypertension self efficacy at

pretest would adopt health promoting behaviors at a lower rate than those endorsing high hypertension self-efficacy at pretest.

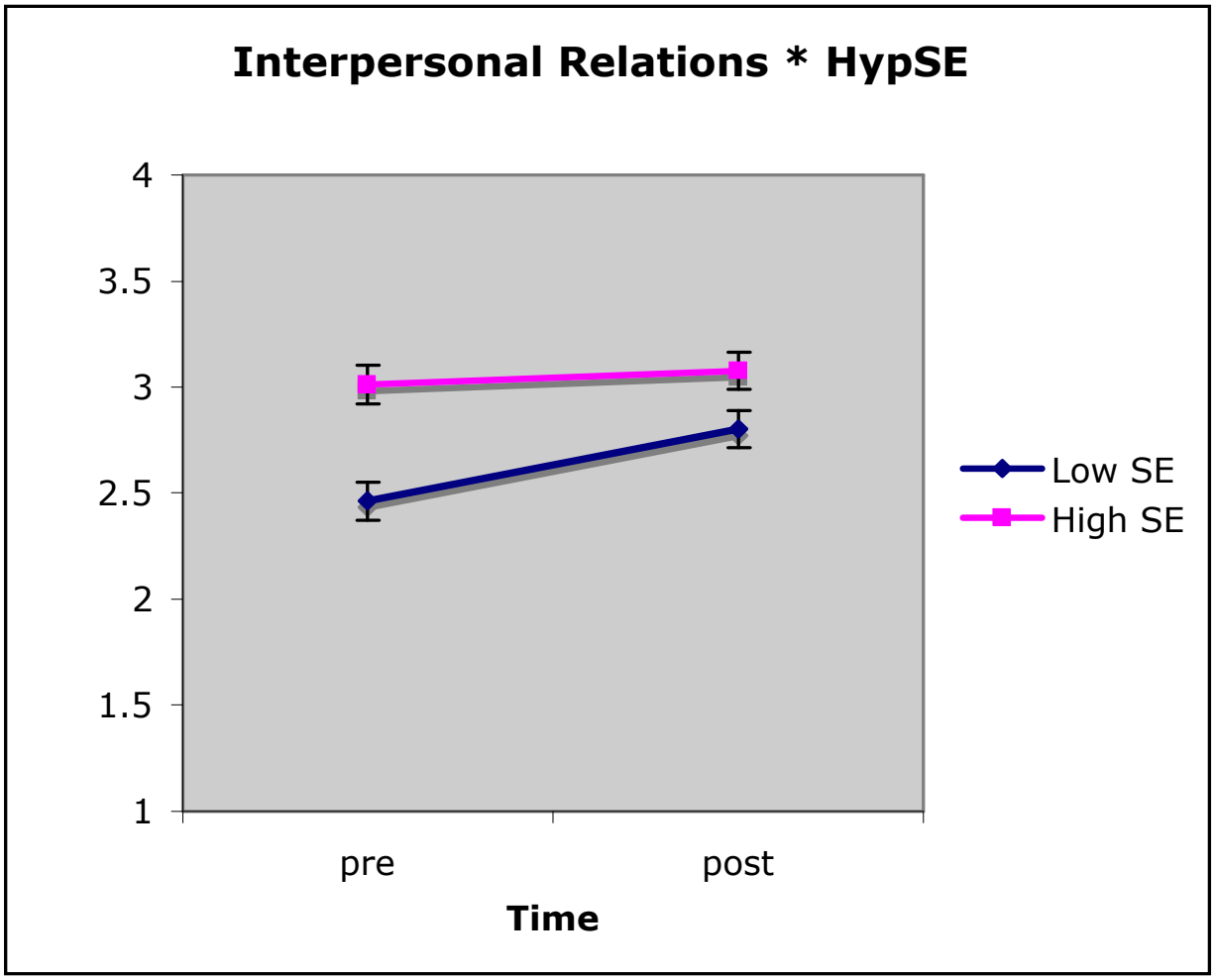
To test this hypothesis, a repeated measures multivariate analysis of variance procedure (MANOVA) was utilized to determine whether pretest levels of hypertension self-efficacy predicted changes between pretest and posttest levels of health promoting behavior (as measured by four subscales of the HPLP-II). Pretest hypertension self-efficacy was dichotomized into low self-efficacy (< 45.5) and high self-efficacy (> = 45.5). This cut score was reached by calculating a median split based on the range of responses. The decision to establish the categories of low and high hypertension self-efficacy influenced the selection of statistical procedures. After consulting with the principal faculty advisor to this study, repeated measures MANOVA was chosen for this analysis. MANOVA tends to be a more conservative method than regression in that it is unlikely to overestimate significant findings, while also being robust. Gordon (1968) mentions that one of the dangers of multiple regression occurs when independent variables are correlated, causing small sampling or measurement errors to be magnified. Additionally, MANOVA tends to be easier to compute. Also, MANOVA works best when an independent variable is categorical, as opposed to multiple regression, which would have dictated that HypSE should remain continuous.

Results of this procedure indicated that low and high self-efficacy groups did in fact represent two distinct groups as they were significantly different from one another F $(4, 53) = 6.407$, $p < .05$ as measured by the HypSE. Also, for both the low and high self-efficacy groups, significant increases in health promoting behavior from pretest to posttest were detected F $(4, 53) = 11.105$, $p < .05$. The multivariate interaction between

time and group membership was not significant F (4, 53) = 2.217, p = .080, indicating that membership in either the low or high self-efficacy group was not associated with the amount of change in health promoting behavior. Restated, while both low and high pretest hypertension self-efficacy groups measured significant change in HPLP-II subscale scores from pretest to posttest, the changes were not significantly different from one another.

As an exploratory step, univariate tests of the interaction between group membership and time were examined. Results of these tests indicated a significant effect for the HPLPIR subscale only F (1, 56) = 5.275, $p < .05$ (see Graph 1). The remaining three subscales did not yield significant effects, possibly explaining the lack of a multivariate effect.

GRAPH 1 – Univariate Interaction between pretest HypSE and change in HPLPIR over



time

It is interesting to note that the relationship between pretest self-efficacy and change in interpersonal relations (HPLPIR) over time did not occur as predicted. It was predicted that individuals with high self-efficacy at pretest would change at a higher rate than those with low self-efficacy at pretest. As Graph 1 depicts, the opposite appears to have been the result.

RESEARCH QUESTION 6

This question addressed whether pretest levels of internal health-related locus of control would predict the degree of change in health behavior from pretest to posttest. It was hypothesized that over time, those endorsing higher levels of internal health-related locus of control at pretest would adopt health-promoting behaviors at a higher rate than those endorsing lower levels of internal health-related locus of control.

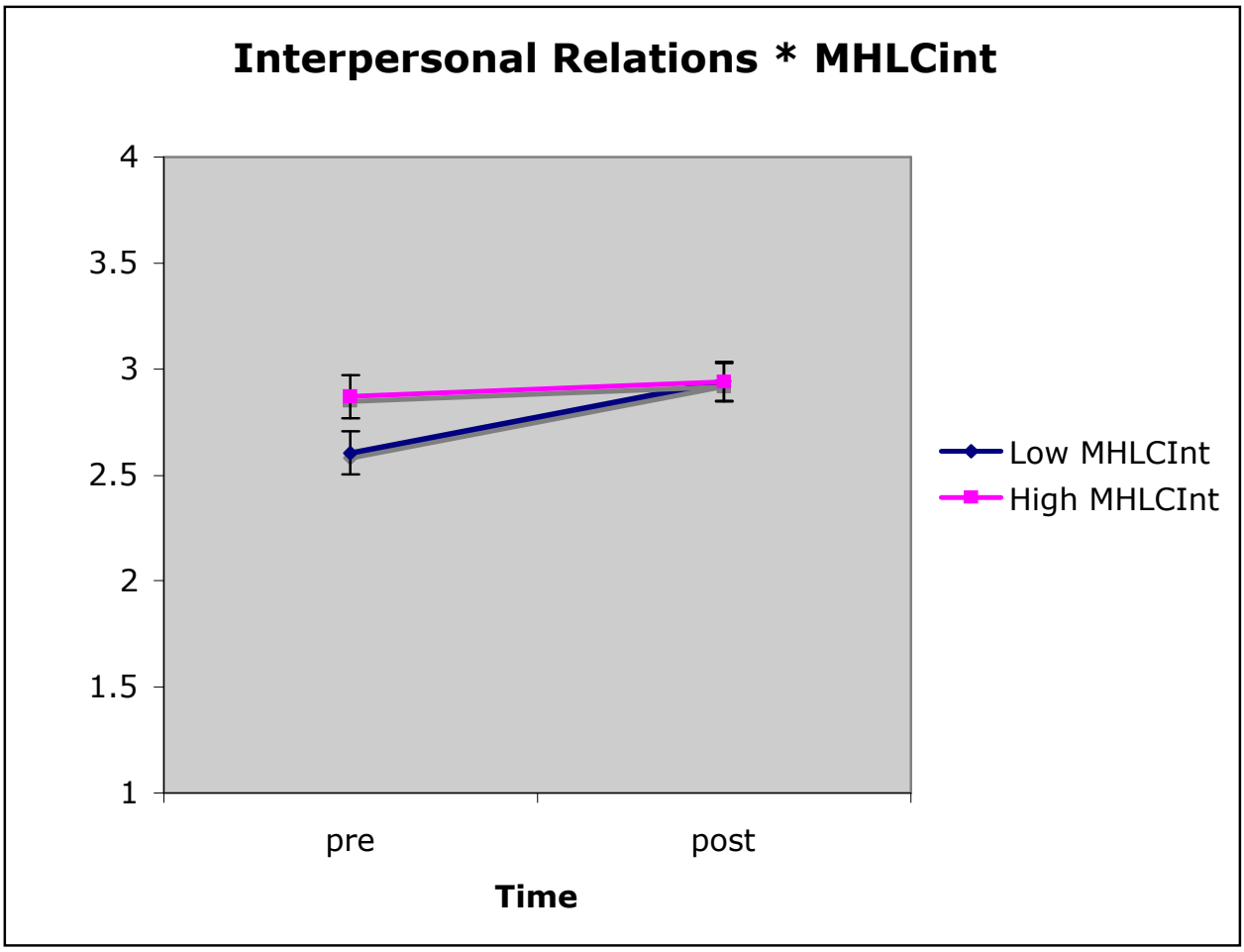
To test this hypothesis, a repeated measures multivariate analysis of variance procedure (MANOVA) was utilized to determine whether pretest levels of internal locus of control (MHLCint) would predict degree of change in health promoting behavior from pretest to posttest (as measured by four subscales of the HPLP-II). As above, it was determined that looking at MHLCint as a potential predictor of change in HPLP scores necessitated the establishment of categories of low and high internal locus of control. Therefore, it was necessary to employ repeated measures MANOVA so that the categorical independent variable could be accounted for properly. Pretest internal health locus of control was dichotomized into low internal locus of control (< 27.5) and high internal locus of control (> = 27.5). This cut score was reached by calculating a median split based on the range of responses.

Results of this procedure indicated that as above, for both the low and high internal locus of control groups, significant increases in health promoting behavior from pretest to posttest were detected F (4, 53) = 11.188, $p < .05$. However, no between subjects effects were detected for low or high MHLCint, thus the groups were not significantly different from one another F (4, 53) = .996, $p = .418$. The test of the

interaction between time and group membership was also not significant F (4, 53) = 2.080, p = .096.

As an exploratory step, an examination of univariate tests yielded a significant interaction between group membership and time for the HPLPIR subscale only F (1, 56) = 4.96, $p < .05$. The remaining three subscales did not yield significant effects, possibly explaining the lack of a multivariate effect. The significant univariate interaction is depicted in graph 2 below.

GRAPH 2 – Univariate Interaction between pretest MHLCint and change in HPLPIR over time



Also notable for the above interaction is that, like in question 5, results did not occur as predicted. Rather, the opposite is depicted by the graph. Those entering the study with higher levels of internal locus of control were hypothesized to change at a higher rate than those entering the study with lower internal locus of control. This hypothesis is not reflected in these results. At posttest, it is apparent that differences between low and high MHLCint groups drops down to a non-significant level.

Table 3

T-tests for differences between pretest and posttest measures

Variable	*t*	df	*p*
1. SBP	8.851	57	< .001*
2. DBP	7.091	57	< .001*
3. HypSE	-3.838	57	< .001*
4. MHLCint	-2.112	57	.039
5. MHLCchnc	-2.154	57	.036
6. MHLCPow	-.2305	57	.025

Abbreviations: SBP=Systolic Blood Pressure, DBP=Diastolic Blood Pressure, HypSE = Hypertension Self-Efficacy scale, MHLCint = Multidimensional Health Locus of Control internal subscale, MHLCchnc = Multidimensional Health Locus of Control chance subscale, MHLCPow = Multidimensional Health Locus of Control powerful others subscale
* significant at the Bonferroni adjusted p < .0083

Qualitative Data

Semi-structured telephone interviews were conducted to collect qualitative data, illuminating patients' experiences of the DIGMA as well as their ideas about specific components of the DIGMA that contributed to any change in behavior. Questions were designed as an informal assessment of where subjects' fell on the stages of change continuum (Prochaska & Norcross, 2001) as well as their stated beliefs relating to locus of control and self-efficacy. The purpose of the qualitative component of this study is to ascertain the participants' experiences with the program in their own words. Respondents to the qualitative interviews were comprised of individuals who completed all aspects of

the DIGMA program as well as those who dropped out at any point. Of the 75 individuals who began the study (including graduates and dropouts), qualitative data were collected for 60 of them. 30 of these answered questions relating to stages of change, DIGMA pros and cons, self-efficacy, health behavior, and locus of control. The remaining 30 answered different questions designed by another researcher looking at distinct but related constructs. Thus, qualitative data for this study is based upon 30 participants' responses. 22 of these graduated from the program and 8 had dropped out prior to posttest. They were contacted approximately two weeks after the termination of their DIGMA group and the interviews were conducted in an informal manner, utilizing conversational language that was comfortable to the participants. Often, just introducing myself as the DIGMA facilitator was enough to prompt the participant to begin talking about his experience. The interview was designed with a primary question followed by 'probe' questions to give the respondent a prompt about the topic of discussion. Questions and their corresponding probes are detailed below. Responses to each question have been examined by the researcher. Themes were recorded and frequent responses are noted below.

QUALITATIVE RESULTS - GRADUATES

Question 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, or dealing with stress.

This question elicited general changes made over the period of time that the participant was involved in the DIGMA. The themes that came from this question were: reduce stress; improve diet, reduce salt and fat intake; lose weight; exercise more; increased reliance on family for support; keeping tabs on feelings of anger

The most frequent responses dealt with diet, including salt intake and generally healthy eating habits. The second most frequent responses concerned increasing exercise. The third most frequent response related to the reduction of stress.

It was clear that most participants took away dietary and exercise ideas from this program. Many of the participants indicated that they had been aware of some of the recommended guidelines but appreciated having the chance to practice them and put them into action. For example: "I'm watching my carbohydrates, got my diabetes down…I'm trying to be more active and get around more during the day…I got a lot of good hints on diet." Others responded to the stress-management component of the program: "I'm trying not to let things bother me…I'm staying at peace."

Probe B: To what or whom do you attribute these changes?

This question elicited locus of control and self-efficacy beliefs. Themes from responses to this probe were: the DIGMA; desire to change; awareness; shared experience; desire for prolonged future; religion; motivated by the group.

The most frequent responses to this question related to participation in the group.

The vast majority of respondents indicated that the DIGMA had an effect upon them. They added that they had been aware of many of the suggested changes but

needed the structure of the group in order to take some action to make the changes: "I remember that this stuff I learned in the group was stuff I already knew, I just needed a push." Another participant responded: "I think that I understood things better when they explained things in the group. It made me listen and remember important things." Participants expressed an understanding that their habits were not producing ideal results and many expressed a 'desire to change' so that they could have the opportunity to continue to see their grandchildren grow up.

Question 2:
How have your views of personal control over health issues changed, if at all?

This question also elicited responses related to locus of control. Themes from responses to this question were: No changes; increased control over health; increased control over diet; and increased awareness.

The most frequent responses to this question related to feeling a sense of control over their health. The second most frequent response, with about one third responding this way, was that no changes have occurred.

Many participants indicated that they felt a greater sense of control over their health as they had been participating and seeing the short-term results in their own lives: "Yes! I'm more determined to be in charge of my health." Another participant responded in reference to our suggestion to create a collaborative relationship with health providers: "They have changed! I don't mind going to the doctor anymore…I'm not afraid…I feel like I can talk with them."

Those participants who responded to this question that they had not experienced changes in their views of control over health issues tended to indicate that they had already felt like they were in control of their health. Though impossible to prove statistically, these may have been individuals who were higher on internal locus of control at the beginning of the study.

Probe A: Talk about any changes in the way you think about your primary care provider.

This probe elicited information regarding locus of control and self-efficacy. Themes from responses to this probe were: no changes; increased self-reliance; decreased reliance upon medical staff; increased collaboration with medical staff; increased comfort with medical staff.

The most frequent them from this question indicated that no changes had occurred.

The participants had some difficulty with this question as it presumed an understanding of the changes desired by the researchers for an increase in collaboration. However, some did seem to indicate a positive change in this area: "I was depending upon my doctor before...now I regulate my own BP."

Question 3:
How capable are you of handling your own health problems?

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

This question elicited information about self-efficacy beliefs as well as knowledge about healthy behavior. Themes from responses to this question ranged from moderately capable to extremely capable.

The most frequent response to this question related to being capable of handling health problems with the vast majority of respondents answering this way.

The participants indicated a sense of efficacy that appeared to be a shift from beliefs at the outset of the groups. Many of them entered the program expecting to be lectured to and given handouts to take home with them. Instead, they were asked to participate and include examples from their own experiences. One respondent said: "Getting better. I was concerned before but now I'm taking an active part".

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

The majority of respondents indicated that changes had occurred over the past month. Others answered that this is not a change for them or that they still had not made changes.

Participants seemed to indicate that while most of them had noticed these changes over the past month, it had more to do with creating motivation to do what they knew they needed to do: "You've given us tools to better provide for our healthcare…but I was never negligent…good healthcare begins with oneself…it has been enhanced." Others mentioned that some aspects of the group were more useful to them than others: "Yes, more info after the past month. I took it very seriously…I picked pieces that fit best."

Those who did not feel they had changed over the past month may, like qualitative question 2, have been confident in their handling of health issues prior to

entering the DIGMA program. An alternative explanation is that some participants did not get as much from the program as others. For example, there were participants who agreed that changes should be made to their behaviors but were clear that they had no intention of making changes.

Question 4:
What was your experience of the DIGMA program like?

This question was intended to aid in the evaluation of the DIGMA program. Themes from responses to this question were: Very good; I enjoyed the information from the pharmacist; I enjoyed checking blood pressure regularly; I enjoyed listening to others; I would like a similar program dedicated to diabetes; I really enjoyed the handouts; and one participant noted that "some people talk to much."

Most frequent responses were related to having had a positive experience. Respondents spoke at length about the experience of being in the group. They expressed gratitude to the other members for sharing their stories and were also appreciative of the facilitators for maintaining the integrity of the group process, which, they recognized, occasionally presented a challenge.

Many of the participants are of retirement age and thus are less engaged with people outside of their home than they had been in previous years. Many expressed that they really got a lot out of meeting and sharing with the other participants. Others referred to the different dynamic in the group setting than they were accustomed to in typical medical treatment settings. A recognition of being part of a community was elaborated upon, whereas typically the focus is on the individual.

Participants openly expressed gratitude to the facilitators for providing this program. They shared some degree of surprise that veterans were being offered this opportunity and had no difficulty coming up with nice things to say about the program itself and about the facilitators. One participant commented: "It was great, in particular talking about how medication acted and how to make sure your blood pressure stays intact." Other participants remarked about the group dynamics and the role that played in their experiences: "I liked the camaraderie, having things in common with others. I really enjoyed it a lot."

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

Themes from responses to this probe were: the 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; receiving information about various medications; meeting new people.

The most frequent response to this question related to the sharing of experiences with others and knowing there were others going through it. Another frequent response related to getting detailed input from professionals.

Virtually every aspect of the DIGMA got a good response. While each member of our sample had unique circumstances, everyone seemed to be able to find something that fit for them: "Being single…I have to be intentional about what I eat…stay away from grapefruit…lose weight." They also seemed very appreciative of the access to

resources the DIGMA provided: "Free flow of information…ability to have the physicians helping out. Sharing experiences and seeing how others manage."
Probe B: What were some of its shortcomings? Or what could be added to improve the program?

Themes from responses to this probe were: I would have liked more information on exercise; I wanted more dialog with physicians; There was some initial confusion regarding purpose of the meetings; I would like more handouts; and I would like there to have been more interaction between members.

While this question yielded some useful information for program development, it was a challenge to get the participants to say negative things about the program. Perhaps, had the telephone interviews been conducted by someone not affiliated with the study, we could have gotten different data. The most frequent responses to this question were that nothing should be changed. But those who were bold enough to offer constructive feedback made suggestions such as: "Getting people to talk more because it helps a lot…it helps to better understand high blood pressure."

Question 5:
What was your initial reaction when you first learned about this health program?

This question was intended to elicit initial beliefs regarding the change process. Themes from responses to this question were: I didn't want to come; I needed it; I was unsure about what it would be like; excited; I worried it would be a waste of time; and I was interested/curious.

The most frequent responses were positive, suggesting an interest in the program though several participants admitted that they were initially hesitant and had low expectations. Still others remarked that they were unclear about what they had signed up for.

Generally, it appeared that many of these men were accustomed to being contacted by the VA to participate in some sort of health program. Many of them are retired and so the chance to get out of the house and possibly learn something is intriguing. Unfortunately, many of these same men also appear to have fairly low expectations of the VA. So when asked to look back at how they reacted when offered this program, they seem to recall a sense of caution. For example: "I thought this would be just another waste of time…but this was more patient oriented." Others expressed some surprise at the power of the group interaction: "I thought that it would be about me but it was about us."

Question 6:
Thinking back over the past month, how ready were you to make changes to your health status?

This question also was intended to begin a conversation about readiness to change behavior. Themes from responses to this question were: ready; not very ready; changes aren't necessary for me; and age stated as a factor in willingness to change.

The most frequent response type was that of a sense of readiness to change behavior. Due to the informal nature of this inquiry it was not possible to assess each individual via the Prochaska & Norcross (2001) stages of change continuum. However,

many of the participants of this study had been struggling to manage their blood pressure for many years. They may have recognized that the purely medical model is producing less than stellar results in their cases. So, by responding affirmatively to participate in the program, they are endorsing a sense of readiness or at the very least, curiosity about what others were doing. One participant commented: "Quite ready. I am willing to do anything that can help. That is one reason I went to the program and it was great to hear how other people are handling things. I came out feeling that regular exercise was going to be important."

QUALITATIVE RESULTS – DROPOUTS

Program dropouts comprised any participant who was not able to complete the study by attending all 4 meetings and completing both pretest and posttest. Some dropouts left the program after the first week while others only missed the final session. 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 ascertain whether the program or personal reasons influenced the individual to drop out. Themes from this question comprised: confusion about the amount of time required; personal problems; family emergency; I was ill; conflicted with work schedule; transportation problems

Due to the relative size of this sub-sample, there was no specific trend in responses to this question. Generally, however, reasons for non-completion of the study had to do with personal circumstances rather than programmatic limitations. For example, one person stated: "I had to miss the appointments due to a family emergency."

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

The small sub-sample responding to this inquiry tended to answer that the DIGMA had met their needs and that, as above, their non-attendance was mostly related to an outside circumstance. One participant responded: "Yes, very helpful. I liked everybody. My wife liked it, too." Another commented that he enjoyed the "eastern philosophy" which may have referred to discussions about yoga and meditation. One participant complained that he felt the "material was redundant." For the most part, this small group responded positively and did not have complaints to voice in response to this question.

Additional Question 4:
Would you be willing to reenroll?

This question was intended to address the non-completing participants dedication to the type of interface the DIGMA provides. These individuals may have been less certain about the program than their 'completing' peers. The general sense was that something would have to be different about the program for them to reenroll, whether that referred to the time the program is offered or the content available. Many of these non-completers had taken part in a few of the sessions and thus, may have felt that they

would be wasting their time to join again. For example, one person responded: “I have already heard what you have to tell me.”

CHAPTER 5: DISCUSSION

This chapter will address the findings from this study. Initially the results of the study will be addressed. Then, the implications of these findings upon the DIGMA program will be discussed. Next, the broader implications of integrating health services in this way will be addressed. Following this, an in-depth look at the limitations of this study will be looked at. And finally, ideas for future research in this area will be introduced.

However, first, it is important to acknowledge some major limitations of this research. This study was intended to be exploratory. Without funding or system-wide support of our efforts, it was the goal of the researchers to 'test the waters' in this area to determine whether programs of this kind could be efficacious in the treatment of chronic ailments. We also wanted to know whether this would be pleasing to patients and providers alike. The results of this exploratory study will hopefully yield increased interest in this type of program so that funding could be provided and resources dedicated specifically to its maintenance.

With such limited resources, it was impossible to gather data from enough people in order to have a control group to compare our results with. Also, methodologically, it was impossible to randomly assign participants to our program. We had lists of people to recruit and while we selected some of them to receive our telephone calls, it was the participants themselves who decided whether or not taking part in the DIGMA would be agreeable to them.

FINDINGS

Significant findings between pretest and posttest measures of systolic and diastolic blood pressure may have implications for the efficacy of the DIGMA program as a means to create change for HTN patients. As referenced earlier, an extensive study of HTN patients undergoing pharmacological treatment to reduce HTN symptoms yielded an average reduction in systolic and diastolic blood pressure of 23 and 7 mm Hg respectively (Staessen et al., 1997) which compare to results of the current study with average reductions of 20 mm Hg systolic and 10 mm Hg diastolic. The individuals in the DIGMA study were also undergoing pharmacological treatment for HTN. Many of these participants have been undergoing HTN treatment for decades. Although medication was not controlled for in the current study, the findings of this study may suggest that participation in the DIGMA may be associated with a further reduction in systolic and diastolic blood pressure above and beyond that achieved by pharmacological means. In addition, it is possible that the cognitive-behavioral aspects of the DIGMA program are the missing links for participants who have been struggling to manage their HTN symptoms for many years. The biomedical model alone may not be adequate for these individuals and therefore, the addition of a psychosocial intervention appears to have added to the effectiveness of their attempts to manage symptoms (Engel, 1977). In reference to McAlister et al., (2005), we may be treating the 23% of HTN patients who are uncontrolled despite pharmacological treatment.

This study is predicated on the assumption that health is a multi-faceted concept which requires a multi-faceted approach in order to maintain. Merely treating the physical body as a machine, whose parts and functioning can either be altered by

mechanical means or through the introduction of chemicals, is an incomplete solution that is destined to fail. In contrast, comprehensive treatment would address aspects of the mind and body, giving each equivalent weight (Engel, 1977). The DIGMA program being addressed in this study appears to be promising evidence of the latter.

Uncontrolled HTN tended to be influential in the referral/recruitment process. The recruitment process for the DIGMA program allows individuals to self-select for participation such that when they first heard about the program they could decide whether or not they needed additional assistance with HTN management. In fact, based on anecdotal data from the recruitment process, when potential recruits declined to participate in the DIGMA one of the most frequent reasons is that their HTN '…has been under control.'

Pretest diastolic blood pressure was not in the clinical range. Given that the mean age of this sample was approximately 65 years, this diastolic data is consistent with research indicating that diastolic blood pressure reduces with age (JNC, 2003). In fact, we found that diastolic blood pressure was strongly negatively correlated with age among our sample; (-0.460) for pretest diastolic blood pressure and (-0.410) for posttest diastolic blood pressure.

Significant changes in measures of self-efficacy specific to HTN, as measured by the HypSE, have interesting implications for this population. Since, outside of pharmacological treatments, many of the techniques for the management of this chronic ailment are behavioral, any intervention that has the effect of improving patients' sense that they can actually have an efficacious impact upon their problem would be welcome. These findings are supported by the research of Sacco et al. (2005) who found positive

associations between higher self-efficacy and subsequent adoption of health promoting behaviors. Also, Hoelscher, Lichstein, & Rosenthal's (1986) findings that correlated self-efficacy with outcomes of HTN treatment are supported as well. Clearly, improved self-efficacy to manage HTN appears to have a precedent of positive outcomes for the patients themselves.

Examination of the change scores on all subscales of the HPLP-II from pretest to posttest yielded encouraging findings. Significant increases in health promoting behavior were found in the domains of interpersonal relations, nutrition, health responsibility, and physical activity. This may suggest that participation in the DIGMA could be a link between information and action as most of the participants were already familiar with the suggested lifestyle modifications brought about in the DIGMA. In particular, significant change in the interpersonal relations subscale of the HPLP-II may speak to the importance of the group modality as participants grew to feel comfortable and accepted by their peers (Yalom & Leszcz, 2005).

Non-significant multivariate findings from the comparison of HPLP-II change scores with pretest levels of self-efficacy seems to indicate that level of self-efficacy may not predict treatment outcomes. Instead, the DIGMA program may have a positive effect behaviorally upon individuals regardless of their sense of self-efficacy prior to the program. While the original hypothesis was not supported, this is good news for patients in that attitudes about the ability to manage hypertension appear to have little bearing upon the results of participation in the DIGMA program upon blood pressure.

Univariate findings linking significant increases in the interpersonal relations subscale of the HPLP-II with membership in either the low or high hypertension self-

efficacy group are intriguing. These findings suggests that levels of pretest self-efficacy predicted degree of change in interpersonal relations, with those in the low self-efficacy group experiencing greater increase in interpersonal relations over time. This may indicate that, more so than other aspects of health behavior, change in interpersonal relations are associated with self-efficacy. Findings from Major et al., (1990) which indicated a relationship between self-efficacy and social support, may shed light upon this association. But, conversely, there may also be some association between a lack of self-efficacy and the reliance upon and maintenance of social relationships. This difference may be explained by the buffering versus direct effect hypotheses (as cited in Penninx et al., 1998).

At first glance, internal locus of control, as measured by the internal subscale of the MHLC, increased significantly. However, with the Bonferroni correction, this was no longer true. Thus results should be interpreted with caution. Without accounting for the Bonferroni, significant findings in this area may have been interpreted as meaning that the DIGMA imparted a sense in its participants that they have more control than they had originally thought over their health. Similar to findings with hypertension self-efficacy, higher internal locus of control suggests that subjects feel that they can handle their HTN by adjusting behavior and implementing stress reduction techniques.

Unexpected increases from pretest to posttest in both the chance and powerful others subscales of the MHLC are difficult to explain. It was anticipated that as internal locus of control increased, chance and powerful others locus of control would decrease or at least they would not change. This was not substantiated by our findings. As the Bonferroni correction was later taken into account, the changes from pretest to posttest on

both of these subscales were no longer significant. These expectations were based upon the psychometric studies conducted by the author of the measure (Wallston, 2005).

Also unexpectedly, level of internal locus of control at pretest was not associated with degree of change in health behavior. In fact, we were not able to detect a significant difference between individuals who were placed in the low and high internal locus of control groups. The developers of the scale did not dichotomize the internal subscale of the health locus of control measure into low and high as has been done here (Wallston, 2005), so it is difficult to compare results attained in the current study with those of the test developer. But, again, since we did see overall significant change in health behavior, perhaps locus of control at pretest has little to do with this and the DIGMA can have positive impact upon participants regardless of their locus of control.

Originally, the MHLC was conceptualized with internal locus of control as a positive attribute and chance and powerful others locus of control as negative attributes. Thus, the goal was to increase internal locus of control and decrease chance and powerful others locus of control. It was later pointed out that this conceptualization did not take into account cultural differences. Particularly, differing cultural beliefs about independence versus interdependence come to play here (Casas & Pytluk, 1995; Sue, 2001; Sue & Sue, 2003). Whereas the dominant Western culture may hold that self-reliance and independence are adaptive, Hispanic and/or African American culture may suggest that relying on your extended family and community is adaptive (Casas & Pytluk, 1995; Sue, 2001). Thus, the concept of internal locus of control is adaptive for one group and less so for another. Similarly, chance and powerful others locus of control may

suggest a belief in a higher power. While the scientific community may shun reliance on religion and spirituality, these may, in fact, be adaptive for many people.

So, it is important to revise the stance taken on the locus of control measure. All three subscales of the MHLC increased over the period of the DIGMA (without the Bonferroni correction). Rather than interpreting these results as anomalous or unexpected, given the ethnic and cultural makeup of the sample, increases in MHLC subscales can be interpreted as positive for the various cultural groups represented.

Qualitative Findings

Results from the qualitative data added richness to the quantitative results. Hearing the participants talk about their experience with the DIGMA was validating. Instead of being somewhat guarded on the telephone, as they had been at the recruitment phase, they were warm and open to share with us. This seemed to indicate that we had some positive effect upon them. They expressed gratitude for the opportunity to participate, even though they readily admitted some hesitance at the beginning. They expressed pleasure at the chance to share their experiences with others and spoke of learning a great deal about their condition by listening to the providers and other participants as well.

Many of them had not considered the impact their stress had upon their blood pressure and with the everyday example of traffic, were able to monitor themselves and report back to the group. Others had become accustomed to overeating and were able to share their experiences with attempting new methods to reduce salt and portion size.

They reflected upon their attitudes about their current situation, whether they would like to be making changes or just listening to learn about their condition. By far, the most commented upon aspect of the program was the experience of being in a group

and sharing experiences with others. Many expressed relief to learn that they were not alone with the problems they struggle with. Others spoke of 'camaraderie' and how refreshing it had been to connect with their peers.

These findings seem to connect with the quantitative findings in that hearing others tell their stories and offer tips; they were able to increase their own sense of self-efficacy to do the same. Learning about the health promoting behaviors that were within their reach and would not be too unpleasant to undertake seemed to occur as they interacted with one another. Perhaps sitting in this group setting was, in itself, a factor in the reduction of blood pressure.

Implications for Counseling Psychology

Findings regarding the utility of the DIGMA program are promising. The overarching message seems to be that integrating mental health services and techniques with the biomedical standard of care could lead to positive outcomes for HTN patients.

In busy healthcare settings such as the VA, it is common for patients to have truncated contact with their healthcare providers (Yu et al., 2003; Westheimer et al., in press). With limited access to health professionals, exposure to health knowledge is also limited (Blumenthal et al., 2002). The argument could be made that if patients were to simply follow doctors' orders, positive results would be achieved. But, in part from the results of this study, it is clear that simply being given a mandate is not enough to generate behavior change. Such change also appears to require an alteration in thinking about the problem as well as potential solutions. Another result of the limited contact between health provider and patient is that the provider is less aware of the unique cases

of each patient. This limits their effectiveness, requiring a trial and error process that, due to the enormous caseloads faced by VA health providers, can often span many months and even years before an adequate medical solution can be found.

An intervention, such as the DIGMA, which honors the patients' individual experience and encourages exploration into the process of creating change appears to achieve desired results in a more efficient manner than the purely biomedical standard of care. Also, creating a climate within healthcare where the patient is somewhat of an expert on their unique health situation may lead to a more collaborative interaction between patient and provider, thus streamlining the process of health service delivery (Noffsinger, 1999; Blount, 2003; Cummings, 2003).

Not surprisingly, the group modality was one of the biggest successes of this study. Looking at the results of the qualitative data, participants were particularly animated when discussing their experiences with the DIGMA, sharing with others, listening to others and experiencing a sense of "camaraderie." Yalom and Leszcz' (2005) discuss universality as the experience in a group setting when one realizes that they are not alone in their struggles; that others are experiencing surprisingly similar circumstances. Universality may be the most important aspect of the group experience for DIGMA participants. At their age and stage in life, to be reminded that they are not alone seems to have been a powerful experience. But the concepts of modeling and a sense of belonging (Yalom & Leszcz, 2005) also appeared to be present in the experiences of DIGMA participants.

Bandura (1977) spoke of social learning and its frequent occurrence as a result of the observation and imitation of the behavior of others. If providing usual and customary

medical care in a group setting can have a beneficial effect upon HTN patients, then it would be possible to alter the overall patient experience to become one that embraces more of a community experience, rather than a solitary one. This may serve to allow the patient community to model healthy behavior, which could then be imitated by others.

However, in order to achieve such a paradigm shift, buy-in from the different provider groups, particularly primary care, is necessary. Those same providers whose caseloads are overwhelming them, sometimes have difficulty seeing the utility of a program like the DIGMA. As such, it was and continues to be an enormous challenge to generate momentum for this program. At various points in its development there were barriers to be surmounted. One of which was lack of consistent referrals from primary care. Another barrier related to ownership of the program and disagreement about how the interface between providers and participants should occur.

Several conversations between primary care providers and the DIGMA team often resulted in a feeling of deflation on the part of the researchers. It was clear through the course of this research that while primary care reaped the benefits of this study, both in terms of productivity and from the perspective of administrative compliance, the expectation was that behavioral health would bear lion's share of the burden for maintaining the program. There were many instances throughout the project in which it was unclear whether it would be feasible to continue, as providers became preoccupied with other tasks and would fail to show up to DIGMA meetings.

Recruitment and preparation for the DIGMA required a considerable amount of effort on the part of the researchers. The researchers were not compensated for the time spent on the DIGMA. In order for a program like the DIGMA to succeed, the systems

that wish to implement such a program will need to allocate funds so that it can be sustained for an enduring period.

Funding was only one of several challenges to conducting research of this type. Group dynamics certainly apply in a DIGMA. A mix of personalities can create a new experience every week. For this reason no single DIGMA will look identical to another. This fact makes it difficult to package a DIGMA protocol to be used in distinct settings. The population and resources available in a given setting are integral to the shape a DIGMA can take. Further, the dynamic nature of a group makes them difficult to measure as a stable variable. The combination of these factors made researching the DIGMA a challenge.

Another dynamic variable is the individual participant. The DIGMA requires action on the part of the patient. The patient must make decisions about how to alter behavior to achieve desired health responses. It is possible that the acute care model might achieve better initial results in the management of HTN due to reduced reliance on patient activity (O'Donahue, Naylor & Cummings, 2005). But as we have seen, patients seem very positive about this program and actual results indicated that this cognitive behavioral intervention addressed HTN management problems beyond the scope of the medication regimens already in place.

As noted before, the DIGMA may introduce a paradigm shift. The shift being suggested is not limited to the practices and beliefs of the providers. It also asks the patient to view health differently and interact differently with their providers. Active health management and collaboration is asked of the patient rather than passive

compliance, or noncompliance, which tends to be more common in the current paradigm (Blount, 2003).

Surprisingly, one of the bigger challenges was not presented by methodological issues. Somewhat late in the process, the VA's Institutional Review Board conducted an audit of our study. It was determined that we were no longer in compliance and our study was halted for a period of one month. To regain compliance we re-consented each participant of the study, including graduates and dropouts. 73 men from 7 distinct DIGMA cohorts spanning from August 2006 through February 2007 were sought out for the re-consenting process. This proved challenging as it was difficult to locate many of the former participants. However, due in large part to the goodwill generated by the researchers, former participants were amenable to signing the consent forms a second time so that we could proceed with our work. In the end, we re-consented 100% of our original sample so that we did not have to remove any one from our final dataset.

Integrating the services of primary care and behavioral health is a relatively novel concept that has been attempted with some success in various settings (Noffsinger, 1999; Blount, 2003; Westheimer et al., 2005; Westheimer et al., in press). The DIGMA is an attempt to provide a service to patients that increases their exposure to health knowledge without requiring additional resources from the healthcare system. It is hoped that this program can be an example of successful integration of services, treating the mind and body as one, as Engel (1977) might have envisioned.

Limitations

Lack of a true control group makes it difficult to generalize the findings of this study to a larger patient population. Also, limited time and resources made it a challenge to carry the study through for an additional 6 months, which may have impacted the findings as the sample would have been larger and perhaps more powerful. On a related note, lack of time and resources also made a longer-term follow up impossible. Such information would have added strength to the findings in this study.

Also, while it is clear that the vast majority of our subjects were on antihypertensive medication, the ability to control for medication would be intriguing. This improvement could take the form of controlling for medication adherence or type of medication. Also, since many of our subjects have comorbid health and mental health concerns, it is difficult to isolate the impacts of these other conditions from a symptomatic standpoint as well as a pharmacologic treatment standpoint.

Another limitation relates to the challenge of measuring the DIGMA as a stable variable. Due to the ever-changing factor of the participants themselves, it was challenging to create the exact same environment and cover the exact same topics each month. While we attempted to adhere to guiding principles for this program, we had to be open to improvise at times. Often, different groups of participants would want to focus on different concerns than the previous cohort.

Also, because of inconsistency in provider attendance, it was difficult to create the same experience each week. For example, different pharmacists would attend the medication adherence portion of the program, sometimes staying throughout the session and participating as an active group member while other times a different pharmacist

would come and present a 15 minute talk about the importance of medication adherence, not engaging in the group process. Primary care was often overwhelmed and occasionally would show up late. At times it was necessary to search for a nurse who had time to come check blood pressure. These limitations are certainly a result of an overtaxed primary care system. One of the goals of the DIGMA is to reduce this burden.

Also, as a result of the recruitment process, patients essentially self-selected for participation in a group treatment modality. This presupposes that these individuals would be relatively comfortable in such a setting. It was clear that there were some individuals who were not interested in meeting and addressing their health in this way. Those individuals usually opted not to participate in the program. As such, the DIGMA may not be efficacious for everyone suffering from HTN. If an individual struggles in social settings, the likelihood is that a DIGMA might elevate stress and worsen their condition rather than improve it. Therefore, some degree of comfort in social situations may be associated with positive experiences with programs like the DIGMA.

Another limitation is presented by the all male sample. While women are joining the veteran population in large numbers, we found that the majority of our initial referrals were male. It was then decided that we should limit the study to men. It would therefore be difficult to generalize to the entire veteran population without having accounted for the experiences of women.

An additional limitation is presented by the lack of causality between DIGMA attendance and reduced blood pressure. It is possible that, for this variable, the effect of the DIGMA was to reduce the incidence of 'white coat syndrome,' where patients experience stress and thus increased blood pressure upon interacting with health

providers. The DIGMA may have generated more comfort for participants as they face medical providers. The methods of this study do not allow a causal relationship to be drawn here.

Another limitation to our measurement was the reliance upon self report inventories. The potential for presenting something other than the objective truth is certainly possible here. The ability to add an observational component would potentially mitigate the flaws of self-report. Also, blood pressure in the clinical setting may have its own detractors. As above with 'white coat syndrome,' participants may display a more accurate blood pressure reading if measured during their everyday routine.

The qualitative aspects of this study also had limitations. Further development of interview questions could have aided in the tracking of responses along the stages of change (Prochaska & Norcross, 2001) continuum.

Implications for Future Research

Future research in this area may involve an exploration into the various systemic barriers to broader implementation of programs such as the DIGMA. Though no formal study was undertaken on this topic, it was clear that the process of recruiting and referral of patients for the DIGMA relied heavily upon the interest of primary care. In fact, with complete buy-in from primary care, the recruitment process would have been fairly seamless.

Also, a group intervention like the DIGMA may also be useful for other chronic ailments. Examples of these are diabetes and heart disease. Both of which are often comorbid with HTN.

Findings regarding HTN prevalence among different age groups and women (JNC, 2003; Staessen et al., 1989) are intriguing and certainly warrant further exploration. Providing a DIGMA that either includes women or is designed specifically for women could add some useful information in this area. We have seen changes in the interpersonal relations subscale with men; it would be interesting to examine how women react to the program in this regard. Similarly, marital status may have had an impact upon our findings. Controlling for these may yield some interesting results. On a related note, additional measures of interest would be useful. Social support came up frequently in the group sessions. This construct has been found to be associated with self-efficacy (Major et al., 1990). Measuring social support might shed some light on additional factors in the management of HTN.

Hypertension is also known to have high prevalence among African Americans and Hispanics (JNC, 2003). Questions about genetic predisposition could be answered with more pointed research focusing on race and ethnicity.

The addition of a DIGMA booster session with follow up measures would have the utility of keeping longer-term track of participants and their functioning. This would allow researchers to draw further conclusions about the efficacy of this program.

Also, the inclusion of a wait-list control group would improve the methodology of studies of this sort. For example, a control group which receives only the literature provided to the treatment group but does not meet in the group setting would allow inferences to be made regarding the efficacy of the group itself.

In reference to the limitation regarding the relationship between reduced blood pressure and DIGMA participation, additional readings of ambulatory blood pressure

could be included. Ambulatory blood pressure is measured by the patient. He can measure it when he is comfortable. One possible drawback to this technique is the lack of a standard measurement.

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

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

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

High saturated fat foods:	**Low saturated fat foods:**
Red meats	Fish
Creamy dressings	Skinless poultry
Whole milk	Low-fat dairy
Gravies	Skim milk
Cream	Breads
Fast foods	Cereals
Butter	Fruits
Desserts	Vegetables
Cheese	Nonfat or low fat options
Dried foods	

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
4Sometimes
5 Never

15. Indicate your approximate resting heart rate:

1 Below 60 bpm
2 60- 69bpm
3 70 -79 bpm
4 80- 89bpm
5 90 -99bpm
6 100 bpm and Above
7 Do not know

16. Indicate your approximate resting blood pressure:

1 Below 120/80
2 120/80 - 129/84
3 130/85 - 139/89
4 140/90 - 159/109
5 160/100 -169/109
6 170/110 and Above
7 Do not know

17. Indicate your approximate Total cholesterol level:

1 Below 200 mg/dl
2 200 - 239 mg/dl
3 240 mg/dl and above
4 Do not know

18. Indicate your approximate LDL cholesterol level:

1 Below 130 mg/dl
2 130 - 159 mg/dl
3 160 mg/dl and above
4 Do not know

19. Indicate your approximate HDL cholesterol level:

1 Below 35 mg/dl
2 35mg/dl-59 mg/dl
3 60mg/dl and above
4 Do not know

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

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

21. Indicate how often you have <u>historically</u> 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

22. Have you exercised/engaged in any physical activity today?

1 Yes

2 No

*If Yes, Please briefly describe the type, intensity, and duration of the exercise/physical activity:

_____

_____

23. 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:

_____

_____

24. Do you have any <u>current</u> 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:

_____

_____

25. Do you have any <u>past</u> 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:

_____

_____

26. Do you have any <u>current</u> 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:

_____

_____

27. Do you have any <u>past</u> 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:

_____

_____

28. 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

29. Indicate how often you take naps during the late morning or afternoon:

1 Daily
2 Almost every day
3 Several times week
4 Once a week
5 I do not take naps

30. Please list all medications you are currently taking, and briefly state the reason(s):

**Check PRN next to any medications that you do not take regularly.*

Medication	(PRN)	Explanation
_____	(_____)	_____
_____	(_____)	_____
_____	(_____)	_____
_____	(_____)	_____
_____	(_____)	_____
_____	(_____)	_____
_____	(_____)	_____

31. Indicate your smoking status:

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

32. 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

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

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

34. 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

35. Indicate the frequency of current alcohol (12 oz beer=4 oz wine=l 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

36. Approximate the frequency of alcohol (12 oz beer=4 oz wine=l 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

37. 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

HYPERTENSION SELF-EFFICACY – HYPSE

(HypSE)

People with hypertension are often called upon to do many things to take care of themselves and manage their disease. We are interested in knowing how confident you are in your ability to do these things.

Instructions: Please rate your confidence with knowing or acting on each of the following statements by circling the correct number.

Not at all confident 1	Somewhat confident 2	Moderately confident 3	Very confident 4	Completely confident 5

How confident are you that you know…

1. When you should call or visit your doctor about your hypertension.	1 2 3 4 5
2. How to make your doctor understand your concerns about hypertension.	1 2 3 4 5
3. How to take your blood pressure medications.	1 2 3 4 5
4. How much physical activity is good for you.	1 2 3 4 5

How confident are you that you canÉ

5. Control your blood pressure by changing your activity levels.	1 2 3 4 5
6. Monitor blood pressure and understand its implications.	1 2 3 4 5
7. Control your blood pressure by taking your medications.	1 2 3 4 5
8. Lose weight (if you are overweight).	1 2 3 4 5
9. Maintain your usual social activities.	1 2 3 4 5
10. Maintain your usual activities at home with your family.	1 2 3 4 5
11. Maintain your sexual activity.	1 2 3 4 5
12. Get regular aerobic exercise (work up a sweat and increase your heart rate).	1 2 3 4 5
13. Change your diet (if your doctor recommended this).	1 2 3 4 5

Appendix C

HEALTH PROMOTING LIFESTYLE PROFILE II - HPLP II

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:

N for never, **S** for sometimes, **O** for often, or **R** for routinely.

1. Discuss my problems and concerns with people close to me.
2. Choose a diet low in fat, saturated fat, and cholesterol.
3. Report any unusual signs or symptoms to a physician or other health professional.
4. Follow a planned exercise program.
5. Get enough sleep.
6. Feel I am growing and changing in positive ways.
7. Praise other people easily for their achievements.
8. Limit use of sugars and food containing sugar (sweets).
9. Read or watch TV programs about improving health.
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).
11. Take some time for relaxation each day.
12. Believe that my life has a purpose.
13. Maintain meaningful and fulfilling relationships with others.
14. Eat 6 – 11 servings of bread, cereal, rice, and pasta each day.
15. Question health professionals in order to understand their instructions.
16. Take part in light to moderate physical activity (such as sustained walking 30 – 40 minutes 5 or more times per week).
17. Accept those things in my life which I cannot change.

18. Look forward to the future.

19. Spend time with close friends.

20. Eat 2 – 4 servings of fruit each day.

21. Get a second option when I question my health care provider's advice.
22. Take part in leisure-time (recreational) physical activities (such as swimming, dancing, bicycling).

23. Concentrate on pleasant thoughts at bedtime.

24. Feel content and at peace with myself.

25. Find it easy to show concern, love, and warmth to others.

26. Eat 3 – 5 servings of vegetables each day.

27. Discuss my health care concerns with health professionals.

28. Do stretching exercises at least three times a week.

29. Use specific methods to control my stress.

30. Work toward long-term goals in my life.

31. Touch and am touched by people I care about.

32. Eat 2 – 3 serving of milk, yogurt, or cheese each day.

33. Inspect my body at least monthly for physical changes/danger signs.

34. Get exercise during usual daily activities (such as walking during lunch, using stairs instead of elevators, parking far away from destination and walking).

35. Balance time between work and play.

36. Fine each day interesting and challenging.

37. Find ways to meet my needs for intimacy.

38. Eat only 2 – 3 servings from the meat, poultry, fish, dried beans, eggs, and nuts group each day.

39. Ask for information from health professionals about how to take good care of myself.

40. Check my pulse rate when exercising.

41. Practice relaxation or meditation for 15 – 20 minutes daily.

42. Am aware of what is important to me in life.

43. Get support from a network of caring people.

44. Read labels to identify nutrients, fats, and sodium content in packaged food.
45. Attend educational programs on personal health care.

46. Reach my target heart rate when exercising.

47. Pace myself to prevent tiredness.

48. Feel connected with some force greater than myself.

49. Settle conflicts with others through discussion and compromise.

50. Eat breakfast.

51. Seek guidance or counseling when necessary.

52. Expose myself to new experiences and challenges.

Appendix D

MULTIDIMENSIONAL HEALTH LOCUS OF CONTROL FORM C – MHLC FORM C

MHLC: Form C

Instructions: Each item below is a belief statement about your hypertension with which you may agree or disagree. Beside each statement is a scale which ranges from strongly disagree (1) to strongly agree (6). For each item we would like you to circle the number that represents the extent to which you agree or disagree with that statement. The more you agree with a statement, the higher will be the number you circle. The more you disagree with a statement, the lower will be the number you circle. Please make sure that you answer **EVERY ITEM** and that you circle **ONLY ONE** number per item. This is a measure of your personal beliefs; obviously, there are no right or wrong answers.

1=STRONGLY DISAGREE **(SD)**
2=MODERATELY DISAGREE **(MD)**
3=SLIGHTLY DISAGREE **(D)**
4=SLIGHTLY AGREE **(A)**
5=MODERATELY AGREE **(MA)**
6=STRONGLY AGREE **(SA)**

		SD	MD	D	A	MA	SA
1	If my hypertension worsens, it is my own behavior which determines how soon I will feel better again.	1	2	3	4	5	6
2	As to my hypertension, what will be will be.	1	2	3	4	5	6
3	If I see my doctor regularly, I am less likely to have problems with my hypertension.	1	2	3	4	5	6
4	Most things that affect my hypertension happen to me by chance.	1	2	3	4	5	6
5	Whenever my hypertension worsens, I should consult a medically trained professional.	1	2	3	4	5	6
6	I am directly responsible for my hypertension getting better or worse.	1	2	3	4	5	6
7	Other people play a big role in whether my hypertension improves, stays the	1	2	3	4	5	6

	same, or gets worse.						
8	Whatever goes wrong with my hypertension is my own fault.	1	2	3	4	5	6
9	Luck plays a big part in determining how my hypertension improves.	1	2	3	4	5	6
10	In order for my hypertension to improve, it is up to other people to see that the right things happen.	1	2	3	4	5	6
11	Whatever improvement occurs with my hypertension is largely a matter of good fortune.	1	2	3	4	5	6
12	The main thing which affects my hypertension is what I myself do.	1	2	3	4	5	6
13	I deserve the credit when my hypertension improves and the blame when it gets worse.	1	2	3	4	5	6
14	Following doctor's orders to the letter is the best way to keep my hypertension from getting any worse.	1	2	3	4	5	6
15	If my hypertension worsens, it's a matter of fate.	1	2	3	4	5	6
16	If I am lucky, my hypertension will get better.	1	2	3	4	5	6
17	If my hypertension takes a turn for the worse, it is because I have not been taking proper care of myself.	1	2	3	4	5	6
18	The type of help I receive from other people determines how soon my hypertension improves.	1	2	3	4	5	6

Appendix E

TELEPHONE INTERVIEW - GRADUATES

1. Thinking back over the past month, please talk about any changes you have made to your routine.
    a. Probe A - This might include eating habits, exercise, dealing with stress
    b. Probe B – To what or whom do you attribute these changes (if any)?
2. How have your views of personal control over health issues changed, if at all?
    a. Probe – Talk about any changes in the way you think about your primary care provider.
3. How capable are you of handling your own health problems?
    a. Probe A– this might include changing your activities or diet as well as seeking help from professionals.
    b. Probe B – Is this a change for you over the past month?
4. What was your experience of the DIGMA program like?
    a. Probe A - In your recollection, what were the most positive aspects of the DIGMA program?
    b. 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.
    a. Probe A – Did the DIGMA not appear to meet your needs?
2. What was your experience of the DIGMA program like?
    a. Probe A - In your recollection, what were the most positive aspects of the DIGMA program?
    b. Probe B – What were some of its shortcomings? Or what could be added to improve the program?
3. Would you be willing to reenroll?

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VITA

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